FIVE ESTUARIES OFFSHORE WIND FARM

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

VOLUME 4, ANNEX 5.2: EXPORT CABLE ROUTE AND INTERTIDAL BENTHIC ECOLOGY MONITORING REPORT

Document Reference	004685533-01
Revision	A
Date	May 2022

Project	Five Estuaries Offshore Wind Farm
Sub-Project or Package	Preliminary Environmental Information Report
Document Title	Volume 4, Annex 5.2: Export Cable Route and Intertidal Benthic Ecology Monitoring Report
Document Reference	004685533-01
Revision	A

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	May-22	Final for PEIR	Fugro	GoBe	VE OWFL

Fugro – WPM2, WPM3 & WPM4 – ECR & Intertidal – Benthic Ecology Monitoring Report

Five Estuaries Offshore Site Investigation | UK Sector, North Sea

004032872 03 | 11 May 2022

Complete

Five Estuaries Offshore Wind Farm Limited

Document Control

Document Information

Project Title	Five Estuaries Offshore Site Investigation
Document Title	Fugro – WPM2, WPM3 & WPM4 – ECR & Intertidal – Benthic Ecology Monitoring Report
Fugro Project No.	200867
Client Document No.	004032872
Issue Number	03
Issue Status	Complete

Client Information

Client	Five Estuaries Offshore Wind Farm Limited
Client Address	Windmill Hill Business Park, Swindon, SN5 6PB
Client Contact	Mark Osola
Client Document No.	004032872_03

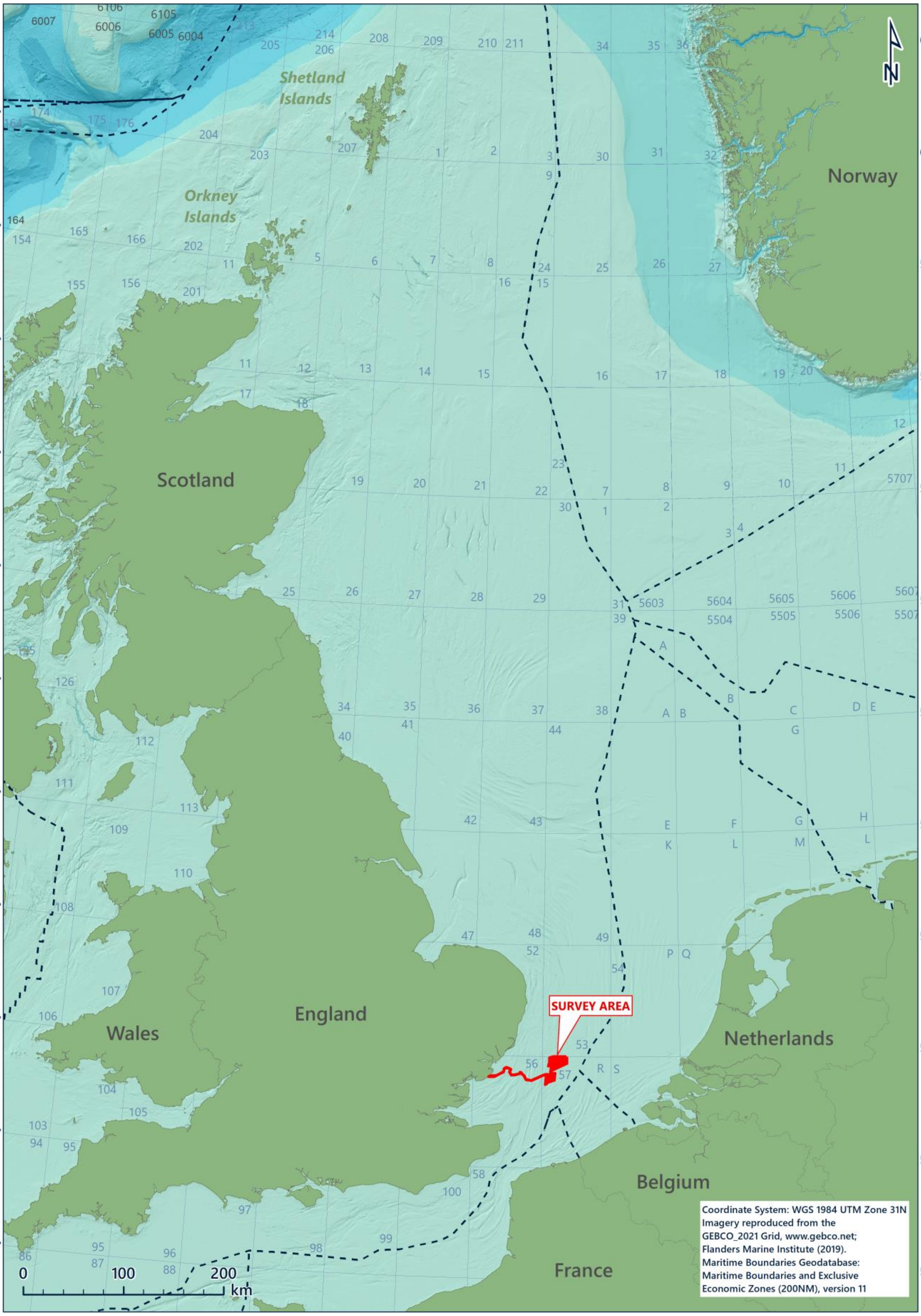
Revision History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Approved By
01	2 March 2022	Complete	Awaiting client comments	SDG	SGW/SXB	SGW
02	5 April 2022	Complete	Issued to client	SDG	SGW	SGW
03	11 May 2022	Complete	Issued as complete	SDG	SGW	SGW

Project Team

Initials	Name	Role
SGW	Séamus Whyte	Senior Project Manager
SDG	Stefania De Gregorio	Principal Marine Ecologist
SXB	Susan Brittain	Principal Chemist (Inorganics Lead)

Frontispiece



Executive Summary

Introduction

Five Estuaries Offshore Wind Farm Limited contracted Fugro to undertake a benthic site characterisation survey at the Five Estuaries Offshore Wind Farm (VE) development area. The VE comprises a main array area (north and south arrays with an interconnector in between) and an export cable route (ECR) that will run from the offshore array to the landing site. Operations were conducted onboard the MV Marshall Art during the survey period 9 to 16 November 2021. An intertidal survey at the cable landing site, between Holland-on-Sea and Frinton-on-Sea, Essex, was undertaken during the survey period 25 to 27 July 2021.

The results of the study will inform the project final development consent order (DCO) application, the environmental impact assessment (EIA) and the habitats regulation assessment (HRA).

The aim of the benthic surveys was to provide a baseline characterisation of the benthic ecology and to supplement the existing data across the area of interest. The aim was fulfilled through acquisition of sediment samples and seabed video and photographic data. Sediment samples were acquired to characterise the benthic environment in terms of physico-chemical features and biological communities. Seabed video and photographic data provided information on habitat types, with focus on habitats of conservation importance, such as those listed under Annex I of the Conservation of Habitats and Species Regulations 2019 and on the Oslo and Paris (OSPAR) list of threatened and/or declining habitats and species. The results of the seabed video and photographic data were integrated with those from the grab samples to further define the habitats and associated biological communities in terms of biotopes in line with the European Nature Information System (EUNIS) habitat classification.

This report presents the results of data acquired across the intertidal survey area and along the ECR.

Survey Strategy

Intertidal

A modified Phase I walkover habitat mapping survey was conducted to record intertidal habitats and associated fauna and flora to provide information on habitat composition and distribution. The entire vertical profile of the shore was investigated, from the supralittoral zone to the low water spring tide level (subject to safe access), as identified by standard Admiralty tidal predictions.

Eight transects, perpendicular to the shoreline, were selected across the intertidal survey area, following Phase I habitat mapping survey. Samples for macrofaunal and particle size distribution (PSD) analysis were proposed at high, mid and low water locations along each transect. Along transect I_TR06, sampling locations were established at mid and low water, owing to the presence of rock armour at high water. Samples for chemistry analysis were proposed along transect I_TR05, which was selected during the survey operations to ensure targeting of finer sediments. Samples were acquired using a 11.2 cm diameter (0.01 m^2) stainless steel corer pushed into the sediment to a depth of 15 cm. Sediment redox measurement were taken where possible.

Export Cable Route

Forty-seven environmental sampling stations, to be assessed through drop-down camera and single replicate grab samples, were proposed based on review of available regional and geophysical data. Review of side scan sonar (SSS) data placed emphasis on areas of potential conservation value, boundaries between areas of differing sonic reflectivity, bathymetric highs and lows and areas representative of the general background conditions of the site. Acquisition of grab samples for chemistry analysis was proposed at nine stations. Seabed video and photography were acquired prior to grab sampling to ensure no damage to potential habitats of conservation importance. Five drop-down video (DDV) samples were proposed to target areas of hard/coarse substrates and twelve DDV transects were proposed in areas of potential conservation importance, referred to as 'areas of focus'.

Seabed video and photography were acquired using a Subsea Technology and Rentals (STR) deep-sea camera system. In areas of poor visibility, seabed video and photography were acquired using a Bowtech SeaKnight underwater camera system mounted within a freshwater frame.

Faunal and sediment PSD samples were acquired using a 0.1 m^2 mini Hamon grab, whereas chemistry samples were acquired using a 0.1 m^2 Day grab.

Of the 47 stations proposed for faunal and sediment PSD analysis, 44 were successfully sampled. Of the nine stations proposed for chemistry analysis samples, seven were successfully sampled. Three stations were not sampled for faunal and PSD analysis, and one was not sampled for chemistry analysis, owing to the coarseness of the substrate. One station was relocated by 50 m to allow acquisition of a sediment sample for chemistry analysis.

The ECR survey area comprised four survey blocks denoted with the prefixes FE4 to FE7 from the offshore to the nearshore sections, respectively.

Sediment Characteristics

Intertidal

The intertidal survey area comprised coarse sediments represented by sand and gravel, the latter accounting for higher percentages at high water and mid water stations compared to low water stations. Fines were absent from the intertidal survey area, most likely owing to the local hydrodynamics.

Using the Wentworth (1922) scale, five categories of sediments were described, including 'medium sand', 'coarse sand', 'very coarse sand', 'granule' and 'pebble', of which 'medium 'sand' and 'coarse sand' described most stations. Three sediment classes were identified through the Folk (BGS modified) classification, including 'sand', which typified most stations, 'gravelly sand' and 'sandy gravel'.

In general, the coarseness of the sediment decreased towards low water, where the sediment was less heterogeneous compared to that at high water. This was reflected in a decrease of the sediment sorting and sediment classes at low shore.

Export Cable Route

Sediments along the ECR comprised a mix of gravel, sand and fines, the latter being recorded at 41 stations. A notable contribution to gravel emanated from shell fragments, as recorded from the qualitative description of the grab samples. The heterogeneity of the sediment was reflected in the sediment sorting which ranged from well sorted to extremely poorly sorted, with most stations having very poorly sorted sediments.

The sediment diversity resulted in ten sediment classes being identified through the Folk (British Geological Survey [BGS] modified) classification, of which 'muddy sandy gravel' typified most stations, whereas 'sand' and 'gravel' each typified one station. The remaining stations were classified as 'sandy gravel', 'gravelly mud', 'gravelly muddy sand', 'gravelly sand', 'muddy gravel', 'muddy sand' and 'sandy mud' depending on the percentages of the main sediment fractions.

The Wentworth (1922) scale was used to assess the coarseness of the sediment resulting in ten sediment descriptions, including 'fine silt', 'medium silt', 'coarse silt', 'very fine sand', 'fine sand' 'medium sand', 'coarse sand', 'very coarse sand', 'granule' and 'pebble'. Of these, eight descriptions were represented in block FE7, along the nearshore section of the ECR, and four described block FE6 in the central section of the ECR.

Most stations had bimodal or polymodal distributions, typical of areas with different sources of sediment, likely associated with riverine input and sediment disturbance in a high energy environment, such as that of the study area.

Sediment Chemistry

Sediment samples were analysed for total hydrocarbon content (THC), polycyclic aromatic hydrocarbons (PAHs), metal content, polychlorinated biphenyls (PCBs), organotins, and organochlorine pesticides (OCPs). Twenty-two PAHs were analysed, including the United States Environmental Protection Agency (US EPA) 16 PAHs, selected alkyl naphthalenes and phenanthrenes, benzo[e]pyrene and perylene.

Results were compared against marine sediment quality guidelines (SQGs) including the OSPAR effects range low (ERL), the National Oceanic and Atmospheric Administration (NOAA) effects range median (ERM), the Centre for Environment, Fisheries and Aquaculture Science (Cefas) Guideline Action Levels (ALs) and the Canadian threshold effect level (TEL) and probable effect level (PEL).

The concentrations of THC and PAHs were below their respective marine SQGs across the intertidal survey area and along the ECR. Regional contextualisation of the results indicated that concentrations of PAHs were generally higher than those reported for the Outer Thames Estuary, most likely due to sedimentary differences.

Concentrations of all 11 metals analysed were below their respective marine SQGs across the intertidal survey area. Along the ECR, arsenic and nickel concentrations were above their respective Cefas AL1 at stations FE4_02_50 m, FE4_05 and FE5_09 along the offshore section of the ECR, and station FE7b_04 along the nearshore section of the ECR.

At station FE4_02_50 m, the arsenic concentration was also above the Canadian PEL and the CEMP ERM, whereas at station FE5_09, the arsenic concentration was also above the Canadian PEL. Concentrations of arsenic were above the Canadian TEL at all stations along the ECR, whereas copper was above the Canadian TEL at two stations.

At stations FE4_02_50 m, FE5_09 and FE7b_04, nickel concentrations were also above the CEMP ERM.

Cadmium and chromium concentrations were above their respective Cefas AL1 at station FE4_05 and FE5_09, respectively.

Regional contextualisation of the results indicated that concentrations of arsenic, nickel, cadmium and chromium are within the range reported for the Outer Thames Estuary.

The concentration of all individual PCB congeners analysed was below the limit of detection (LOD) across the intertidal survey area, whereas along the ECR, the concentration of selected PCB congeners was above the LOD. The sum of the 25 congeners was below the Cefas ALs across the intertidal survey area and along the ECR.

The organotins analysed were dibutyltin (DBT) and tributyltin (TBT), the concentrations of which were below their respective LOD and below the Cefas ALs across the intertidal survey area and along the ECR.

The OCPs analysed in this study were alpha-hexachlorocyclohexane (AHCH), beta-hexachlorocyclohexane (BHCH), gamma-hexachlorocyclohexane (GHCH), dieldrin, hexachlorobenzene (HCB), p,p'-dichlorodiphenyldichloroethylene (PPTDE), p,p' dichlorodiphenyltrichloroethane (PPDDT) and p,p'-dichlorodiphenyldichloroethane (PPDDE). All OCPs across the intertidal survey area had concentrations below their respective LOD, whereas along the ECR dieldrin, PPTDE and PPDDE were above their respective limit of LOD at some stations. All values were below the Cefas marine SQGs, which currently include AL1 for dieldrin and DDT.

Macrofauna

Intertidal

The intertidal macrofaunal communities were characterised by low richness and diversity, likely associated with the exposure of the survey area and the coarseness of the sediment which is therefore mobile and does not retain sufficient water between the tides. Thus, only taxa that are capable of withstanding the environmental stresses of long exposure are capable of living in such environment. Taxa recorded in the core samples were represented mainly by Nematoda and Platyhelminthes. Annelida comprised oligochaetes and invertebrates that are typical of shallow estuarine and marine habitats, whereas crustaceans were represented by cumacean and amphipods.

Export Cable Route

The macrofaunal community comprised infaunal and epifaunal taxa, the latter being represented by solitary and colonial organisms. Annelida were dominant in terms of taxa composition and abundance of the enumerated macrofauna, which comprised infauna and solitary epifauna. There was considerable variation in the number of taxa and individuals along the ECR, with stations in survey block FE4 along the offshore section of the ECR, having generally higher number of taxa and abundance, the latter associated with numerical dominance of selected invertebrates, notably *Verruca stroemia* and *Pisidia longicornis*. By comparison, stations in survey block FE6, along the central section of the ECR, had generally low richness and diversity.

Macrofaunal diversity, assessed in line with the threshold values of Dauvin et al. (2012), ranged from bad to high, and was on average high in all survey blocks

Annelida were represented by polychaetes including *Lagis koreni*, *Sabellaria spinulosa*, *Lumbrineris* cf. *cingulata*, *Spirobranchus lamarcki* and *Ampharete lindstroemi*. The polychaete *S. spinulosa* was recorded in grab samples from 23 stations, with abundances of between 1 and 155 individuals per station.

Mollusca were represented by bivalves such as *Nucula nucleus*, *Abra alba Kurtiella bidentata Sphenia binghami* and the chiton *Leptochiton asellus*. Other bivalves with notable abundance included Musculus discors, *Nucula nitidosa* and *Mytilus edulis* although these species had a restricted distribution by comparison, particularly *M. discors*, which was recorded at three stations, with station FE7b_02 having 1376 individuals, which was the highest abundance of any taxa at any one station.

Echinodermata were represented by species typical of habitats exposed to strong tidal currents, typically brittlestars such as *Ophiura albida*, *Ophiothrix fragilis* and *Amphipholis squamata*, and the urchins *Echinocyamus pusillus* and *Psammechinus miliaris*.

Other taxa were represented mainly by species of Ascidiacea, non-burrowing anemones of the order Actiniaria, species of *Phoronis* and Nemertea. Anemones of the family Edwardsiidae and *Cerianthus lloydii* were also recorded although at lower abundances and frequency of occurrence, along with Platyhelminthes, Sipuncula (*Golfingia elongata* and *Golfingia vulgaris*) and Entoprocta (*Loxosoma annelidicola*).

Four macrofaunal assemblages were identified through the multivariate analysis, each assemblage having ≤ 44 % similarity and moderately associated with sediment type.

Annelida comprised most of the infaunal biomass owing to their numerical dominance, followed by the Echinodermata the biomass of which was associated with the abundance of brittlestars as well as the size of invertebrates, notably urchins.

Colonial epifauna included Bryozoa, notably *Escharella immersa*, *Schizomavella*, *Aspidelectra melolontha* and *Conopeum reticulum*; Cnidaria, *Alcyonium digitatum* and species of Sertulariidae; Porifera and ciliates of the family Folliculinidae.

Some of taxa recorded in the grab samples were also recorded through the seabed video and photography, notably *P. miliaris A. digitatum* and calcareous tubes of *Spirobranchus*. Other characteristic epibenthic taxa recorded through the seabed video and photography included molluscs, notably *Calliostoma zizyphinum*, *Calliostoma granulatum*, *Aequipecten opercularis* and species of Buccinidae; echinoderms, notably *Asterias rubens*, and species of Ophiuroidea including *O. fragilis*; anemones, including species of Sagartiidae and *Urticina* and faunal turfs of bryozoans and hydrozoans. Encrusting polychaete tubes and barnacles were also recorded along with fish, albeit less frequently, notably *Scyliorhinus canicula*, and species of the family Gobiidae. Overall, epibiotic communities recorded by the seabed video footage were comparable to those reported for the shallower sediment areas of the southern North Sea.

Habitats and Biotopes

Intertidal

One habitat complex, one habitat, two biotope complexes, eight biotopes and one sub-biotope were identified across the intertidal survey area during the Phase I habitat mapping:

1. 'Littoral rock and other hard substrata' (A.1)
2. '*Verrucaria maura* on very exposed to very sheltered upper littoral fringe rock' (B3.1132)
3. 'Mussel and/or barnacle communities' (A1.11)
4. 'Robust fucoid and/or red seaweed communities' (A1.12)
5. '*Semibalanus balanoides* on exposed to moderately exposed or vertical sheltered eulittoral rock' (A1.113)
6. '*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock' (A1.212)
7. '*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock' (A1.213)
8. '*Fucus serratus* on moderately exposed lower eulittoral rock' (A1.214)
9. '*Enteromorpha* spp. on freshwater-influenced and/or unstable upper eulittoral rock' (A1.451)
10. '*Porphyra purpurea* and *Enteromorpha* spp. on sand-scoured mid or lower eulittoral rock' (A1.452)
11. 'Littoral sand and muddy sand' (A2.2)
12. 'Barren littoral shingle' (A2.111)
13. '*Lanice conchilega* in littoral sand' (A2.245)

The habitats and biotopes identified through the Phase I habitat mapping could not be further redefined following analysis of the core samples, owing to the paucity of fauna.

Export Cable Route

Three biotope complexes and three biotopes were identified along the ECR from the grab samples analysis:

1. 'Circalittoral coarse sediment' (A5.14)
2. 'Circalittoral mixed sediment' (A5.44)
3. 'Circalittoral muddy sand' (A5.26)
4. *'Glycera lapidum* in impoverished infralittoral mobile gravel and sand' (A5.13)
5. *'Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment' (A5.261)
6. 'Polychaete-rich deep *Venus* community in offshore mixed sediments' (A5.451), which is the only biotope representative of the biotope complex 'Offshore circalittoral mixed sediments' (A5.45).

In addition, the biotope 'Piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231), was assigned to areas of firm clay with round burrows of piddocks recorded at station FE4_01, FE4_02 and FE4_03 in survey block FE4, through seabed video and photography.

Potentially Sensitive Habitats and Species

Aggregations of *Sabellaria spinulosa* at one station along the offshore section of the ECR and three stations along the nearshore section, were assessed for the potential of Annex I habitat 'Reef', in line with criteria for the evaluation of biogenic reef. The results of the overall assessment were of 'Not a reef'.

Aggregation of cobbles at four stations along the offshore section of the ECR, were assessed for the potential to constitute Annex I habitat 'Reef', in line with criteria for the evaluation of stony reef. The overall assessment was of 'Not a reef' or 'Low resemblance' to a stony reef and as such, unlikely to represent Annex I habitat under the current marine nature conservation legislation.

Two UK Biodiversity Action Plan (BAP) priority habitats were recorded, namely 'Piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231) and the broad scale habitat (BSH) 'Subtidal sands and gravel", which encompass sandy and coarse sediment habitats and biotopes. 'Subtidal sands and gravel" is also a habitat of conservation importance (HOCI) in Marine Protected Zones (MCZs), whereas 'piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231) may occur in the habitat 'Peat and clay exposure' which is a HOCI in MCZs.

Cryptogenic and Non-native Species (NNS)

Non-native species recorded across the intertidal survey area included the barnacle *Austrominius modestus* and the Pacific oyster *Magallana gigas*.

Non-native species recorded in the grab samples included the slipper limpet *Crepidula fornicata*.

The cryptogenic species recorded in the grab samples included the polychaetes *Aphelochaeta* (formerly *Tharyx*) *marioni* and the crustacean amphipod *Crassicorophium crassicorne*. Ascidians of the family Didemnidae were also recorded and may therefore include cryptogenic species such as *Diplosoma listerianum*.

Contents

Appendices

Figures in the Main Text

Tables in the Main Text

Abbreviations

AFDW	Ash free dry weight
AHCH	Alpha-hexachlorocyclohexane
AL1/AL2	Action Level 1 or 2
BAC	Background assessment concentration
BC	Background concentration
BGS	British Geological Survey
BHCH	Beta hexachlorocyclohexane
BSH	Broad-scale habitat
BIOENV	Biological and Environmental
BRIG	Biodiversity Reporting and Information Group
BS	British Standards
BSL	Below sea level
CBD	Convention on Biological Diversity
CCME	Canadian Council of Ministers of the Environment
Cefas	Centre for Environment, Fisheries and Aquaculture Science

CEMP	Coordinated Environmental Monitoring Programme
CSEMP	Clean Seas Environmental Monitoring Programme
CM	Central meridian
DAISIE	Delivering Alien Invasive Species Inventories for Europe
DBT	Dibutyltin
DCM	Dichloromethane
DCO	Development Consent Order
DDT	Dichlorodiphenyltrichloroethane
DTI	Department of Trade and Industry
DDV	Drop-down video
DVV	Dual van Veen grab
ECR	Export cable route
EEA	European Environment Agency
EIA	Environmental Impact Assessment
EMODnet	European Marine Observation Data Network
EOL	End of line
EPSG	European Petroleum Survey Group
ERL	Effects range low
ERM	Effects range median
EU	European Union
EUNIS	European Nature Information System
FA	Faunal sample A
FOCI	Feature of Conservation Importance
GC	Gas chromatography
GHCH	Gamma-hexachlorocyclohexane
GC-MS	Gas chromatography – mass spectrometry
GC-Ms-MS	Gas chromatography coupled to a triple quadruple mass spectrometer
GPS	Global Positioning System
HCH	Hexachlorocyclohexane
HOCI	Habitat of Conservation Importance
HRA	Habitat Regulation Assessment
ICES	International Council for the Exploration of the Sea
ICP-MS	Inductively coupled plasma-mass spectrometry
ICP-OES	Inductively coupled plasma-optical emission spectrometry
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LED	Light-emitting diode
LOD	Limit of detection
MBES	Multibeam echosounder
MCZ	Marine Conservation Zone
MERMAN	Marine Environment Monitoring and Assessment National (database)
MALSF	Marine Aggregate Levy Sustainability Fund
MMO	Marine Management Organisation
MNCR	Marine Nature Conservation Review
MPA	Marine Protected Area
MV	Motor vessel
NBN	National Biodiversity Network

NEMESIS	National Exotic Marine and Estuarine Species Information System
NERC	Natural Environment and Rural Communities
NF	No fix
NMBAQC	North East Marine Biological Association Quality Control
NNS	Non-native species
NNSS	Non-native Species Secretariat
nMDS	Non-metric multi-dimensional scaling
NOAA	National Oceanic and Atmospheric Administration
NS	No sample
NSTF	North Sea Task Force
OCP	Organochlorine pesticide
OSPAR	Oslo and Paris Commission
OWF	Offshore Wind Farm
PAH	Polycyclic aromatic hydrocarbon
PC	Physico-chemical sample
PCA	Principal component analysis
PEL	Probable effects level
PPDDE	p,p' dichlorodiphenyltrichloroethane
PPDDT	p,p'-dichlorodiphenyldichloroethane
PRIMER	Plymouth Routines in Multivariate Ecological Research
PSA	Particle size analysis
PSD	Particle size distribution
PVC	Polyvinyl chloride
RSD	Relative standard deviation
SAC	Special Area of Conservation
SBP	Sub-bottom profiler
SDC	Species Directory Code
SIMPER	Similarity percentage (analysis)
SIMPROF	Similarity Profile
SOL	Start of line
SPA	Special Protection Area
SQG	Sediment quality guideline
SSS	Side scan sonar
SSSI	Site of Special Scientific Interest
STR	Subsea Technology and Rentals
TBT	Tributyltin
TEL	Threshold effects level
THC	Total hydrocarbon content
UKAS	United Kingdom Accreditation Service
UK BAP	UK Biodiversity Action Plan
US EPA	Unites States Environmental Protection Agency
US EPA 16	United States Environmental Protection Agency's 16 priority PAH pollutants
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator
VE	Five Estuaries Offshore Windfarm
VHF	Very high frequency
WGS 84	World Geodetic System 1984
WoRMS	World Register of Marine Species

Document Arrangement

Fugro - Mobilisation and Calibration Report - Fugro Mercator
Fugro - Mobilisation and Calibration Report - Fugro Seeker
Fugro – Mobilisation and Calibration Report – Marshall Art
Fugro - WPM1 & WPM2 - Acquisition / Operations Report - Fugro Mercator
Fugro - WPM3 - Acquisition / Operations Report - Fugro Seeker
Fugro - WPM1, WPM2 & WPM3 - Acquisition / Operations Report - Marshall Art
Fugro - WPM1 & WPM2 - Processing Report - Fugro Mercator
Fugro - WPM3 - Processing Report - Fugro Seeker
Fugro - WPM1 - Main Array - Seafloor and Shallow Geological Results Report
Fugro - WPM2 & WPM3 - ECR - Seafloor and Shallow Geological Results Report
Fugro - WPM1, WPM2 & WPM3 - Main Array & ECR - Environmental Features Report
Fugro - WPM1 - Main Array - Benthic Ecology Monitoring Report
Fugro – WPM2, WPM3 & WPM4 – ECR & Intertidal - Benthic Ecology Monitoring Report

1. Introduction

1.1 General Project Description

Five Estuaries Offshore Wind Farm Limited contracted Fugro to undertake a benthic site characterisation survey for the development of the Five Estuaries Offshore Wind Farm (VE). Operations were conducted onboard the MV Marshall Art during the survey period 9 to 16 November 2021.

An intertidal survey of the cable landing site, between Holland-on-Sea and Frinton-on-Sea, Essex, was undertaken during the survey period 25 to 27 July 2021.

Five Estuaries Offshore Wind Farm Limited intend to apply for development consent of the VE, in the southern North Sea, off the coast of Suffolk adjacent to the existing Galloper Offshore Wind Farm (OWF). The VE will cover an area of approximately 148.95 km^2 across two areas (north and south arrays) and an inter-array area (interconnector) for a possible cable connection between the two arrays. Water depths in the VE area range from 35 m to 50 m Lowest Astronomical Tide (LAT). An export cable route (ECR) will run from the offshore arrays to the landing site.

As part of the Development Consent Order (DCO) application to the Planning Inspectorate, an offshore site investigation is necessary to collect baseline characterisation data, which will be used to inform the environmental impact assessment (EIA) and the habitats regulation assessment (HRA).

The benthic study included geophysical and environmental surveys, the latter comprising a habitat assessment and a benthic characterisation survey. The Environmental Features Report (Fugro 2022a) details the results of the habitat assessment.

This report details the results of the baseline benthic characterisation survey across the intertidal area and along the ECR.

Results of data acquired across the VE main array survey area are presented in the main array benthic ecology monitoring report (Fugro, in press).

Appendix A outlines the guidelines for use of this report.

1.2 Scope of Work

The aim of the intertidal survey was to investigate the habitats across the landfall section of the ECR and adjacent areas, with particular focus on habitats and species of conservation importance and potential presence of non-native species (NNS). Results of the core samples provided information on the sediment type and associated faunal communities to better define the biotopes of sedimentary habitats.

The aim of the benthic subtidal survey was to investigate the physico-chemical and biological properties of the sediment to provide a baseline characterisation of the site and to supplement the existing benthic ecology data across the area of interest. The aim of the study was fulfilled through acquisition of seabed video and photographic data and sediment samples. The seabed video and photography allowed evaluation of the habitat types along the ECR, with particular focus on habitats of conservation importance, such as those listed under Annex I of the of the Conservation of Habitats and Species Regulations 2019 and on the Oslo and Paris (OSPAR) list of threatened and/or declining habitats and species (OSPAR, 2021). Sediment samples allowed evaluation of the physico chemical and biological properties of the seabed for the characterisation of the biotic communities and the identification of potential NNS.

1.3 Environmental Legislation

The relevant environmental legislation applying to the study area has been detailed in the Environmental Features Report (Fugro, 2022a) and summarised in Tables 1.1 and 1.2. Together they guided the identification of habitats and species of conservation importance in the study area.

Table 1.1: Marine environmental legislation

Legislation	Key aims
Conservation of Habitats and Species (Amendment (EU Exit) Regulations 2019), referred to as the 2019 Regulations	Transposes the requirements of the European Union (EU) Habitats Directive and some elements of the Wild Birds Directive (together forming the Nature Directives) into UK law; aims at conserving biodiversity through measures for protection of habitats and species, through the establishment of a national site network of protected sites, referred to as Special Areas of Conservation (SACs) and Special Protection Area (SPA)
UK Marine Strategy	Provides a framework for community action in the field of marine environmental policy through three components: 1. assessment of the state of UK seas and revised objectives for good environmental status (GES) for 2018 to 2024; 2. monitoring progress against set targets and indicators; 3. measuring the achievement of GES
Marine and Coastal and Access Act 2009	Enables the designation of Marine Conservation Zones (MCZs) in England, Wales and UK offshore waters
Natural Environment and Rural Communities Act 2006 (NERC)	Requires the relevant Secretary of State to compile a list of habitats and species of principal importance for the conservation of biodiversity.
The Wildlife and Countryside Act 1981 (as amended)	Regulates the designation of Site of Special Scientific Interest (SSSIs), which underpins the designation of Ramsar sites
Oslo and Paris (OSPAR) Convention	Establishes Marine Protected Areas (MPAs)
Convention on Biological Diversity (CBD)	Conservation of biological diversity and sustainable use of its components
Ramsar Convention	Aims at the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development

Table 1.2: Marine protected areas biodiversity features

Biodiversity Features	Description
Broad-scale habitats (BSH)	Represent the main types of seabed and associated biota in UK; their conservation ensures preservation of the full range of marine biodiversity
Features of conservation importance (FOCI)	Represent habitats and/or species that may be highly sensitive to human activities and therefore need protection
UK Post-2010 Biodiversity Framework priority habitats and/or species	List of important (priority) habitats and species, produced by the UK Biodiversity Action Plan (BAP), superseded by the UK Post-2010 Biodiversity Framework, under the Convention on Biological Diversity (CBD). Under the NERC Act 2006, the UK BAP priority species and habitats in England are referred to as habitats and species of principal importance
Oslo and Paris (OSPAR) list of threatened and/or declining (T&D) species and habitats	Allows setting priorities for further conservation and protection of marine biodiversity

1.4 Regional Habitats, Species and Protected Areas

Background regional information on protected marine benthic habitats and species, in relation to the survey area, has been detailed in the Environmental Features Report (Fugro, 2022a), summarised in Table 1.3 and illustrated in Figure 1.1. The survey area also overlaps the southern North Sea Special Area of Conservation (SAC), which is designated for the Harbour porpoise *Phocoena phocoena*, which is an Annex II species. Hamford Water is also designated as SAC for the Fisher's estuarine moth *Gortyna borelii lunata*, which is an Annex II species.

Table 1.3: Summary of nearby protected areas, Five Estuaries Offshore Site Investigation

Protected Area	Status	Distance* [km]	Direction*	Protected Habitats/Species
Margate and Long Sands	SAC	Crossed by export cable route		Annex I habitats ■ Sandbanks which are slightly covered by sea water all the time
Essex Estuaries	SAC	14	SW	Annex I habitats ■ Estuaries ■ Mudflats and sandflats not covered by seawater at low tide ■ *Salicornia* and other annual colonising mud and sand ■ *Spartina* swards (*Spartinion maritimae*) ■ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) ■ Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) ■ Sandbanks which are slightly covered by sea water all the time
Blackwater, Crouch, Roach and Colne Estuaries	MCZ	5.5	SW	UK BAP priority and OSPAR T&D species and habitats ■ Native oyster (*Ostrea edulis*) beds

Protected Area	Status	Distance* [km]	Direction*	Protected Habitats/Species
				■ Native oyster (*Ostrea edulis*) Broad-scale habitat ■ Intertidal mixed sediments
Orford Inshore	MCZ	13	NW	Broad-scale habitat ■ Subtidal mixed sediments
Kentish Knock East	MCZ	8	S	Broad-scale habitats ■ Subtidal coarse sediment ■ Subtidal sand ■ Subtidal mixed sediments
Outer Thames Estuary	SPA	Crossed by export cable route		■ Red-throated diver (Gavia stellata) ■ Common tern (Sterna hirundo) ■ Little tern (*Sternula albifrons*)
Hamford Water	SPA	3	N	■ Avocet (*Recurvirostra avosetta*) ■ Black-tailed godwit (*Limosa limosa islandica*) ■ Dark bellied brent goose (*Branta bernicla bernicla*) ■ Grey plover (*Pluvialis squatarola*) ■ Redshank (*Tringa tetanus*) ■ Ringed plover (*Charadrius hiaticula*) ■ Shelduck (*Tadorna tadorna*) ■ Little tern (*Sternula albifrons*) ■ Teal (*Anas crecca*)
Colne Estuary	SPA	10	SW	■ Little tern (*Sternula albifrons*) ■ Common pochard (*Aythya farina*) ■ Dark bellied brent goose (*Branta bernicla bernicla*) ■ Hen harrier (*Circus cyaneus*) ■ Ringed plover (*Charadrius hiaticula*) ■ Redshank (*Tringa totanus*)
Deben Estuary	SPA	13	N	■ Avocet (*Recurvirostra avosetta*) ■ Dark bellied brent goose (*Branta bernicla bernicla*)
Stour and Orwell Estuaries	SPA	14	W	■ Hen harrier (Circus cyaneus) ■ Black-tailed godwit (Limosa limosa islandica) ■ Dunlin (Calidris alpina alpina) ■ Grey plover (Pluvialis squatarola) ■ Pintail (Anas acuta) ■ Redshank (Tringa totanus) ■ Ringed plover (Charadrius hiaticula) ■ Shelduck (Tadorna tadorna) ■ Turnstone (*Arenaria interpres*)
Alde-Ore Estuary	SPA	14	N	■ Avocet (Recurvirostra avosetta) ■ Lesser black-backed gull ■ (Lucus fuscus) ■ Little tern (Sternula albifrons) ■ Marsh harrier (Circus aeruginosus) ■ Redshank (Tringa totanus) ■ Ruff (Philomachus pugnax) ■ Sandwich Tern (*Sterna sandivicensis*

Protected Area	Status	Distance* [km]	Direction*	Protected Habitats/Species
Notes * = Distance and direction from closest sampling site MCZ = Marine Conservation Zone SAC = Special Area of Conservation SPA = Special Protection Area UK BAP = United Kingdom Biodiversity Action Plan OSPAR T&D = Oslo and Paris List of threatened and/or declining species and habitats SSSI = Site of Special Scientific Interest				

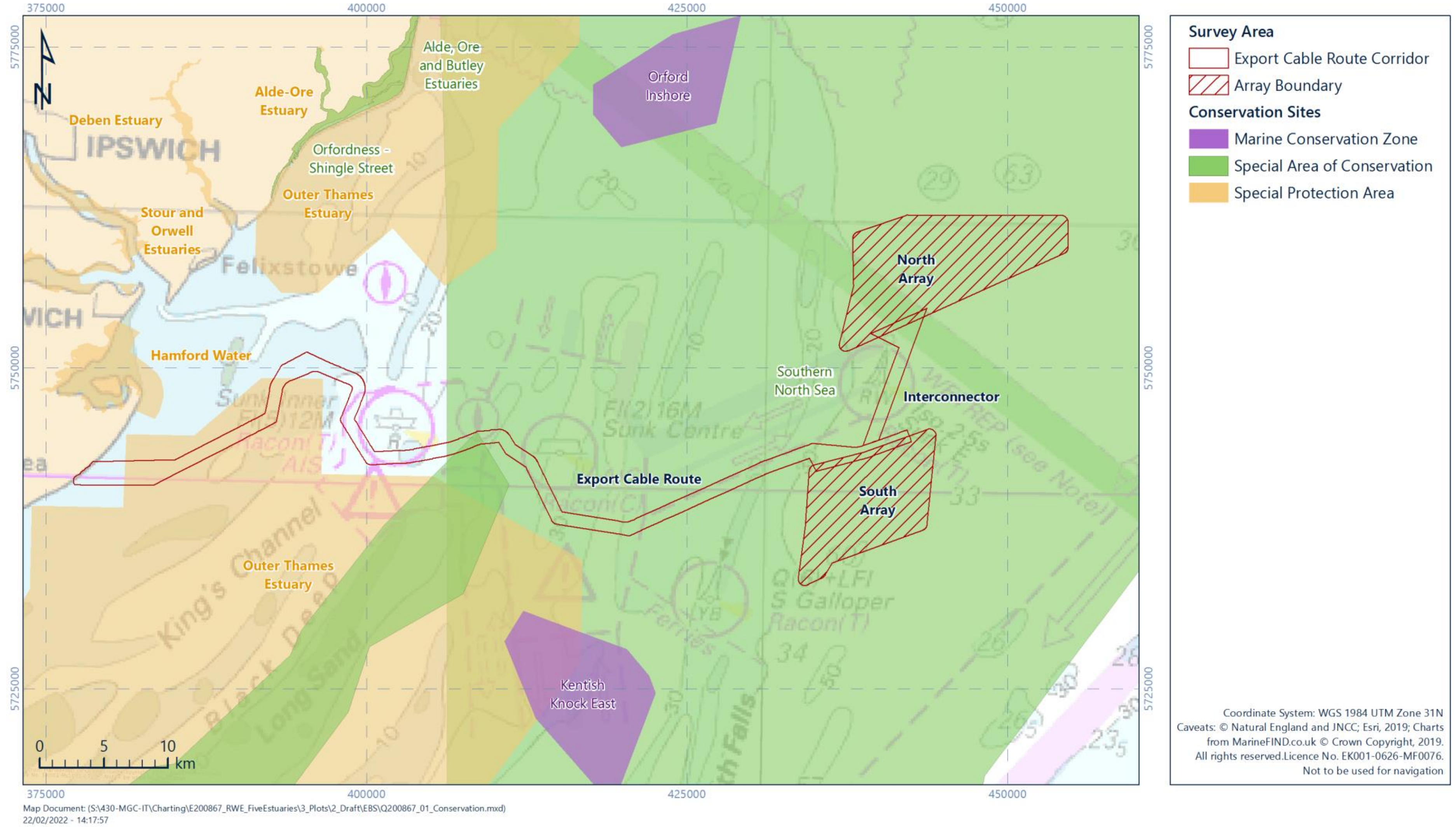


Figure 1.1: Protected areas relevant to the survey area, Five Estuaries Offshore Site Investigation

1.5 Environmental Quality Standards for Sediment Chemical Concentrations

Sediment quality guidelines (SQGs) to evaluate the chemical concentrations included:

- The effects range low (ERL) and effects range median (ERM) concentrations (OSPAR, 2014);
- The Centre for Environment, Fisheries and Aquaculture Science (Cefas) Guideline Action Levels (ALs) for the disposal of dredged material (Marine Monitoring Organisation [MMO], 2015);
- The Canadian SQGs for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment [CCME], 2022).

The ERL value is defined as the lower tenth percentile of the dataset of concentrations in sediments associated with biological effects; the ERM is defined as the median (or 50th percentile) of the concentrations associated with biological effects (OSPAR, 2009). Adverse effects on organisms are rarely observed when concentrations fall below the ERL, whilst are often or always observed at concentrations above the ERM (OSPAR, 2009). The numerical values of ERL and ERM were derived from biological toxicity assays and synoptic sampling and are incorporated in SQGs developed for the National Oceanic and Atmospheric Administration (NOAA) National Status and Trends program, as informal tools to evaluate whether a contaminant concentration in sediment might have toxicological effects (Long et al., 1995).

The UK adopts the ERLs as a signatory of the Oslo and Paris (OSPAR) Convention for the assessment of monitoring data of hazardous substances in the environment (OSPAR, 2014), delivering its commitment through the Clean Seas Environmental Monitoring Programme (CSEMP). Some ERLs, however, have not been used in the OSPAR assessment, because their values are less than the OSPAR Background Assessment Concentration (BAC) used to evaluate the contamination status of marine sediment across the OSPAR maritime area. This is the case of the metals arsenic and nickel (OSPAR, 2009). Background Assessment Concentrations are normalised to 5 % aluminium, while no normalisation is made when deriving the ER values (OSPAR, 2009).

The CSEMP extracts data from the Marine Environment Monitoring and Assessment National (MERMAN) database. Fifteen marine stations around England and Wales are monitored by Cefas as part of the CSEMP programme (Cefas, 2012). Of these, station 475, in the Outer Thames Gabbard area, was referred to for regional contextualisation of this study's results.

The Cefas ALs are non-statutory guidelines to determine whether dredged material is suitable for disposal at sea by providing a proxy risk assessment for potential impacts to biological features such as fish and benthos (Mason et al., 2022). In general, concentrations below Cefas AL1 are of no concern, whilst concentrations above Cefas AL2 indicate that dredged material is unsuitable. Values between Cefas AL1 and AL2 may require further investigatory work prior to a disposal decision (MMO, 2015).

The Canadian SQGs for the Protection of Aquatic Life are numerical concentrations or narrative statements intended to protect all forms of freshwater and marine (including estuarine) aquatic life for an indefinite period of exposure to substances associated with seabed sediments (CCME, 2022). The guidelines consist of threshold effects levels (TELs) and probable effects levels (PELs). Together, they are used to identify three ranges of chemical concentrations for biological effects:

1. Values below TEL indicate the minimal effect range within which adverse effects rarely occur;
2. Values between TEL and PEL indicate the possible effect range where adverse effects occasionally occur;
3. Values above the PEL indicate the probable effect range within which adverse effects frequently occur.

1.6 Coordinate Reference System

All coordinates detailed in this report are referenced to World Geodetic System 1984 (WGS84), Universal Transverse Mercator (UTM) projection Zone 31N central meridian 3° East (CM 3° E). Table 1.4 provides the detailed geodetic and projection parameters.

Table 1.4: Project geodetic and projection parameters

Global Navigation Satellite System (GNSS) Geodetic Parameters	
Datum:	World Geodetic System 1984 (WGS 84)
Spheroid:	World Geodetic System 1984
Semi major axis:	a = 6 378 137.000 m
Reciprocal flattening:	1/f = 298.257 223 563
Project Projection Parameters	
Grid Projection:	Universal Transverse Mercator (UTM)
UTM Zone:	31N (EPSG: 32631)
Central Meridian:	3° 00′ 00″ East
Latitude of Origin:	00° 00′ 00″ North
False Easting:	500 000 m
False Northing:	0 m
Scale factor on Central Meridian:	0.9996
Units:	metre
Notes EPSG = European Petroleum Survey Group	

2. Survey Strategy

2.1 Geophysical Data

The geophysical scope of work, detailed in Fugro, (2021a; 2022b) comprised acquisition of data in the north and south arrays, along the interconnector and the ECR. Geophysical data were acquired using a multibeam echosounder (MBES), side scan sonar (SSS), sub-bottom profiler (SBP), single magnetometer and single-channel sparker.

2.2 Environmental Data

The environmental survey strategy was outlined by Five Estuaries OWF (2021).

2.2.1 Intertidal

Eight transects, perpendicular to the shoreline, were selected across the survey area, following Phase I habitat mapping survey of the intertidal area. Samples for macrofaunal and particle size distribution (PSD) analysis were proposed at high, mid and low water locations along each of the transects. Along transect I_TR06, sampling locations were established at mid and low water, owing to the presence of rock armour at high water. Samples for chemistry analysis were proposed along one transect, which was selected during the survey operations to ensure targeting of finer sediments.

Figure 2.1 presents the extent of the intertidal survey of the nearshore section of the ECR.

Table 2.1 provides the coordinates, proposed sample acquisition and rationale for each location.

Table 2.1: Proposed intertidal transects and core sampling locations, Five Estuaries Offshore Site Investigation

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]					
Transect		Easting	Northing	Rationale	Sample Acquisition
I_TR01	HW	376 906	5 741 242	Southernmost location in a sandy area subject to disturbance from small boat launching. Sediments at HW comprised gravelly sand/sandy gravel. Sediments at MW and LW comprised gravelly sand with no conspicuous fauna	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	376 943	5 741 189		
I_TR02	HW	377 045	5 741 308	Sediments at HW comprised gravelly sand/sandy gravel. Sediments at MW and LW comprised sands with no conspicuous fauna	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	377 092	5 741 255		
I_TR03	HW	377 337	5 741 581	Sediments at HW and MW comprised sandy gravel/gravelly sand. Sediments at LW comprised rippled sand with remnants of the old seawall	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	377 386	5 741 532		

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]					
Transect		Easting	Northing	Rationale	Sample Acquisition
I_TR04	HW	377 707	5 741 799	Sediments at HW comprised gravelly sand/sandy gravel. Sediments at MW comprised gravelly sand/sandy gravel with cobbles. Sediments at LW comprised rippled sand with *Nephtys* sp.	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	377 765	5 741 755		
I_TR05	HW	377 993	5 742 061	Sediments at HW comprised gravelly sand/sandy gravel. Sediments at MW and LW comprised sands with no conspicuous fauna	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	378 032	5 742 033		
I_TR06	HW	378 326	5 742 290	No sediment at HW zone owing to the presence of rock armour. Narrow MW zone with sediment comprising gravelly sand. Sediment at LW comprised rippled sand with no conspicuous fauna	MW – FA, PSD LW – FA, PSD
	LW	378 341	5 742 274		
I_TR07	HW	378 475	5 742 478	Sediments at HW and MW comprised sandy gravel/gravelly sand. Sediment at LW comprised sand with no conspicuous fauna	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	378 520	5 742 438		
I_TR08	HW	378 751	5 742 765	Northernmost transect in an area with groynes. Sediments at HW and MW comprised sandy gravel/gravelly sand. Sediment at LW sediment comprised sand with *Arenicola marina*	HW - FA, PSD MW – FA, PSD LW – FA, PSD
	LW	378 799	5 742 723		
Notes HW = High water MW = Mid water LW = Low water FA = Faunal sample A PSD = Particle size distribution sample					

Figure 2.1: Proposed intertidal transect locations

2.2.2 Export Cable Route

A total of 47 environmental sampling stations was predetermined by Fugro environmental scientists and approved by the client.

Acquisition of DDV and photographic data was proposed prior to obtaining macrofaunal and physico-chemical grab samples. Acquisition of sediment samples for chemistry analysis was proposed at nine stations. Selection of stations for chemistry samples considered spread across the survey area targeting locations with the greatest predicted mud content, through review of geophysical data.

Five drop-down video (DDV) samples were proposed to target areas of hard/coarse substrates as identified following a review of the geophysical data. Twelve DDV transects were proposed in areas of potential conservation importance, referred to as 'areas of focus'.

Rationale for the environmental survey strategy was based on an initial review of publicly available regional data and aligned with the approach agreed with Natural England, the Marine Management Organisation and Cefas. The sample locations were further refined based on the findings of the geophysical survey. Additional stations/transects were selected after a review of the side scan sonar (SSS) and bathymetric data, with emphasis on areas of potential conservation importance (e.g. Annex I listed habitats), as well as boundaries between areas of differing sonic reflectivity, bathymetric highs and lows and areas characteristic of the general background conditions of the site.

The ECR survey area was divided into four survey blocks denoted with the prefixes FE4 to FE7 from the offshore to the nearshore sections, respectively.

Table 2.2 provides the coordinates, proposed data acquisition and rationale for each location. Acceptable sampling accuracy was agreed with the client within 50 m of the target location. If after three attempts, no sample was attained, the station would be relocated by 50 m and sampling re-attempted. If no sample was acquired following the 50 m relocation, the station would be abandoned.

Figure 2.2 presents the proposed survey locations overlaid on the side scan sonar (SSS).

Table 2.2: Proposed sampling stations, export cable route, Five Estuaries Offshore Site Investigation

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Rationale	Data and Sample Acquisition
Block FE4				
FE4_01	422 088.0	5 738 358.0	Regularly spaced HG location; gravelly muddy sands with potential clay to investigate through DDV transect ('area of focus')	Video and stills FA, PSD
FE4_02	423 692.0	5 739 131.0	Regularly spaced HG location; likely gravelly muddy sands with potential for clay to	Video and stills FA, PSD, PC

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Rationale	Data and Sample Acquisition
			investigate through DDV transect ('area of focus')	
FE4_03	425 301.0	5 739 840.0	Regularly spaced HG location; likely gravelly muddy sands with potential for clay to investigate through DDV transect ('area of focus')	Video and stills FA, PSD
FE4_04	426 929.0	5 740 543.0	Regularly spaced HG location; likely gravelly muddy sands with potential for clay to investigate through DDV transect ('area of focus')	Video and stills FA, PSD
FE4_05	428 550.0	5 741 277.0	Regularly spaced HG location; likely gravelly muddy sands with potential for clay to investigate through DDV transect ('area of focus')	Video and stills FA, PSD, PC
FE4_06	430 202.0	5 742 064.0	Regularly spaced HG location; sand waves	FA, PSD
FE4_07	431 465.0	5 742 299.0	Regularly spaced HG location; provisionally located 500 m from Galloper interconnectors; sand ripples	FA, PSD
FE4_08	433 566.5	5 743 146.2	Regularly spaced HG location; likely gravelly muddy sands with potential for clay to investigate through DDV transect ('area of focus')	Video and stills FA, PSD
Block FE5				
FE5_01	410 739.0	5 744 398.9	Regularly spaced HG location; mixed sediments; potential coarse substrates to investigate through DDV transect; likely trawl lines in area	Video and stills FA, PSD
FE5_02	411 906.0	5 743 421.0	Regularly spaced HG location; potential mixed sediments with sand ripples	FA, PSD
FE5_03	412 839.0	5 742 381.0	Regularly spaced HG location; likely gravelly muddy sands	FA, PSD
FE5_04	413 827.5	5 741 203.2	Regularly spaced HG location; likely gravelly muddy sands with sand ripples in area	FA, PSD
FE5_05	414 453.9	5 739 853.3	Regularly spaced HG location; likely gravelly muddy sands, with sand ripples	FA, PSD
FE5_06	414 947.4	5 738 480.2	Regularly spaced HG location; likely gravelly muddy sands with patch of feature of potential conservation importance (based on similar signature to others with DDV)	FA, PSD
FE5_07	416 360.4	5 737 761.0	Regularly spaced HG location; mixed sediments with sand ripples.	FA, PSD
FE5_08	417 654.0	5 737 551.0	Regularly spaced HG location; mixed sediments	FA, PSD
FE5_09	419 142.9	5 737 800.3	Regularly spaced HG location; gravelly muddy sands with potential clay and coarse sediments to investigate through DDV sample	Video and stills FA, PSD, PC

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Rationale	Data and Sample Acquisition
FE5_10	420 438.0	5 737 564.0	Regularly spaced HG location and edge of data overlap; mixed sediments	FA, PSD
Block FE6				
FE6_01	398 993.0	5 747 423.0	Spaced for 47 ECR HG; likely sand	FA, PSD
FE6_02	398 489.0	5 746 031.0	Regularly spaced HG location; likely sand	FA, PSD
FE6_04	399 941.0	5 743 615.0	Spaced for 47 ECG HG; rippled sands (or mixed sediments)	FA, PSD
FE6_05	401 027.0	5 742 943.0	Regularly spaced HG location; likely rippled sands	FA, PSD
FE6_06	402 426.0	5 743 023.0	Regularly spaced HG location; sand wave	FA, PSD
FE6_07	403 871.0	5 743 138.0	Regularly spaced HG location; sand ripples/waves	FA, PSD
FE6_08	405 301.0	5 743 436.0	Regularly spaced HG location; sand ripples/waves	FA, PSD
FE6_09	406 753.0	5 743 803.0	Regularly spaced HG location; sand ripples	FA, PSD
FE6_10	408 472.0	5 744 432.0	Within Margate and Long Sands SAC northern edge; sand ripples	FA, PSD
FE6_11	409 460.0	5 744 858.0	Regularly spaced HG location; at edge of available SSS data; likely mixed sediments	FA, PSD, PC
Block FE7				
FE7b_01	381 555.4	5 742 302.3	Potential hard/coarse substrate feature, extending east/west along central area of ECR, at the edge of the 5 m LAT contour to investigate through DDV sample	Video and stills
FE7b_02	381 454.7	5 742 388.5	Central to area with potential hard/coarse signature, distinct from FE7b_01 signature, to investigate through DDV sample	Video and stills FA, PSD, PC
FE7b_03	381 508.9	5 742 019.1	Likely mixed coarse sediment; potential 'area of focus' for investigation through DDV transect subject to underwater visibility	Video and stills
FE7b_04	382 109.0	5 742 112.9	Representative of area of potential mixed sediments	FA, PSD, PC
FE7b_05	383 290.0	5 742 263.0	Regularly spaced HG location	FA, PSD
FE7b_06	384 667.0	5 742 324.0	Regularly spaced HG location; potential mixed sediments	FA, PSD
FE7c_01	385 936.0	5 742 691.0	Spaced for 47 ECR HG; potential mixed sediments	FA, PSD
FE7c_02	387 190.0	5 743 318.0	Regularly spaced HG location; likely mixed sediments	FA, PSD
FE7c_03	388 184.0	5 743 823.0	Regularly spaced HG location; SSS reflectivity similar to that of FE7c_02	FA, PSD

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Rationale	Data and Sample Acquisition
FE7c_04	389 055.0	5 744 022.0	Regularly spaced HG location and central to area of low reflectivity; potentially mud/sandy mud to gravelly mud/clay	FA, PSD, PC
FE7d_01	390 309.0	5 744 985.0	Regularly spaced HG location; mixed sediments	FA, PSD
FE7d_02	391 572.8	5 745 581.8	Regularly spaced HG location; likely mixed sediments; potential stony ground and clay to investigate through DDV transect; ('area of focus')	Video and stills FA, PSD
FE7d_02a	390 625.3	5 745 539.2	Feature similar to that of FE7d_02, though larger; potential clay exposure or coarse sediments ('area of focus') to investigate through DDV transect;	Video and stills
FE7d_03	392632.9	5746248	Regularly spaced HG location with high potential for successful grab sampling; SSS signature similar to that of FE7d_02	FA, PSD
FE7d_03a	392590.3	5746236.9	Feature similar to that of FE7d_02a; potential coarse sediments to investigate through DDV sample	Video and stills
FE7e_01	392 863.0	5 747 783.0	Regularly spaced HG location. North eastern (transitory?) end of higher reflectivity of FE7c_02/03; potential stones to gravelly sands	FA, PSD
FE7e_01a	392 894.4	5 748 177.1	Edge of potential stony sediments; SSS signature similar to that of FE7e_01; potential hard/coarse substrate to investigate through DDV sample	Video and stills
FE7e_02	392 970.0	5 748 303.0	Band of lower reflectivity 500 m NE of FE7e_01 in slightly deeper area (10 m LAT) and potentially mixed sediments	FA, PSD, PC
FE7e_03	393 566.0	5 749 542.0	Regularly spaced HG location; higher reflectivity and shallower water than those of FE07e_02; potentially rippled sand	FA, PSD
FE7e_03a	393 756.8	5 749 639.0	Likely coarse sediment in rippled sand; potential 'area of focus' to investigate through DDV transect	Video and stills
FE7f_01	394 682.0	5 750 306.0	Regularly spaced HG location; band of slightly deeper (> 10 m LAT) sediments with lower reflectivity than that of location to the west; potentially rippled sand and/or gravelly sand	FA, PSD
FE7f_02	395 936.0	5 750 566.0	Regularly spaced HG location < 10 m LAT and transitional lower reflectivity from location to west; potential gravel and sand sediments with clays; potential 'area of focus' to investigate through DDV transect	Video and stills FA, PSD
FE7g_01	397 129.0	5 749 909.0	Regularly spaced HG location; area of lower reflectivity before slope to deeper water	FA, PSD

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Rationale	Data and Sample Acquisition
			(10 m - 15 m – 20 m LAT); potentially mixed sediments	
FE7g_02	398 410.0	5 749 371.0	Regularly spaced HG location; and rippled slope	FA, PSD
FE7g_03	399 484.4	5 748 814.3	Low slope of sand rippled area, low reflectivity location of potentially muddier sand	FA, PSD, PC

Notes
DDV = Drop-down video
DG = Day grab
FA = Faunal sample A
HG = Hamon grab
LAT = Lowest astronomical tide
PC = Physico-chemical sample
PSD = Particle size distribution
SSS = Side scan sonar

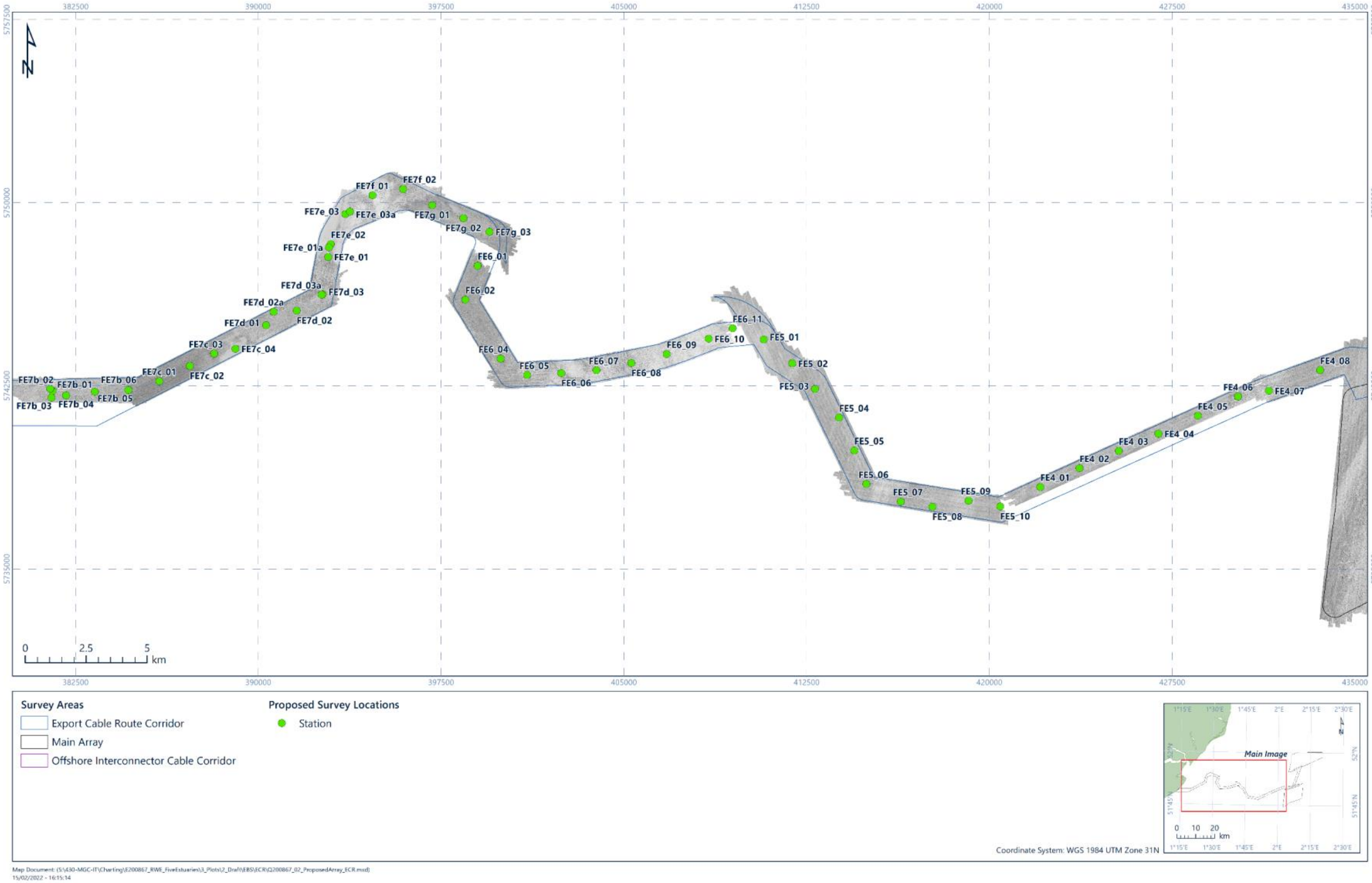


Figure 2.2: Proposed survey locations overlaid on a side scan sonar mosaic, export cable route, Five Estuaries Offshore Site Investigation

3. Methods

3.1 Survey Methods

Survey methods have been presented in the Acquisition/Operations Report (Fugro, 2021b, 2021c) and are summarised below.

3.1.1 Intertidal

The intertidal habitat mapping survey was undertaken following the JNCC Marine Monitoring Handbook Procedural Guideline 3.1: In situ intertidal biotope recording (Davies et al., 2001), the Common Standards Monitoring Guidance Procedural Guidelines for Littoral Sediment (JNCC, 2004a) and Littoral Rock and Inshore Sublittoral Rock Habitats (JNCC, 2004b). The resolution of intertidal mapping using this combination of methods is between Phase 1 terrestrial mapping (JNCC, 2010) and the Marine Nature Conservation Review (MNCR) Phase II methods (Hiscock, 1996).

A modified Phase I walkover habitat mapping survey was conducted to record intertidal habitats and associated fauna and flora to derive information on habitat composition and distribution, including sub-features. The entire vertical profile of the shore was investigated, from the supralittoral zone to the low water spring tide level (where safe access allowed), as identified by standard Admiralty tidal predictions.

Walkovers were supplemented by occasional qualitative dig-overs of representative sedimentary habitats. Approximately 0.1 m^2 of surface sediment was processed through a 1 mm mesh sieve to provide a rapid in situ assessment of substrate type and conspicuous benthic infauna.

Colour aerial photographs covering the survey area were produced as field maps. Habitat boundaries were established and manually mapped onto field maps and any associated faunal and floral assemblages recorded. Digital photographs were captured (using a Fujifilm XP series camera) and georeferenced within each habitat to facilitate detailed ground truthing of the mapping process.

Target notes were made for unmappable features (e.g. vertical faces, fine scale habitats of < 5 m^2 or those occurring as mosaics), as well as anthropogenic features (e.g. coastal protections, shore access, sewage and/or debris) and features of interest. Target notes were also made with reference to saltmarsh encroachment, non-native species (NNS), localised erosion and sediment accretion.

A Phase II intertidal habitat mapping was fulfilled through acquisition of sediment core samples acquired using a 11.2 cm diameter (0.01 m^2) stainless steel corer pushed into the sediment to a depth of 15 cm. The core samples were subsequently sieved over a 0.5 mm mesh sieve (see Section 3.2.7). Sediment redox measurement were taken where possible.

Redox measurements were taken in situ using a Hanna HI 98121 multiparameter meter. Along with redox, the meter measured pH and temperature, which are required to correct redox values to align with the output of a standard hydrogen electrode pair, in line with International Organisation for Standardisation (ISO) 11271.

3.1.2 Export Cable Route

3.1.2.1 Seabed Video and Photography

Operational procedures for seabed photography followed those outlined in Hitchin et al., (2015). Seabed video and photography were acquired using a Subsea Technology and Rentals (STR) deep-sea camera system mounted within a purpose-built camera frame complete with one high-definition video camera, one high resolution stills camera, a separate strobe and four light emitting diode (LED) lamps.

Seabed video and photographic data were displayed on a computer monitor and recorded directly onto a local hard drive. A video overlay was used to overlay a navigation string from the Hemisphere differential GPS, including the time, date, depth and location (easting and northing). The survey location and station number were also displayed (manually updated). The stills camera imagery was visible on a second window of the computer. Photographic data were viewed in real time via a sonar cable, assisting in the control of the camera in the water. Two lasers were set up 17 cm apart to provide a scale.

In areas of poor visibility, seabed photography was acquired also using the back-up Bowtech SeaKnight underwater camera system mounted within a freshwater frame.

3.1.2.2 Sediment Sampling

Samples for faunal and sediment PSD analysis were acquired using a 0.1 m^2 mini Hamon grab. Samples for chemistry analysis were acquired using a 0.1 m^2 Day grab.

Appendix B provides further details of survey methods.

3.2 Laboratory Methods

A sample delivery log accompanied the samples to Fugro laboratories as part of the chain of custody. Upon receipt of samples at Fugro laboratories, sample handling and labelling of each sample was inspected to ascertain correct storage in line with the sampling methods. Any potential deviations from sampling methods are addressed and resolved at this stage in line with Fugro’s Quality Assurance Management System.

3.2.1 Sediment Characteristics

3.2.1.1 Particle Size Distribution

Sediment samples were analysed by Fugro using dry sieve analysis and laser diffraction.

Dry sieve PSD analysis was undertaken in accordance with FGBML in-house methods based on the North East Atlantic Marine Biological Association Quality Control (NMBAQC) scheme’s best practice guidance document – Particle Size Analysis (PSA) for Supporting Biological Analysis: 2016 (Mason, 2016), and British Standards (BS) 1377: Parts 1: 2016 and 2: 1990). Representative material > 1 mm was split from the bulk sub-sample and oven dried before being sieved through a series of sieves with apertures corresponding to 0.5 phi intervals between 63 mm and 1 mm as described by the Wentworth scale (Wentworth, 1922). The weight of the sediment fraction retained on each mesh was subsequently measured and recorded.

Laser diffraction PSD analysis was undertaken in accordance with FGBML in-house methods based on Mason (2016), and BS ISO 13320: 2020. Representative material < 1 mm was removed from the bulk subsample for laser analysis, with a minimum of three triplicate analyses performed using the laser sizer at 0.5 phi intervals between < 1 mm to < 0.04 µm. Laser diffraction was carried out using a Malvern Mastersizer 2000 with a Hydro 2000G dispersion unit.

3.2.2 Sediment Hydrocarbons

The sediment samples were analysed for total hydrocarbon content (THC) and polycyclic aromatic hydrocarbons (PAHs) by SOCOTEC.

3.2.2.1 Total Hydrocarbon Content

Anhydrous sodium sulphate, sodium chloride and dichloromethane (DCM) were added to a portion of the sample and vigorously agitated. The sample was placed in an ultrasonic bath and then centrifuged. The extract was then analysed by ultraviolet fluorescence screening and quantified by comparing the results against a Forties oil calibration curve.

3.2.2.2 Polycyclic Aromatic Hydrocarbons (PAH)

Methanol and DCM were added to a portion of the sample and mixed on a magnetic stirring plate. The solvent extract was then water partitioned and concentrated to a low volume. A double clean-up stage was employed to remove contaminants that may interfere with the analysis. The extract was then analysed by gas chromatography – mass spectrometry (GC-MS) and quantified by comparing the results against a calibration curve for each of the target analytes.

3.2.3 Sediment Metals

The sediment samples were analysed for trace and heavy metal content by SOCOTEC using an aqua regia digest. The eleven metals analysed were aluminium, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, tin and zinc. A portion of air dried and ground sample was digested with aqua regia. Once cooled, the extract was filtered and pre-diluted before being analysed by inductively coupled plasma-mass spectrometry (ICP-MS) (or by inductively coupled plasma-optical emission spectrometry (ICP-OES) and quantified by comparing the results against a calibration curve for each of the target analytes.

This analytical technique provides a strong partial digest, releasing into solution metals associated with the fines fraction within the sediments (but does not extract all trace elements associated with the coarse fraction). The concentrations of metals released by an aqua regia digest are considered indicative of those influencing biological interactions, as the released metals are not incorporated into the mineral matrix and are therefore potentially available for biological uptake.

3.2.4 Sediment Polychlorinated Biphenyls

Sediment samples were analysed by SOCOTEC using solvent extraction and clean-up followed by gas chromatography coupled to a triple quadruple mass spectrometer (GC-MS-MS) analysis. A portion of air-dried and sieved sample was spiked with ^{13}C labelled internal standards, ultrasonically solvent extracted and concentrated under nitrogen. A clean-up stage was employed to remove contaminants that may interfere with the analysis. The sample extract was analysed by GC-MS-MS and quantified by comparison with a solution containing each of the targeted compounds, normalised to the ^{13}C labelled internal standards.

3.2.5 Sediment Organotins

Sediment samples were analysed by SOCOTEC using solvent extraction and derivatisation followed by GC-MS analysis. A portion of the sample was digested with hydrochloric acid and methanol before being extracted into toluene. The extract was then derivatised using sodium tetraethylborate before concentration and a copper/silica clean-up was performed. The extract was analysed by GC-MS and quantified by comparing the results against a calibration curve for each of the target analytes.

3.2.6 Organochlorine Pesticides (OCPs)

Sediment samples were analysed by SOCOTEC using solvent extraction and clean-up followed by GC-MS-MS analysis.

3.2.7 Sediment Macrofauna

Samples were analysed at FGBML's benthic laboratory in accordance with Fugro in-house quality assured procedures (EUAF-FGBM-BEN-TM-001), which are consistent with the requirements of the NMBAQC scheme (Worsfold et al., 2010) and the relevant ISO standards for macrobenthic analysis. Fugro's operations are covered by a Procedures Manual and Methods Manual. These documents together with Fugro working practices are routinely audited under ISO 9001:2015 and/or United Kingdom Accreditation Service (UKAS) 17025 as appropriate. Samples from the intertidal area were sieved over a 0.5 mm mesh sieve whereas subtidal samples along the ECR were sieved over a 1.0 mm mesh sieve. Taxa were identified to the lowest taxonomic level and enumerated. Sessile colonial epifauna was recorded as present (P).

Species nomenclature is consistent with that of World Register of Marine Species (WoRMS Editorial Board, 2022). The taxonomic order is based on Species Directory codes (Howson &

Picton, 1997). Taxa of doubtful identification due to damage of specimen or unresolved taxonomic status are indicated by a question mark preceding the genus (e.g. ?*Capitella*) or species (e.g. *Capitella* ?*capitata*) name.

Biomass analysis was undertaken on the infauna from the grab samples, following identification and enumeration. The infauna from each sample was sorted into seven groups, to include Oligochaeta, Polychaeta, Crustacea, Mollusca, Echinodermata, Cnidaria (only burrowing species) and other phyla. Nematoda, Copepoda and Astrorhiza were not required to be extracted, enumerated or identified. Biomass was undertaken using the wet blot method.

3.3 Data Analysis

Summary statistics (minimum, maximum, mean, standard deviation) for all reported datasets were derived in Excel.

3.3.1 Sediment Particle Size Distribution Statistics

Data from the sieve and laser analysis were merged and entered in Gradistat version 8 (v8) (Blott, 2010) to derive statistics including cumulative percentage of each particle size passing through each sieve, percentage retained on each sieve stack, mean and median grain size, bulk sediment classes (percentage fines, sand and gravel), skewness and sorting coefficients, and Folk (1954) classification. Table 3.1 summarises the sediment PSD statistics that were calculated using Gradistat v8. Statistics are based on the Folk and Ward (1957) method.

The Wentworth (1922) sediment classification is based on mean sediment particle size. The Folk (British Geological Survey (BGS) modified) classification (Long, 2006) is based on percentages of main sediment fractions (fines, sand and gravel). Results are reported in micron (µm) and phi (ϕ) measurement units. Phi is a logarithmic scale which allows particle size data to be expressed in unit of equal value for graphical plotting and statistical calculations; the scale is based on the relationship:

$Phi\ (\phi) = -log2d$, where d is the particle size diameter in mm.

Table 3.1: Sediment particle size distribution statistics

Statistic	Definition and Descriptive Terminology
Mean	The arithmetic mean of all the sediment particles in a sample; expressed in metric and phi units
Median	A measure of central tendency, that is the midpoint of the grain size distribution where half of the sediment grains resides above this point and half below
Mode	The peak of the frequency distribution, that is the particle size (or size range) most commonly found in the distribution
Modality	A measure of the number of peaks in the frequency distribution
Sorting	A measure of the grain size range and magnitude of their spread around the mean, presented as a coefficient and descriptor (as a range of values)
Skewness	A measure of the degree of symmetry, presented as a coefficient and descriptor (as a range of values)

3.3.2 Sediment Macrofauna Data Rationalisation

Prior to analysis, the macrofaunal dataset was rationalised. To avoid spurious enhancement of the species list, damaged taxa were removed whereas some taxa were merged with a higher corresponding taxon identified. Juveniles were also removed as they represent an ephemeral stage of the macrofaunal community and are, therefore, not representative of prevailing benthic conditions. Sessile colonial epifauna, recorded as P, was also removed prior to analysis and assessed separately from the enumerated data set.

3.3.3 Sediment Macrofaunal Univariate Analysis

Table 3.2 summarises the univariate statistics derived from PRIMER (v7).

Table 3.2: Macrofaunal Univariate Statistics

Statistic	Definition
Number of taxa (S)	Count of taxa
Abundance (N)	Count of individuals
Margalef's index of richness (d)	A measure of the number of species present for a given number of individuals
Shannon-Wiener index of diversity ($H'\log_2$)	A measure of the number of taxa in a sample and the distribution of abundance across these taxa; results were assessed in line with the threshold values in Dauvin et al. (2012): ▪ High diversity ($H'\log_2 > 4.00$); ▪ Good diversity ($3.00 < H'\log_2 < 4.00$); ▪ Moderate diversity ($2.00 < H'\log_2 < 3.00$); ▪ Poor diversity ($1.00 < H'\log_2 < 2.00$); ▪ Bad diversity ($H'\log_2 < 1.00$)
Pielou's index of evenness (J)	A measure of how evenly distributed the individuals are among the different species
Simpson's index of dominance (λ)	A measure of dominance whereby its largest value corresponds to assemblages the total abundance of which is dominated by one or very few of the taxa present

3.3.4 Biomass Analysis

The macrofaunal blotted wet weight biomass dataset was converted to ash free dry weight (AFDW) by applying the appropriate standard corrections, as outlined in Eleftheriou and Basford (1989). Table 3.3 summarises the corrections applied.

Table 3.3: Macrofaunal standard biomass corrections by phyla

Phyla	Standard Biomass Correction [%]
Annelida	15.5
Arthropoda	22.5
Mollusca	8.5
Echinodermata	8.0
Other Taxa	15.5
Notes Standard biomass corrections to convert blotted wet weight to ash free dry weight, from Eleftheriou & Basford (1989)	

3.3.5 Multivariate Analysis

Table 3.4 summarises the multivariate analysis undertaken for macrofaunal and sediment datasets in PRIMER v7 (Clarke & Gorley, 2015). Multivariate analysis was undertaken on data from the subtidal section of the export cable route. Data transformation was undertaken prior to multivariate analysis, where deemed necessary. Transformation was applied to sediment particle size data to reduce the degree of skewness and allow optimal performance of the multivariate analysis (detailed in Section 4.2.3). Transformation was applied to macrofaunal data matrix to reduce the influence of the numerically dominant taxa which may mask the underlying community composition (detailed in Section 4.4.3.3) (Clarke et al., 2014).

Table 3.4: Multivariate Statistics

Statistic	Definition
Cluster	Hierarchical clustering, 'Cluster' analysis, groups samples based on the nearest neighbour sorting of a matrix of sample similarities using Bray Curtis similarity (for biological datasets) or Euclidean distance measure (for environmental datasets)
Dendrogram and nMDS	Dendrogram and non-metric multidimensional scaling (nMDS) ordination are outputs of Bray Curtis and Euclidean Distance similarity/distance matrices. The dendrogram is a tree-like diagram illustrating the relationships between samples based on their level of similarity. The nMDS ordinates the samples in a two-dimensional plane where the more similar samples are, the nearer they are. The extent to which these relations can be adequately represented in a two-dimensional map is expressed as the stress coefficient statistic, low values (< 0.1) indicating a good ordination with no real prospect of misleading interpretation (Clarke et al., 2014). Used together, dendrogram and nMDS allow checking adequacy and mutual consistency of both representations to ensure correct interpretation
SIMPER	Similarity Percentage analysis gauges the distinctiveness of each of the multivariate groups of samples, by listing the species that most contribute to the multivariate group in terms of abundance and frequency of occurrence
SIMPROF	Similarity profiling (SIMPROF test), to identify statistically significant sample groupings from the cluster analysis, depicted as red lines; the PRIMER default significance level of 5 % was adopted; in ecological terms the statistical relevance of SIMPROF was assessed in line with the recommendation of Clarke et al. (2008), thus '*defining coarser grouping can be appropriate if the resulting groups are always supersets of the similarity profile groups*'

Statistic	Definition
PCA	Principal component analysis (PCA), to identify multidimensional patterns and relationships between variables, subsequently compressed by reducing the number of dimensions without loss of information. The degree to which a 2D PCA succeeds in representing the full multidimensional information is in the percentage of the total variance expressed by the first two principal component axes. A picture which accounts for as much as 70 % to 75 % of the original variation describes the overall structure well (Clarke et al., 2014)
BIOENV	Identifies relationships between biological and environmental variables; available in PRIMER v7 as BEST, which amalgamates the Bio-Env and Stepwise procedures, and allows to evaluate the strength of association between the variables tested and the significance level

3.3.6 Seabed Habitats and Biotopes

Habitats and biotopes within the survey area were classified in line with the hierarchical European Nature Information System (EUNIS) habitat classification (European Environment Agency [EEA], 2019), which has compiled criteria for habitat identification across Europe into a single database. Table 3.5 presents the EUNIS hierarchy, with an example of the coding system. Habitats and biotopes along the ECR were classified by integrating the results of the grab sampling, detailed in this report, with the results of the video and still image analysis, detailed in the Environmental Features Report (Fugro, 2022a). Habitats and biotopes were subsequently assessed for their ecological and conservation importance drawing upon the current marine nature conservation legislation.

Table 3.5: EUNIS (EEA, 2019) biotope classification hierarchy example

Level	Example Classification Name	Example Classification Code
1. Environment	Marine habitats	A
2. Broad habitat types	Sublittoral sediments	A5
3. Main habitats	Sublittoral sand	A5.2
4. Biotope complexes	Circalittoral muddy sand	A5.26
5 & 6. Biotopes and sub-biotopes	*Amphiura brachiata* with *Astropecten irregularis* and other echinoderms in circalittoral muddy sand	A5.262

3.3.6.1 Sensitive Habitats and Species Assessments

Habitats were assessed for their conservation status using the Annex I habitat list (Joint Nature Conservation Committee [JNCC], n.d.). Sensitive habitats such as stony reefs were assessed in line with the criteria in Irving (2009) and Golding et al. (2020). Biogenic reefs such as *Sabellaria spinulosa* reefs were assessed in line with the criteria in Gubbay et al. (2007), Hendrick and Foster-Smith (2006) and Limpenny et al. (2010) and the methods in Jenkins et al. (2015). Geogenic and biogenic reefs assessments are detailed in the Environmental Features Report (Fugro 2022a).

Species were assessed for their conservation status using the Annex II species list (JNCC, n.d), the OSPAR list of threatened and/or declining species and habitats (OSPAR, 2021) and the UK BAP priority habitats and species lists (JNCC, 2019). The International Union for

Conservation of Nature [IUCN] red list of threatened species (IUCN, 2022) was also consulted, although the latter is not a list of conservation priorities, rather a comprehensive inventory of the global conservation status of species and is used to assist with decision making about conserving biodiversity at local and global levels.

3.3.6.2 Cryptogenic and Non-native Species (NNS)

Species of unknown origin (cryptogenic) and NNS were assessed using pertinent literature and databases including Invasive Species Compendium (CABI, 2022), National Exotic Marine and Estuarine Species Information System [NEMESIS] (Fofonoff et al., 2022), National Biodiversity Network [NBN] (NBN, 2021), Non-native Species Secretariat [NNSS] (NNSS, 2022), Delivering Alien Invasive Species Inventories for Europe [DAISIE] (DAISIE, 2020) and World Register of Marine Species [WoRMS] (WoRMS Editorial Board, 2022).

4. Results

4.1 Field Operations

4.1.1 Intertidal

All areas of the shore to be surveyed were safely accessed, allowing investigation of the entire width of the export cable corridor.

Core samples were successfully obtained at all proposed sampling locations along the eight proposed transects. Sediment chemistry samples were acquired at high, mid and low water locations along transect I_TR05 (Table 4.1).

Table 4.1: Completed intertidal survey sampling stations Five Estuaries Offshore Site Investigation

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]			
Station	Easting	Northing	Sample Acquisition
I_TR01_HW	376 916.0	5 741 227.5	FA, PSD
I_TR01_MW	376 924.0	5 741 210.8	FA, PSD
I_TR01_LW	376 938.9	5 741 185.4	FA, PSD
I_TR02_HW	377 061.1	5 741 306.0	FA, PSD
I_TR02_MW	377 074.6	5 741 288.8	FA, PSD
I_TR02_LW	377 089.9	5 741 278.4	FA, PSD
I_TR03_HW	377 353.3	5 741 586.6	FA, PSD
I_TR03_MW	377 363.0	5 741 570.8	FA, PSD
I_TR03_LW	377 374.1	5 741 547.5	FA, PSD
I_TR04_HW	377 713.4	5 741 803.7	FA, PSD
I_TR04_MW	377 727.1	5 741 797.4	FA, PSD
I_TR04_LW	377 752.6	5 741 778.2	FA, PSD
I_TR05_HW	377 994.7	5 742 059.3	FA, PSD, SC
I_TR05_MW	378 003.1	5 742 048.5	FA, PSD, SC
I_TR05_LW	378 019.6	5 742 023.7	FA, PSD, SC
I_TR06_MW	378 331.8	5 742 291.9	FA, PSD
I_TR06_LW	378 344.6	5 742 273.2	FA, PSD
I_TR07_HW	378 474.3	5 742 464.3	FA, PSD
I_TR07_MW	378 490.7	5 742 452.2	FA, PSD
I_TR07_LW	378 520.9	5 742 420.5	FA, PSD
I_TR08_HW	378 754.7	5 742 763.8	FA, PSD
I_TR08_MW	378 770.7	5 742 748.7	FA, PSD
I_TR08_LW	378 799.9	5 742 723.6	FA, PSD
Notes FA = Faunal sample A	PSD = Particle size distribution sample		SC = Sediment chemistry sample

4.1.2 Export Cable Route

4.1.2.1 Bathymetry and Seabed Features

Results of the geophysical study are detailed in Fugro (2022c), with the main finding summarised below:

- Water depths ranged from 0.3 m to 56.6 m LAT;
- Within the International Hydrographic Organization Order 1A survey area, water depths ranged from 33.0 m to 58.0 m below LAT ;
- Seabed sediments were assessed by interpreting the reflectivity from the low frequency SSS, cross-correlated to the environmental grab sample results and the SBP;
- Nine sediment classes were interpreted:

4. Sand;
5. Gravelly sand;
6. Muddy sand;
7. Sandy gravel;
8. Mud;
9. Outcrop;
10. Subcrop;
11. Shore unit;
12. Channel infill

- Sand waves and megaripples were visible in most of the areas interpreted as being predominantly sandy;
- A total of 812 SSS contacts ≥ 2 m was identified;
- A total of 3287 magnetic anomalies ≥ 5 nT peak-to-peak was identified; areas of background fluctuations in the magnetometer data were interpreted from SBP to be of geological origin;
- Nine charted wrecks were identified from SSS, MBES or magnetometer data;
- Four main units were interpreted from the SBP data:
    1. Holocene sediments;
    2. Pleistocene channels;
    3. London Clay Formation;
    4. Harwich Member.
- Acoustic blanking was visible and interpreted as such from the SBP
- The depth to the top of the London Clay formation was between 0 mand 16.7 m below seafloor.

4.1.2.2 Seabed Video and Photography

Seabed video and photographic data were successfully acquired at all proposed stations. Ten stations were re-run due to poor underwater visibility (Table 4.2).

Table 4.2: Completed DDV samples and transects, export cable route, Five Estuaries Offshore Site Investigation

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]						
Station		Easting	Northing	Depth [m BSL]	Length [m]	Data Acquisition
Block FE4						
FE4_01	SOL	422 084.1	5 738 388.4	25	70	1 min 37 sec 14 stills
	EOL	422 074.9	5 738 318.7			
FE4_02	SOL	423 696.1	5 739 158.2	28	55	2 min 23 sec 15 stills
	EOL	423 704.6	5 739 103.5			
FE4_03	SOL	425 304.1	5 739 863.4	25	61	2 min 30 sec 22 stills
	EOL	425 290.8	5 739 803.5			
FE4_04	SOL	426 928.5	5 740 559.0	24	54	2 min 35 sec 18 stills
	EOL	426 915.8	5 740 506.8			
FE4_05	SOL	428 559.9	5 741 295.4	25	65	3 min 12 sec 18 stills
	EOL	428 542.2	5 741 233.2			
FE4_08	SOL	433 598.7	5 743 190.2	30	104	2 min 23 sec 25 stills
	EOL	433 545.2	5 743 101.1			
FE4_08a*	SOL	433 568.9	5 743 154.0	30	64	2 min 50 sec 16 stills
	EOL	433 514.9	5 743 119.3			
Block FE5						
FE5_01	SOL	410 744.8	5 744 400.8	28	87	2 min 02 sec 0 stills
	EOL	410 715.8	5 744 318.3			
FE5_01a*	SOL	410 705.0	5 744 340.1	28	52	2 min 06 sec 0 stills
	EOL	410 734.0	5 744 382.7			
FE5_01b*	SOL	410 722.8	5 744 383.2	28	69	2 min 55 sec 3 stills
	EOL	410 735.6	5 744 451.0			
FE5_01c*	SOL	410 734.3	5 744 368.9	28	45	2 min 27 sec 7 stills
	EOL	410 714.9	5 744 409.7			
FE5_09	SOL	419 162.4	5 737 812.7	35	69	2 min 48 sec 16 stills
	EOL	419 112.1	5 737 765.3			
FE5_09a*	SOL	419 137.9	5 737 781.9	35	52	2 min 06 sec 18 stills
	EOL	419 164.0	5 737 827.4			
FE7b_01	SOL	381 580.5	5 742 325.8	7	53	3 min 08 sec 11 stills
	EOL	381 529.9	5 742 309.1			
FE7b_01a*	SOL	381 528.2	5 742 283.3	7	59	4 min 13 sec 12 stills
	EOL	381 564.8	5 742 329.3			
FE7b_02	SOL	381 480.8	5 742 416.3	6	60	4 min 27 sec 9 stills
	EOL	381 427.2	5 742 389.7			

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]						
Station		Easting	Northing	Depth [m BSL]	Length [m]	Data Acquisition
FE7b_03	SOL	381 528.8	5 742 039.4	6	13	3 min 53 sec 12 stills
	EOL	381 538.8	5 742 030.4			
FE7d_02	SOL	391 599.2	5 745 598.3	7.5	58	2 min 44 sec 8 stills
	EOL	391 553.9	5 745 561.4			
FE7d_02a	SOL	390 654.1	5 745 557.3	6	50	3 min 30 sec 14 stills
	EOL	390 625.8	5 745 516.6			
FE7d_03a	SOL	392 614.5	5 746 259.4	10.5	58	3 min 19 sec 8 stills
	EOL	392 584.9	5 746 209.1			
FE7d_03a_a*	SOL	392 615.6	5 746 256.9	9	44	3 min 19 sec 8 stills
	EOL	392 633.3	5 746 217.0			
FE7e_01a	SOL	392 909.0	5 748 203.1	12	56	1 min 40 sec 7 stills
	EOL	392 881.2	5 748 154.4			
FE7e_01a_a*	SOL	392 909.7	5 748 193.2	12	56	4 min 50 sec 12 stills
	EOL	392 868.4	5 748 155.4			
FE7e_03a	SOL	393 775.9	5 749 662.1	10.5	65	3 min 2 sec 13 stills
	EOL	393 731.2	5 749 614.3			
FE7e_03a_a*	SOL	393 784.9	5 749 691.9	10.5	81	5 min 40 sec 16 stills
	EOL	393 758.8	5 749 615.6			
FE7f_02	SOL	395 958.6	5 750 563.6	9	72	1 min 5 sec 4 stills
	EOL	395 890.0	5 750 541.8			
FE7f_02a*	SOL	395 971.3	5 750 593.3	12	68	5 min 40 sec 15 stills
	EOL	395 941.8	5 750 532.6			

Notes
* = Re-run location
BSL = Below sea level
SOL = Start of line
EOL = End of line

4.1.2.3 Sediment Sampling

Grab samples were successfully acquired at 44 of the 47 proposed stations along the ECR. Samples for chemistry analysis were successfully acquired at seven of the nine proposed stations (Table 4.3).

At stations FE4_02 and FE6_11a, faunal and PSD samples were successfully acquired, but not chemistry samples, as the coarseness of the sediment prevented sample acquisition through the Day grab. Station FE4_02A was relocated by 50 m to allow acquisition of a sediment sample for chemistry analysis. The relocated station was denoted FE4_02_50 m.

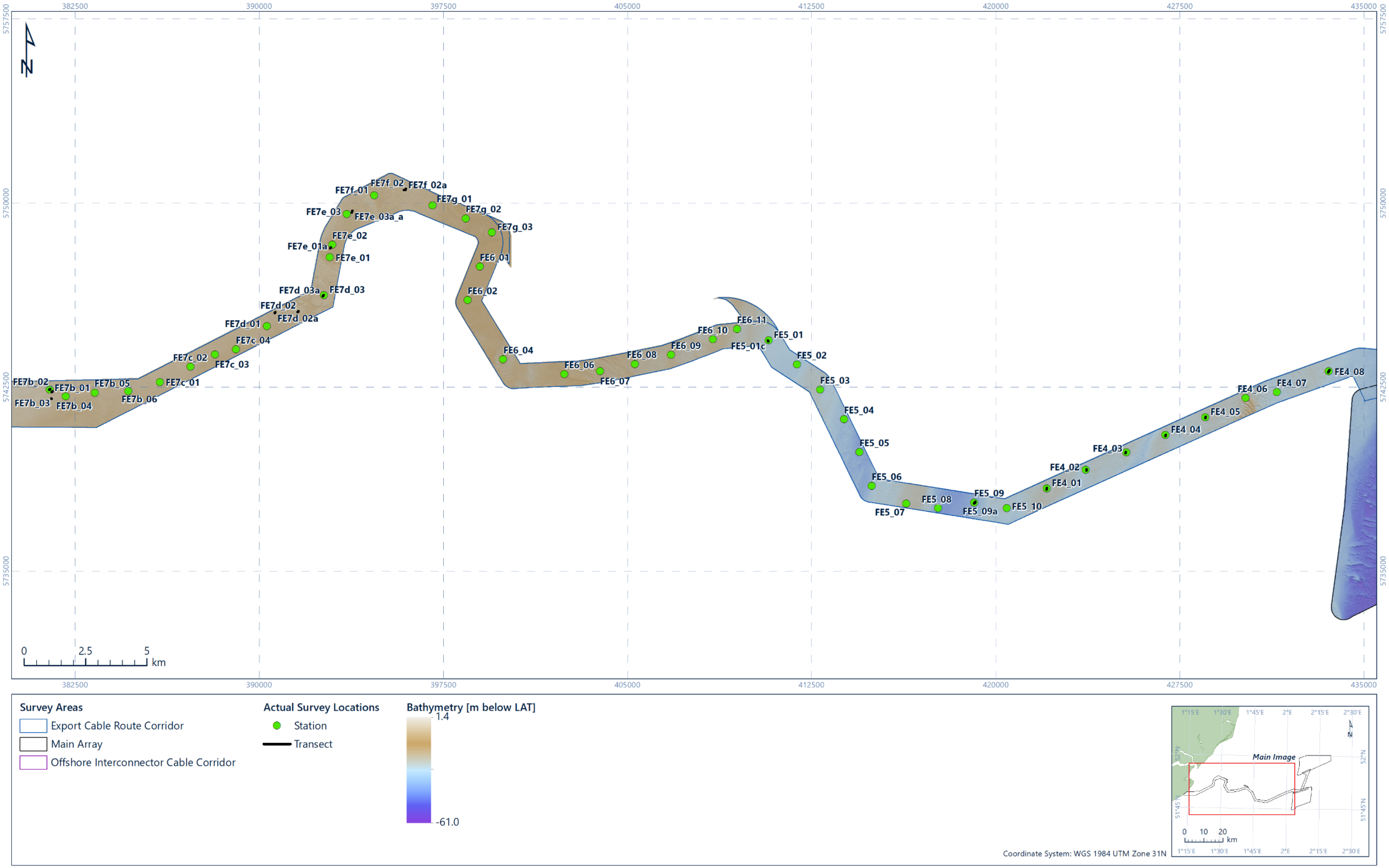
Stations FE6_05, FE7d_02 and FE7f_02 could not be successfully sampled due to the coarseness of the substrata.

Table 4.3: Completed subtidal sampling stations, Five Estuaries Offshore Site Investigation

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Depth [m BSL]	Sample Acquisition
Block FE4				
FE4_01	422 078.8	5 738 359.0	25	FA, PSD
FE4_02	423 674.4	5 739 131.5	29	FA, PSD
FE4_02_50 m	423 735.0	5 739 129.6	32	SC
FE4_03	425 320.9	5 739 835.5	26	FA, PSD
FE4_04	426 917.3	5 740 541.2	25	FA, PSD
FE4_05	428 539.4	5 741 265.1	25	FA, PSD, SC
FE4_06	430 185.9	5 742 055.0	20	FA, PSD
FE4_07	431 455.4	5 742 290.7	28	FA, PSD
FE4_08	433 573.9	5 743 137.9	30	FA, PSD
Block FE5				
FE5_01	410 746.6	5 744 408.1	29	FA, PSD
FE5_02	411 912.2	5 743 423.5	32	FA, PSD
FE5_03	412 846.6	5 742 397.9	26	FA, PSD
FE5_04	413 826.3	5 741 184.3	34	FA, PSD
FE5_05	414 455.6	5 739 845.1	40	FA, PSD
FE5_06	414 949.9	5 738 472.5	36	FA, PSD
FE5_07	416 356.7	5 737 746.5	24	FA, PSD
FE5_08	417 652.6	5 737 558.3	40	FA, PSD
FE5_09	419 128.1	5 737 791.1	39	FA, PSD, SC
FE5_10	420 459.5	5 737 566.0	29	FA, PSD
Block FE6				
FE6_01	398 985.2	5 747 405.1	15	FA, PSD
FE6_02	398 490.1	5 746 039.6	15	FA, PSD
FE6_04	399 938.6	5 743 631.8	17	FA, PSD
FE6_06	402 432.1	5 743 025.2	17	FA, PSD
FE6_07	403 878.5	5 743 139.3	20	FA, PSD
FE6_08	405 303.2	5 743 437.7	22	FA, PSD
FE6_09	406 767.5	5 743 814.2	20	FA, PSD
FE6_10	408 482.6	5 744 447.2	21	FA, PSD
FE6_11	409 467.8	5 744 861.7	23	FA, PSD
Block FE7				

Geodetic Parameters: WGS 84, UTM 31N, 3°E [m]				
Station	Easting	Northing	Depth [m BSL]	Sample Acquisition
FE7b_02	381 456.3	5 742 394.6	9	FA, PSD, SC
FE7b_04	382 114.7	5 742 115.2	8	FA, PSD, SC
FE7b_05	383 300.8	5 742 269.4	9	FA, PSD
FE7b_06	384 667.1	5 742 324.3	10	FA, PSD
FE7c_01	385 941.5	5 742 696.5	9	FA, PSD
FE7c_02	387 198.6	5 743 325.9	9	FA, PSD
FE7c_03	388 197.6	5 743 823.6	9	FA, PSD
FE7c_04	389 049.8	5 744 032.0	11	FA, PSD, SC
FE7d_01	390 302.2	5 744 980.6	9	FA, PSD
FE7d_03	392 631.5	5 746 248.7	10.5	FA, PSD
FE7e_01	392 869.0	5 747 787.2	12	FA, PSD
FE7e_02	392 971.9	5 748 305.2	12	FA, PSD, SC
FE7e_03	393 569.7	5 749 546.2	10.5	FA, PSD
FE7f_01	394 683.0	5 750 306.8	10	FA, PSD
FE7g_01	397 060.6	5 749 907.1	9	FA, PSD
FE7g_02	398 410.2	5 749 373.2	11	FA, PSD
FE7g_03	399 473.2	5 748 809.2	16	FA, PSD, SC

Notes
BSL = Below sea level
SC = Sediment chemistry
PSD = Particle size distribution
FA = Faunal sample A



Map Document: (S:\430-MGC-IT\Charting\E200867_RWE_FiveEstuaries\3_Plots\2_Draft\EBS\ECR\Q200867_03_ActualArray_ECR.mxd)
05/04/2022 - 00:38:56

Figure 4.1: Completed survey locations overlaid on bathymetry, export cable route, Five Estuaries Offshore Site Investigation

4.2 Sediment Characterisation

Results of the sediment PSD for the intertidal survey area and the ECR are presented in Sections 4.2.1and 4.2.2, respectively. Appendix D presents the details of particle size distribution for individual stations and the analysis certificates.

4.2.1 Intertidal

4.2.1.1 Univariate Analysis

Table 4.4 presents the sediment particle size characteristics and Table 4.5 presents the sediment particle distribution across the intertidal survey area. Figure 4.6 presents an overview of the variations of the fractional composition of the sediments. Figure 4.3 presents the Folk (BGS modified) sediment classification and Figure 4.4 presents the Wentworth (1922) sediment description, across the high water, mid water and low water mark.

Sand was the predominant sediment fraction across the intertidal survey area, with a content of 35.66 % (station I_TR07_HW) to 100.00 % (I_TR04_LW) and a mean of 80.32 %. Gravel was absent at station I_TR04_LW, and, at the remaining stations, gravel content ranged from 0.01 % (station I_TR07_LW) to 64.34 % (station I_TR07_HW). Fines were absent from the intertidal survey area at the time of the survey.

Three sediment classes were identified through the Folk (BGS modified) classification (Table 4.4 and Figure 4.3), including:

1. 'Sand', which typified nine stations,
2. 'Gravelly sand', which typified eight stations and
3. 'Sandy gravel', which typified six stations.

Of the 23 stations sampled across the intertidal area, 12 had unimodal distributions, 2 had bimodal distributions and 9 had polymodal distributions (Table 4.5). Investigation of the particle size graphs (Appendix D) indicated that the most frequently occurring peak in the first mode were the 301.8 µm and the 426.8 µm sediment particle sizes, both within the medium sand range. Peaks in the 603.5 µm (very coarse sand), 6800 µm (fine pebble), 26 950 µm (coarse pebble) and 38 250 µm (very coarse pebble) were recorded at individual stations. The 6800 µm (fine pebble) and the 13 600 µm (medium pebble), were the most frequently occurring peaks in the second mode. The 13 600 µm sediment particle size was also the most frequently occurring in the third mode, along with the 2400 µm (granule) and the 4800 µm (fine pebble) sediment particle sizes.

The median sediment particle size ranged from 279 µm (medium sand) (stations I_TR04_LW and I_TR05_LW) to 6491 µm (fine pebble) (station I_TR07_HW) with a mean of 1206 µm (very coarse sand) and a median of 389 µm (medium sand). The median sediment particle size at stations from high and mid water varied more compared to that of stations at low water (Table 4.5).

The mean sediment particle size underpinned the Wentworth (1922) description, through which five grain size classes were identified (Table 4.5 and Figure 4.4), including:

1. ‘Medium sand’, which typified 11 stations;
2. ‘Coarse sand’, which typified 6 stations;
3. ‘Very coarse sand’, which typified 2 stations
4. ‘Granule’, which typified 3 stations;
5. ‘Pebble’, which typified 1 station.

Of the 23 stations investigated, 9 had well sorted sediment, 7 had poorly sorted sediment, 5 had very poorly sorted sediment and 2 had moderately sorted sediment (Table 4.5).

Sediment distribution was symmetrical at 9 stations, very coarse skewed at 8 stations, fine skewed at 5 stations and coarse skewed at 1 station (Table 4.5).

4.2.1.2 Redox

Values of redox, where measured, ranged from 120 mV (temperature corrected) (core station I_TR05_MW) to 424 mV (temperature corrected) (core station I_TR04_MW). On site observations indicated the presence of anoxia at depth greater than 10 cm at six core stations (Appendix C.1).

Table 4.4: Summary of sediment characteristics, intertidal area, Five Estuaries Offshore Site Investigation

Station	Fractional Composition			Fines		Folk Description (BGS modified)
	Gravel [%]	Sand [%]	Fines [%]	Silt [%]	Clay [%]	
High Water						
I_TR01_HW	9.36	90.64	0.00	0.00	0.00	Gravelly sand
I_TR02_HW	5.02	94.98	0.00	0.00	0.00	Gravelly sand
I_TR03_HW	50.88	49.12	0.00	0.00	0.00	Sandy gravel
I_TR04_HW	0.14	99.86	0.00	0.00	0.00	Sand
I_TR05_HW	0.77	99.23	0.00	0.00	0.00	Sand
I_TR07_HW	64.34	35.66	0.00	0.00	0.00	Sandy gravel
I_TR08_HW	60.87	39.13	0.00	0.00	0.00	Sandy gravel
Mid Water						
I_TR01_MW	62.74	37.26	0.00	0.00	0.00	Sandy gravel
I_TR02_MW	15.30	84.70	0.00	0.00	0.00	Gravelly sand
I_TR03_MW	57.53	42.47	0.00	0.00	0.00	Sandy gravel
I_TR04_MW	0.64	99.36	0.00	0.00	0.00	Sand
I_TR05_MW	42.85	57.15	0.00	0.00	0.00	Sandy gravel
I_TR06_MW	0.02	99.98	0.00	0.00	0.00	Sand
I_TR07_MW	7.50	92.50	0.00	0.00	0.00	Gravelly sand
I_TR08_MW	10.97	89.03	0.00	0.00	0.00	Gravelly sand
Low Water						
I_TR01_LW	0.02	99.98	0.00	0.00	0.00	Sand
I_TR02_LW	20.47	79.53	0.00	0.00	0.00	Gravelly sand
I_TR03_LW	18.49	81.51	0.00	0.00	0.00	Gravelly sand
I_TR04_LW	0.00	100.00	0.00	0.00	0.00	Sand
I_TR05_LW	0.02	99.98	0.00	0.00	0.00	Sand
I_TR06_LW	0.77	99.23	0.00	0.00	0.00	Sand
I_TR07_LW	0.01	99.99	0.00	0.00	0.00	Sand
I_TR08_LW	23.86	76.14	0.00	0.00	0.00	Gravelly sand
Minimum	**0.00**	**35.66**	**0.00**	**0.00**	**0.00**	-
Maximum	**64.34**	**100.00**	**0.00**	**0.00**	**0.00**	
Median	**9.36**	**90.64**	**0.00**	**0.00**	**0.00**	
Mean	**19.68**	**80.32**	**0.00**	**0.00**	**0.00**	

Station	Fractional Composition			Fines		Folk Description (BGS modified)
	Gravel [%]	Sand [%]	Fines [%]	Silt [%]	Clay [%]	
Standard Deviation	23.80	23.80	0.00	0.00	0.00	

Notes:
BGS = British Geological Survey
Fines = silt and clay content
Silt = < 4.0 phi to +8.0 phi (<62.5 µm to 3.9 µm)
Clay = < 8.0 phi to +10.0 phi (< 3.9 µm to < 0.04 µm)

Table 4.5: Summary of particle size distribution, intertidal area, Five Estuaries Offshore Site Investigation

Station	Modality	Median [µm]	Mean Particle Size			Sorting Coefficient		Skewness	
			[µm]	[phi]	Wentworth (1922) Description	[µm]	Description	[µm]	Description
High Water									
I_TR01_HW	Unimodal	544	0.82	567	Coarse Sand	1.98	Moderately Sorted	0.34	Very Coarse Skewed
I_TR02_HW	Unimodal	504	0.97	512	Coarse Sand	1.72	Moderately Sorted	0.20	Coarse Skewed
I_TR03_HW	Polymodal	2194	−0.90	1870	Very Coarse Sand	4.14	Very Poorly Sorted	−0.12	Fine Skewed
I_TR04_HW	Unimodal	306	1.70	307	Medium Sand	1.37	Well Sorted	0.00	Symmetrical
I_TR05_HW	Unimodal	320	1.61	327	Medium Sand	1.34	Well Sorted	0.05	Symmetrical
I_TR07_HW	Polymodal	6491	−2.06	4174	Pebble	6.79	Very Poorly Sorted	−0.29	Fine Skewed
I_TR08_HW	Polymodal	5090	−1.80	3476	Granule	5.90	Very Poorly Sorted	−0.27	Fine Skewed
Mid Water									
I_TR01_MW	Polymodal	3606	−1.59	3014	Granule	3.80	Poorly Sorted	−0.17	Fine Skewed
I_TR02_MW	Polymodal	503	0.65	639	Coarse Sand	2.63	Poorly Sorted	0.41	Very Coarse Skewed
I_TR03_MW	Polymodal	3356	−1.43	2686	Granule	5.06	Very Poorly Sorted	−0.15	Fine Skewed
I_TR04_MW	Unimodal	309	1.69	311	Medium Sand	1.38	Well Sorted	0.02	Symmetrical
I_TR05_MW	Polymodal	667	−0.24	1179	Very Coarse Sand	4.65	Very Poorly Sorted	0.47	Very Coarse Skewed
I_TR06_MW	Unimodal	304	1.71	306	Medium Sand	1.35	Well Sorted	0.01	Symmetrical
I_TR07_MW	Unimodal	317	1.62	324	Medium Sand	2.05	Poorly Sorted	0.39	Very Coarse Skewed
I_TR08_MW	Bimodal	313	1.63	323	Medium Sand	2.34	Poorly Sorted	0.43	Very Coarse Skewed
Low Water									
I_TR01_LW	Unimodal	327	1.60	329	Medium Sand	1.40	Well Sorted	0.03	Symmetrical
I_TR02_LW	Bimodal	571	0.28	822	Coarse Sand	3.85	Poorly Sorted	0.51	Very Coarse Skewed
I_TR03_LW	Polymodal	483	0.57	676	Coarse Sand	3.34	Poorly Sorted	0.51	Very Coarse Skewed
I_TR04_LW	Unimodal	279	1.87	273	Medium Sand	1.33	Well Sorted	−0.03	Symmetrical
I_TR05_LW	Unimodal	279	1.87	273	Medium Sand	1.33	Well Sorted	−0.03	Symmetrical
I_TR06_LW	Unimodal	307	1.69	309	Medium Sand	1.36	Well Sorted	0.01	Symmetrical
I_TR07_LW	Unimodal	289	1.81	286	Medium Sand	1.34	Well Sorted	−0.01	Symmetrical
I_TR08_LW	Polymodal	389	0.61	656	Coarse Sand	3.51	Poorly Sorted	0.56	Very Coarse Skewed
Minimum	-	**279**	**−2.06**	**273**	-	**1.33**	-	**−0.29**	-
Maximum		**6491**	**1.87**	**4174**		**6.79**		**0.56**	
Median		**389**	**0.97**	**512**		**2.05**		**0.02**	

Station	Modality	Median [µm]	Mean Particle Size			Sorting Coefficient		Skewness	
			[µm]	[phi]	Wentworth (1922) Description	[µm]	Description	[µm]	Description
Mean		1206	0.64	1028		2.78		0.12	
Standard Deviation		1740	1.32	1167		1.65		0.27	

Notes
Statistics based on Folk and Ward (1957) method derived in Gradistat (Blott, 2010)

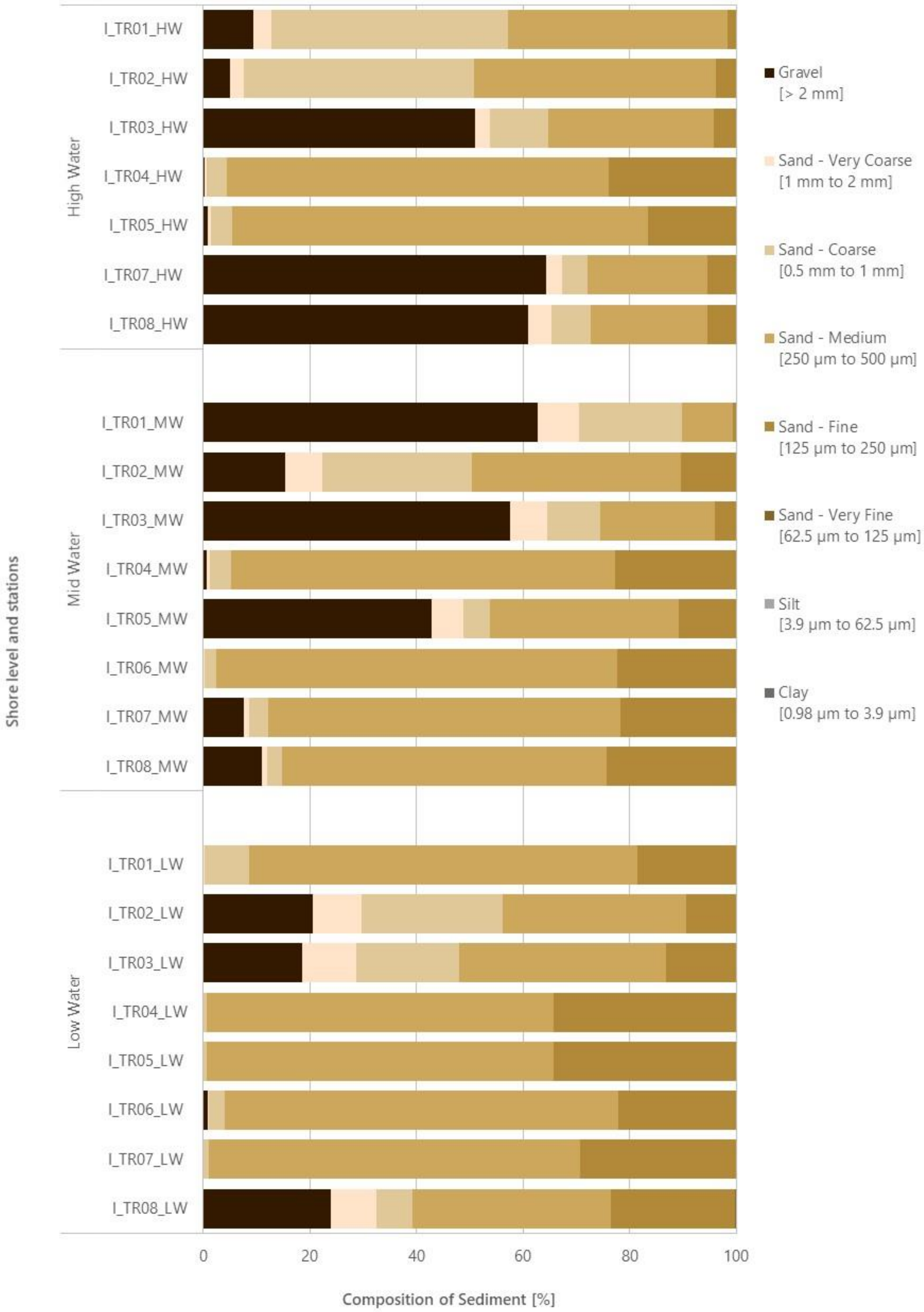
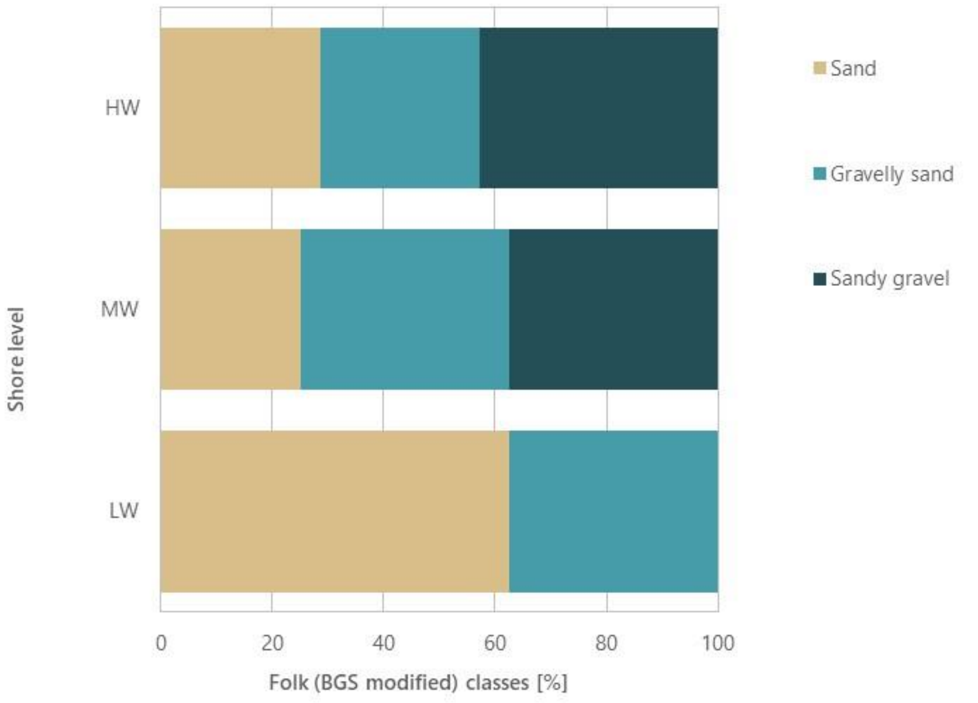
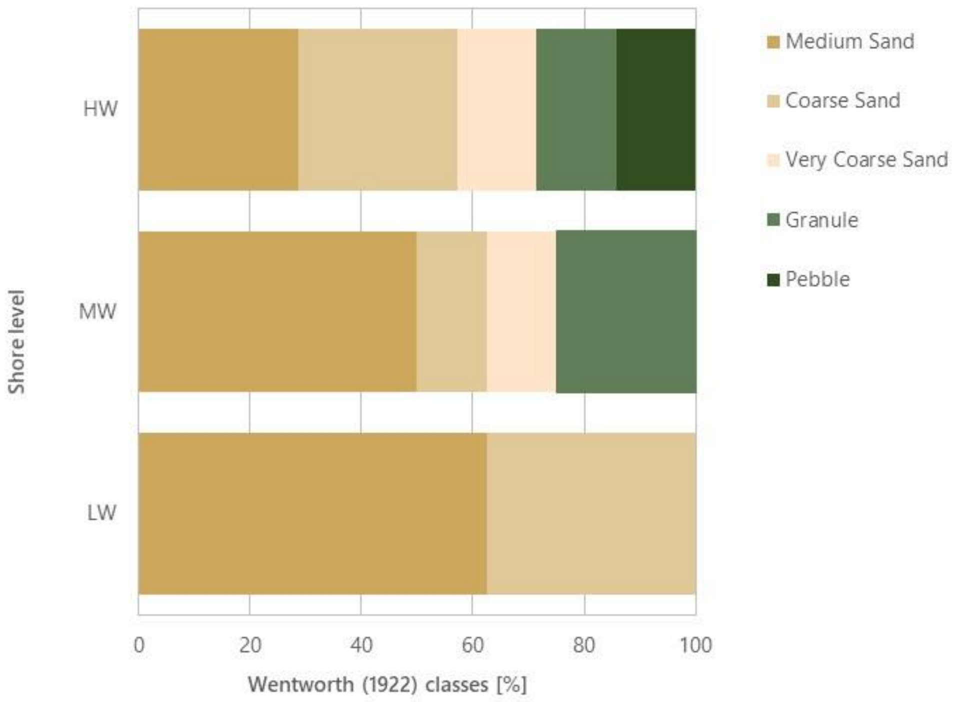


Figure 4.2: Sediment fractional composition, intertidal area, Five Estuaries Offshore Site Investigation



Notes
BGS = British Geological Survey
HW = High water MW = Mid water LW = Low water

Figure 4.3: Folk (BGS modified) sediment description, intertidal area, Five Estuaries Offshore Site Investigation



Notes
HW = High water MW = Mid water LW = Low water

Figure 4.4: Wentworth (1922) sediment description, intertidal area, Five Estuaries Offshore Site Investigation

4.2.2 Export Cable Route

4.2.2.1 Univariate Analysis

Table 4.6 presents the sediment particle size characteristics and Table 4.7 presents the sediment particle distribution of sediment samples along the ECR. Figure 4.5 presents an overview of the variations of the fractional composition of the sediments. Figure 4.6 presents the spatial variation of percentage sand, gravel and fines, whereas Figure 4.7 presents the spatial variations of the median sediment particle size along the ECR. Figure 4.8 present the Folk (BGS modified) sediment classification and Figure 4.9 presents the Wentworth (1922) sediment descriptions within each survey block along the ECR.

Sediment along the ECR comprised a mix of sand, gravel and fines (or mud). Sand content ranged from 11.64 % (station FE7c_01) to 97.30 % (station FE6_08), with a mean of 40.51 %. Gravel content ranged from 0.07 % (station FE7e_02) to 82.14 % (station FE7c_01), with a mean of 37.25 %. Fines were absent from stations FE4_06, FE6_07 and FE6_08; at the remaining stations, fines content ranged from 0.45 % (station FE7f_01) to 84.15 % (station FE7b_04), with a mean of 22.24 % (Table 4.6 and Figure 4.6). Of the fines, the silt content was consistently higher than the clay content (Table 4.6 and Figure 4.5).

Ten sediment classes were identified using the Folk (BGS modified) classification (Table 4.6 and Figure 4.8), including:

1. 'Muddy, sandy gravel', which typified 14 stations;
2. 'Sandy gravel', which typified 7 stations;
3. 'Gravelly mud', which typified 5 stations;
4. 'Gravelly muddy sand', which typified 5 stations;
5. 'Gravelly sand', which typified 3 stations;
6. 'Muddy gravel', which typified 3 stations;
7. 'Muddy sand', which typified 3 stations;
8. 'Sandy mud', which typified 2 stations;
9. 'Gravel', which typified 1 station;
10. 'Sand', which typified 1 station.

Of the 44 stations investigated, 24 had polymodal distributions, 14 had bimodal distributions and 6 had unimodal distributions (Table 4.7). Investigation of the particle size cumulative graphs (Appendix D) indicated that the most frequently occurring peak in the first mode was the 26 950 µm sediment particle size (coarse pebble) followed by the 426.8 µm (medium sand) and the 38 250 µm (very coarse pebble) sediment particle sizes. The 13 600 µm (coarse pebble) and the 9600 µm (medium pebble) were the most frequently occurring peaks in the second mode, followed by the 603.6 µm (coarse sand), sediment particle sizes. The 603.5 µm was the most frequently occurring peak also in the third mode, along with the 6.65 µm (very fine silt) sediment particle sizes, followed by the 6800 µm (fine pebble) sediment particle size.

The median sediment particle size ranged from 10 µm (fine silt) (station FE5_09) to 33 003 µm (very coarse pebble) (station FE7c_01), with a mean of 4589 (fine pebble) and a median of 754 (coarse sand). The median sediment particle size at stations in block FE5 had the greatest variation, with a range of 10 µm to 6859 µm (Table 4.7).

The mean sediment particle size underpinned the Wentworth (1922) description, through which nine grain size classes were identified (Table 4.7 and Figure 4.9), including:

1. 'Granule', which typified eight stations;
2. 'Very coarse sand', which typified seven stations
3. 'Coarse sand', which typified seven stations;
4. 'Pebble', which typified six stations;
5. 'Very fine sand', which typified five stations;
6. 'Medium sand', which typified four stations;
7. 'Coarse silt', which typified three stations;
8. 'Fine sand', which typified two stations;
9. 'Fine silt', which typified one station;
10. 'Medium silt,' which typified one station.

Of the 44 stations investigated, 25 had very poorly sorted sediments, 15 had extremely poorly sorted sediments, 2 had poorly sorted sediment, 1 had moderately sorted sediment and 1 had moderately well sorted sediment. On average, stations in blocks FE4 and FE5 had extremely poorly sorted sediments, whereas stations in block FE6 and FE7 had very poorly sorted sediments (Table 4.7).

Sediment particle distribution was very fine skewed at 23 stations, very coarse skewed at 6 stations, symmetrical at 6 stations, fine skewed at 5 stations and coarse skewed at 4 stations (Table 4.7).

Table 4.6: Summary of sediment characteristics, export cable route, Five Estuaries Offshore Site Investigation

Station	Fractional Composition			Fines		Folk Description (BGS modified)
	Gravel [%]	Sand [%]	Fines [%]	Silt [%]	Clay [%]	
Block FE4						
FE4_01	52.66	19.17	28.17	16.39	11.80	Muddy gravel
FE4_02	30.76	54.42	14.82	9.13	5.70	Muddy, sandy gravel
FE4_03	47.61	24.78	27.60	17.39	10.24	Muddy gravel
FE4_04	32.17	51.16	16.66	10.75	5.94	Muddy, sandy gravel
FE4_05	59.57	31.90	8.53	5.19	3.35	Muddy, sandy gravel
FE4_06	30.70	69.30	0.00	0.00	0.00	Sandy gravel
FE4_07	57.43	31.64	10.94	6.46	4.49	Muddy, sandy gravel
FE4_08	18.44	49.35	32.20	19.62	12.62	Gravelly muddy sand
Block FE5						
FE5_01	31.55	42.86	25.59	17.74	7.89	Muddy, sandy gravel
FE5_02	17.15	14.02	68.83	47.24	21.64	Gravelly mud
FE5_03	18.84	34.54	46.62	28.61	18.05	Gravelly mud
FE5_04	28.88	51.59	19.53	12.30	7.27	Gravelly muddy sand
FE5_05	59.95	30.65	9.40	6.33	3.09	Muddy, sandy gravel
FE5_06	29.78	48.78	21.44	13.34	8.11	Gravelly muddy sand
FE5_07	49.02	33.99	16.99	10.17	6.83	Muddy, sandy gravel
FE5_08	27.61	12.23	60.16	37.51	22.70	Gravelly mud
FE5_09	9.26	19.67	71.07	41.53	29.58	Gravelly mud
FE5_10	18.81	59.51	21.68	13.26	8.43	Gravelly muddy sand
Block FE6						
FE6_01	69.40	23.66	6.93	4.99	1.97	Muddy, sandy gravel
FE6_02	76.41	19.08	4.50	3.19	1.34	Muddy, sandy gravel
FE6_04	58.98	38.89	2.13	1.55	0.59	Sandy gravel
FE6_06	27.82	71.60	0.58	0.43	0.15	Gravelly sand
FE6_07	14.52	85.48	0.00	0.00	0.00	Gravelly sand
FE6_08	2.70	97.30	0.00	0.00	0.00	Sand

Station	Fractional Composition			Fines		Folk Description (BGS modified)
	Gravel [%]	Sand [%]	Fines [%]	Silt [%]	Clay [%]	
FE6_09	38.92	60.15	0.93	0.63	0.30	Sandy gravel
FE6_10	66.22	32.09	1.69	1.15	0.54	Sandy gravel
FE6_11	25.55	69.52	4.93	3.28	1.66	Gravelly sand
Block FE7						
FE7b_02	22.95	33.64	43.42	32.75	10.81	Gravelly mud
FE7b_04	2.79	13.06	84.15	60.62	23.65	Sandy mud
FE7b_05	43.42	24.18	32.40	24.58	7.92	Muddy gravel
FE7b_06	11.73	43.92	44.35	32.52	11.97	Gravelly muddy sand
FE7c_01	82.14	11.64	6.22	4.56	1.68	Gravel
FE7c_02	54.12	27.01	18.87	13.66	5.29	Muddy, sandy gravel
FE7c_03	59.20	26.79	14.00	10.36	3.69	Muddy, sandy gravel
FE7c_04	0.07	50.92	49.01	38.79	10.47	Muddy sand
FE7d_01	51.92	27.12	20.96	15.36	5.67	Muddy, sandy gravel
FE7d_03	72.39	26.08	1.53	1.33	0.22	Sandy gravel
FE7e_01	61.08	27.63	11.29	8.26	3.08	Muddy, sandy gravel
FE7e_02	0.07	46.31	53.62	41.73	12.02	Sandy mud
FE7e_03	51.97	40.58	7.45	5.84	1.63	Muddy, sandy gravel
FE7f_01	55.98	43.58	0.45	0.33	0.12	Sandy gravel
FE7g_01	68.01	30.68	1.30	1.07	0.24	Sandy gravel
FE7g_02	0.16	65.12	34.72	27.14	7.68	Muddy sand
FE7g_03	0.45	66.84	32.71	25.48	7.29	Muddy sand
Minimum	**0.07**	**11.64**	**0.00**	**0.00**	**0.00**	-
Maximum	**82.14**	**97.30**	**84.15**	**60.62**	**29.58**	
Median	**31.86**	**34.27**	**16.82**	**10.56**	**5.69**	
Mean	**37.25**	**40.51**	**22.24**	**15.28**	**6.99**	
Standard Deviation	**23.72**	**20.10**	**21.73**	**15.12**	**7.14**	

Notes:
BGS = British Geological Survey
Fines = silt and clay content	Silt = < 4.0 phi to +8.0 phi (< 62.5 µm to 3.9 µm)	Clay = < 8.0 phi to +10.0 phi (< 3.9 µm to < 0.04 µm)

Table 4.7: Summary of particle size distribution, export cable route, Five Estuaries Offshore Site Investigation

Station	Modality	Median [µm]	Mean Particle Size			Sorting Coefficient		Skewness	
			[µm]	[phi]	Wentworth (1922) Description	[µm]	Description	[µm]	Description
Block FE4									
FE4_01	Bimodal	3938	977	0.03	Coarse Sand	41.01	Extremely Poorly Sorted	−0.51	Very Fine Skewed
FE4_02	Polymodal	684	1003	0.00	Very Coarse Sand	10.00	Very Poorly Sorted	0.02	Symmetrical
FE4_03	Polymodal	1313	651	0.62	Coarse Sand	32.74	Extremely Poorly Sorted	−0.31	Very Fine Skewed
FE4_04	Polymodal	707	893	0.16	Coarse Sand	17.94	Extremely Poorly Sorted	−0.04	Symmetrical
FE4_05	Bimodal	12326	5229	−2.39	Pebble	10.09	Very Poorly Sorted	−0.70	Very Fine Skewed
FE4_06	Bimodal	956	1318	−0.40	Very Coarse Sand	2.91	Poorly Sorted	0.51	Very Coarse Skewed
FE4_07	Bimodal	5882	3563	−1.83	Granule	11.94	Very Poorly Sorted	−0.48	Very Fine Skewed
FE4_08	Polymodal	541	195	2.36	Fine Sand	16.83	Extremely Poorly Sorted	−0.43	Very Fine Skewed
Block FE5									
FE5_01	Polymodal	439	352	1.50	Medium Sand	21.43	Extremely Poorly Sorted	−0.12	Fine Skewed
FE5_02	Polymodal	13	48	4.37	Coarse Silt	22.78	Extremely Poorly Sorted	0.54	Very Coarse Skewed
FE5_03	Polymodal	153	125	3.01	Very Fine Sand	23.20	Extremely Poorly Sorted	−0.09	Symmetrical
FE5_04	Polymodal	557	458	1.13	Medium Sand	14.32	Very Poorly Sorted	−0.20	Fine Skewed
FE5_05	Polymodal	6859	3941	−1.98	Granule	9.71	Very Poorly Sorted	−0.53	Very Fine Skewed
FE5_06	Polymodal	447	394	1.35	Medium Sand	19.57	Extremely Poorly Sorted	−0.12	Fine Skewed
FE5_07	Polymodal	1638	1033	−0.05	Very Coarse Sand	17.62	Extremely Poorly Sorted	−0.33	Very Fine Skewed
FE5_08	Polymodal	19	71	3.82	Very Fine Sand	28.82	Extremely Poorly Sorted	0.45	Very Coarse Skewed
FE5_09	Polymodal	10	25	5.33	Medium Silt	16.74	Extremely Poorly Sorted	0.44	Very Coarse Skewed
FE5_10	Polymodal	426	257	1.96	Medium Sand	14.19	Very Poorly Sorted	−0.26	Fine Skewed
Block FE6									
FE6_01	Polymodal	11187	3668	−1.88	Granule	9.70	Very Poorly Sorted	−0.71	Very Fine Skewed
FE6_02	Bimodal	22397	8904	−3.15	Pebble	8.75	Very Poorly Sorted	−0.65	Very Fine Skewed
FE6_04	Bimodal	4907	3158	−1.66	Granule	4.99	Very Poorly Sorted	−0.38	Very Fine Skewed
FE6_06	Unimodal	1289	1347	−0.43	Very Coarse Sand	1.92	Moderately Sorted	0.12	Coarse Skewed
FE6_07	Unimodal	669	777	0.36	Coarse Sand	2.34	Poorly Sorted	0.36	Very Coarse Skewed
FE6_08	Unimodal	801	791	0.34	Coarse Sand	1.58	Moderately Well Sorted	−0.04	Symmetrical
FE6_09	Bimodal	587	1237	−0.31	Very Coarse Sand	5.48	Very Poorly Sorted	0.53	Very Coarse Skewed

Station	Modality	Median [µm]	Mean Particle Size			Sorting Coefficient		Skewness	
			[µm]	[phi]	Wentworth (1922) Description	[µm]	Description	[µm]	Description
FE6_10	Bimodal	17111	5283	−2.40	Pebble	8.71	Very Poorly Sorted	−0.69	Very Fine Skewed
FE6_11	Polymodal	699	998	0.00	Coarse Sand	4.77	Very Poorly Sorted	0.23	Coarse Skewed
Block FE7									
FE7b_02	Polymodal	88	140	2.84	Fine Sand	19.82	Extremely Poorly Sorted	0.17	Coarse Skewed
FE7b_04	Unimodal	11	12	6.36	Fine Silt	5.67	Very Poorly Sorted	0.22	Coarse Skewed
FE7b_05	Polymodal	534	534	0.91	Coarse Sand	28.84	Extremely Poorly Sorted	−0.07	Symmetrical
FE7b_06	Polymodal	88	78	3.68	Very Fine Sand	12.51	Very Poorly Sorted	−0.02	Symmetrical
FE7c_01	Unimodal	33003	10065	−3.33	Pebble	7.78	Very Poorly Sorted	−0.91	Very Fine Skewed
FE7c_02	Polymodal	4766	1565	−0.65	Very Coarse Sand	16.45	Extremely Poorly Sorted	−0.61	Very Fine Skewed
FE7c_03	Bimodal	6843	2355	−1.24	Granule	15.38	Very Poorly Sorted	−0.61	Very Fine Skewed
FE7c_04	Bimodal	64	37	4.76	Coarse Silt	4.18	Very Poorly Sorted	−0.54	Very Fine Skewed
FE7d_01	Bimodal	3419	1382	−0.47	Very Coarse Sand	21.09	Extremely Poorly Sorted	−0.47	Very Fine Skewed
FE7d_03	Bimodal	22874	7579	−2.92	Pebble	5.93	Very Poorly Sorted	−0.79	Very Fine Skewed
FE7e_01	Unimodal	12278	3043	−1.61	Granule	12.99	Very Poorly Sorted	−0.80	Very Fine Skewed
FE7e_02	Bimodal	50	35	4.83	Coarse Silt	5.11	Very Poorly Sorted	−0.31	Very Fine Skewed
FE7e_03	Bimodal	3609	2699	−1.43	Granule	10.12	Very Poorly Sorted	−0.29	Fine Skewed
FE7f_01	Polymodal	8094	3423	−1.78	Granule	7.26	Very Poorly Sorted	−0.53	Very Fine Skewed
FE7g_01	Polymodal	9279	5499	−2.46	Pebble	6.60	Very Poorly Sorted	−0.39	Very Fine Skewed
FE7g_02	Polymodal	185	90	3.48	Very Fine Sand	6.05	Very Poorly Sorted	−0.55	Very Fine Skewed
FE7g_03	Polymodal	194	89	3.49	Very Fine Sand	5.60	Very Poorly Sorted	−0.62	Very Fine Skewed
Minimum	-	**10**	**12**	**−3.33**	-	**1.58**	-	**−0.91**	-
Maximum		**33003**	**10065**	**6.36**		**41.01**		**0.54**	
Median		**754**	**987**	**0.02**		**10.10**		**−0.31**	
Mean		**4589**	**1939**	**0.55**		**12.99**		**−0.24**	
Standard Deviation		**7292**	**2461**	**2.54**		**8.87**		**0.40**	

Notes
Statistics based on Folk and Ward (1957) method derived in Gradistat (Blott, 2010)

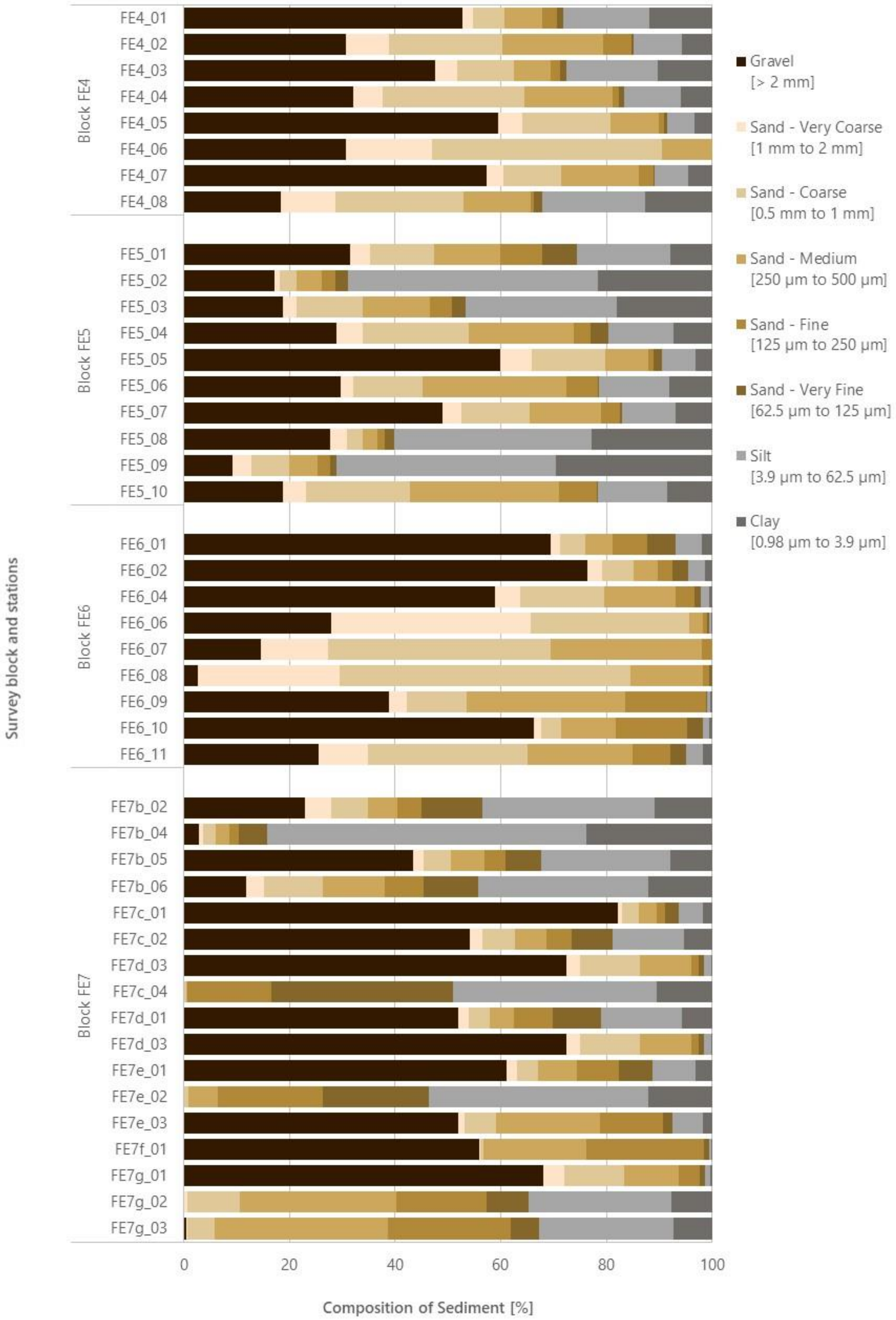


Figure 4.5: Sediment fractional composition, export cable route, Five Estuaries Offshore Site Investigation

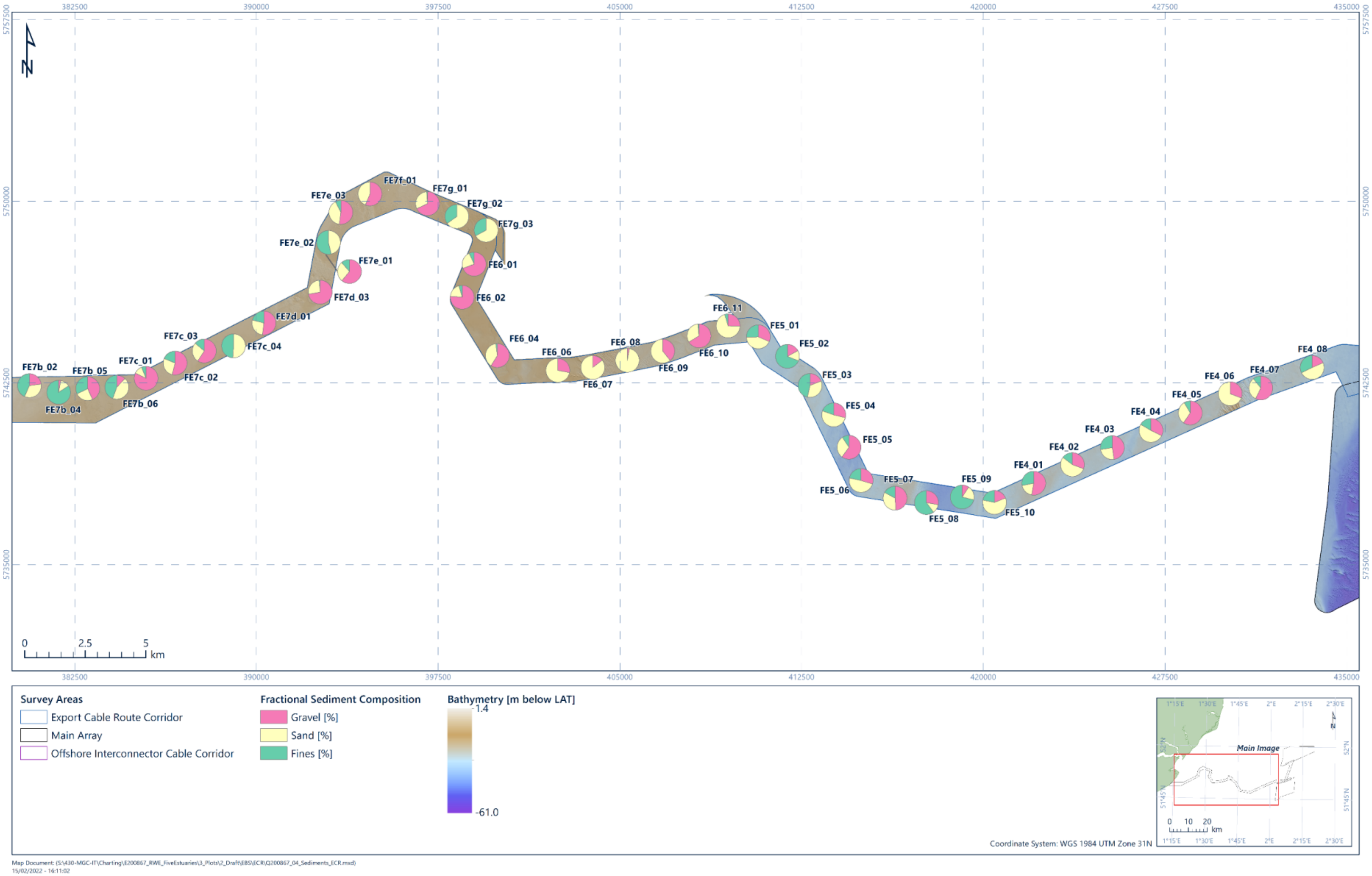


Figure 4.6: Spatial variations of percentage of sand, gravel and fines, export cable route, Five Estuaries Offshore Site Investigation

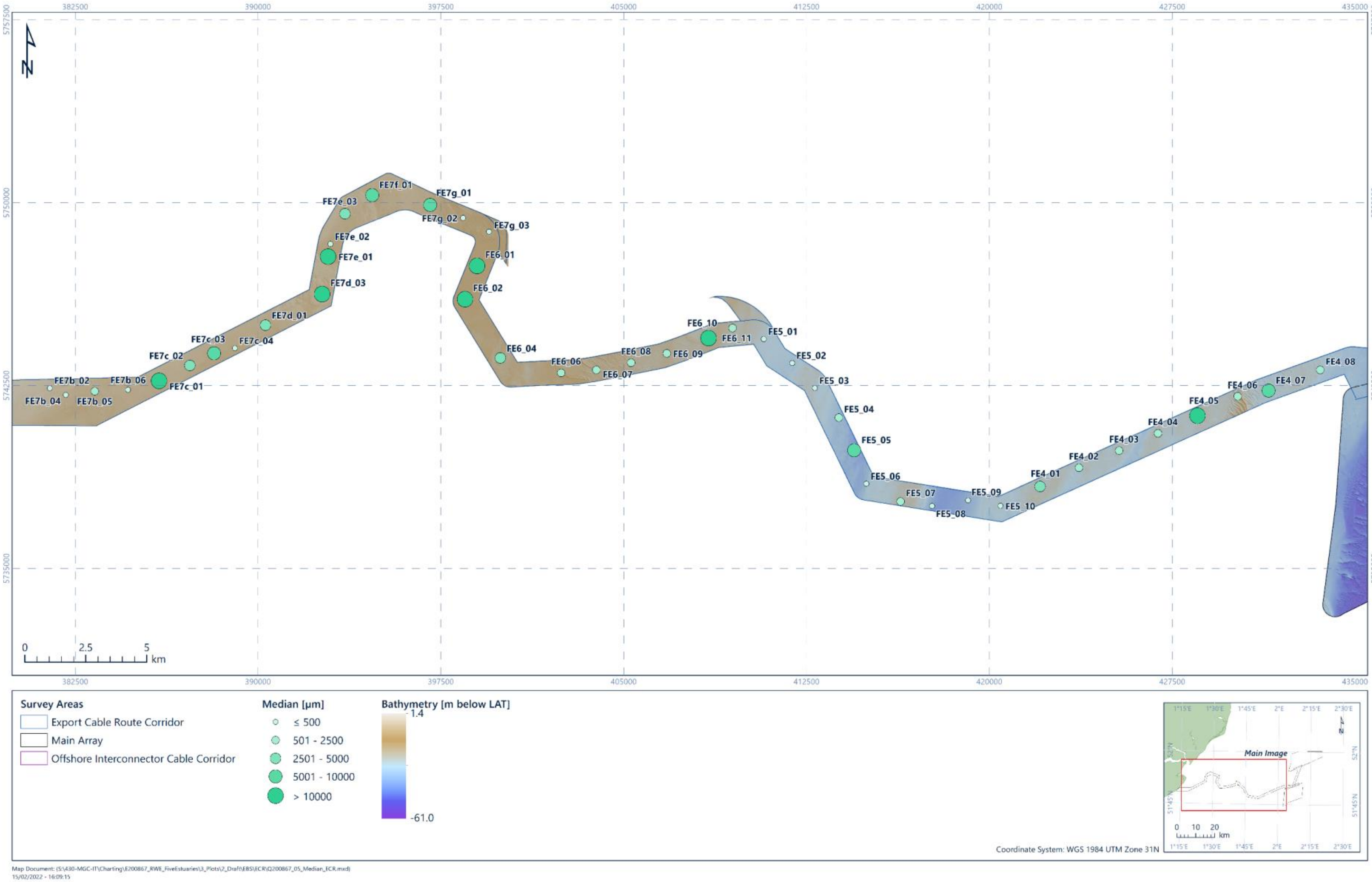
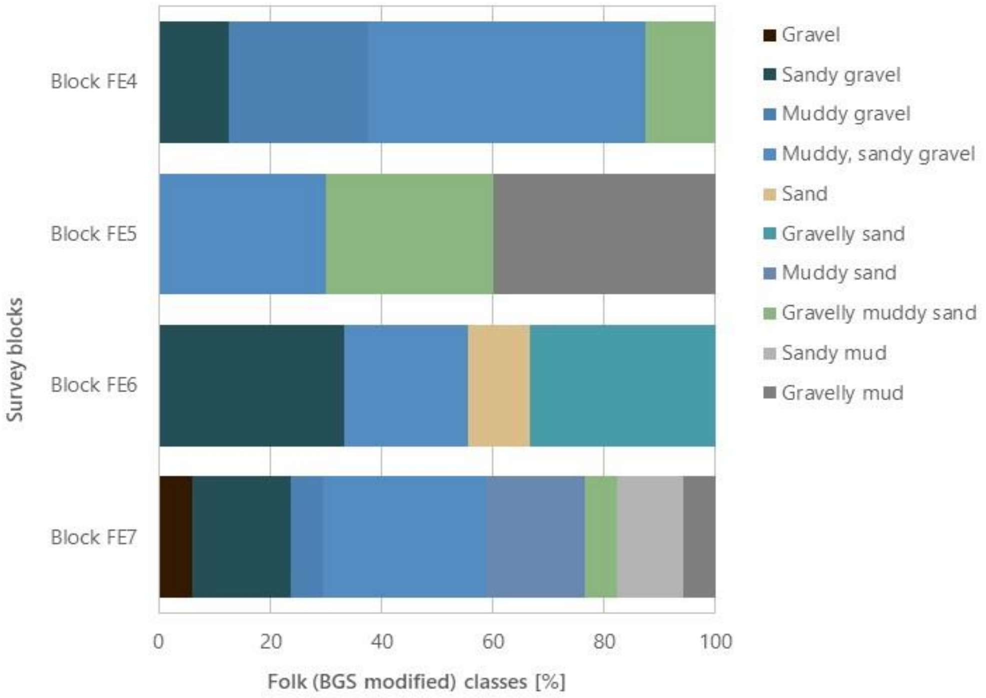


Figure 4.7: Spatial variations of the median [µm] sediment particle size, export cable route, Five Estuaries Offshore Site Investigation



Notes
BGS = British Geological Survey

Figure 4.8: Folk (BGS modified) sediment description, export cable route, Five Estuaries Offshore Site Investigation

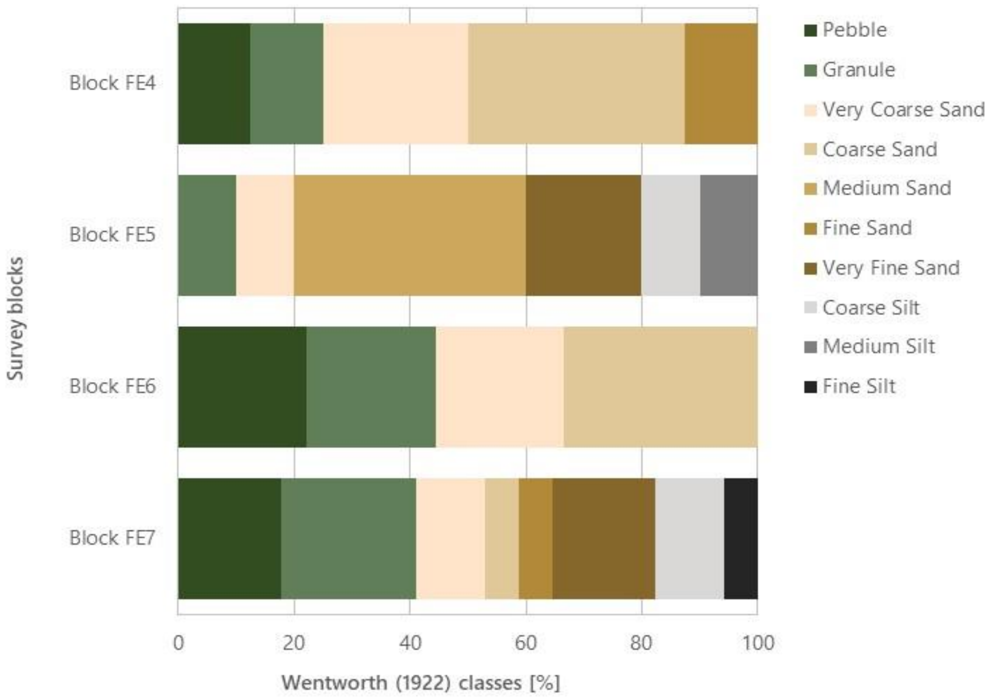


Figure 4.9: Wentworth (1922) sediment description, export cable route, Five Estuaries Offshore Site Investigation

4.2.3 Investigation of Granulometric Similarities

The cluster analysis, using Euclidean distance, was applied to the sediment PSD along the ECR to investigate sedimentological characteristics. Data were fourth root transformed. The SIMPROF test, undertaken in conjunction with the cluster analysis, was interpreted in ecological terms and, where appropriate, coarser groups were created (see Section 3.3.5). Figure 4.10 presents the dendrogram and the nMDS of the Euclidean distance matrix of sediment particle size.

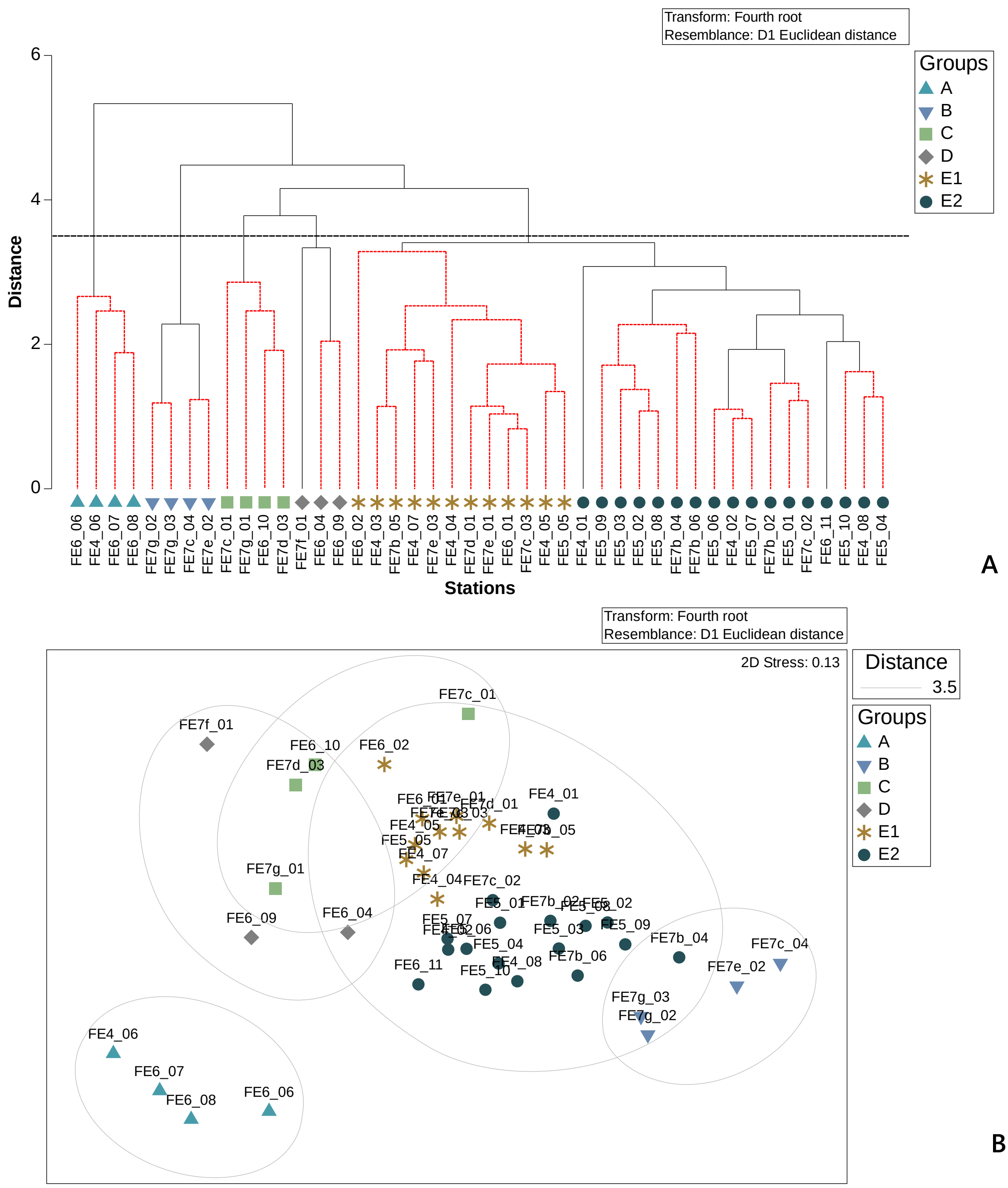


Figure 4.10: (A) dendrogram and (B) nMDS of hierarchical clustering analysis of sediment particle size, export cable route, Five Estuaries Offshore Site Investigation

Five multivariate groups were identified at the Euclidean distance of 3.5, namely A, B, C, D and E. Group E was further split into groups E1 and E2 at Euclidean distance of 3.3. Groups which separated below the 3.3 Euclidean distance were not deemed of ecological significance. Table 4.8 summarises the mean physical characteristics of the sediment groups identified through the multivariate analysis which included:

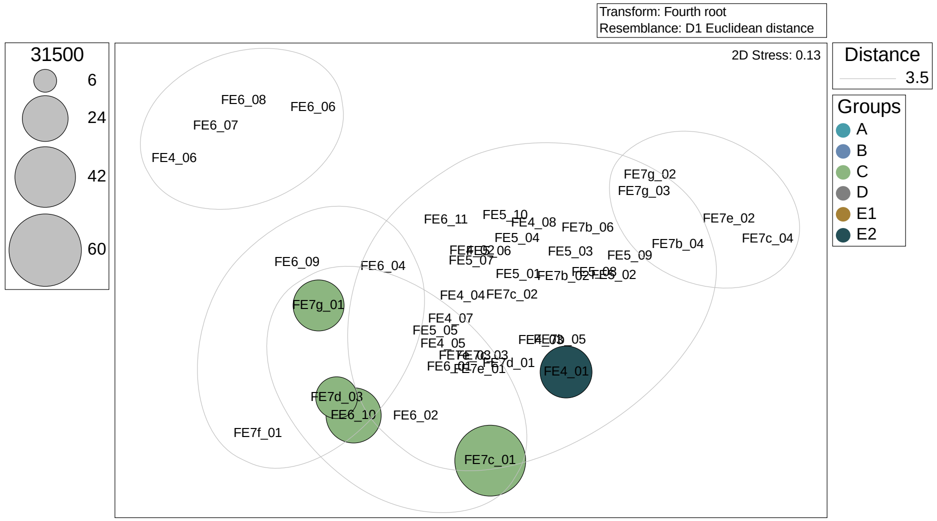
- Group A comprised four stations, including one from block FE4 and three from block FE6 and had an average Euclidean distance of 3.10. Group A was characterised by poorly sorted 'gravelly sand' (Folk BGS modified), with a median sediment particle size ranging from 669 µm to 1289 µm, mean of 929 µm (coarse sand), in water depth of 17 m to 22 m, mean of 19.8 m (BSL);
- Group B comprised four stations from block FE7 along the nearshore section of the ECR and had the lowest average Euclidean distance of 2.06. Group B was characterised by very poorly sorted 'muddy sand' (Folk BGS modified), with a median sediment particle size ranging from 50 µm to 194 µm, mean of 123 µm (fine sand), in water depth of 11 m to 16 m, mean of 12.5 m (BSL);
- Group C comprised four stations, including one from block FE6 and three from block FE7 and had an average Euclidean distance of 3.40. Group C was characterised by very poorly sorted 'sandy gravel', with a median sediment particle size ranging from 9279 µm to 33 003 µm, mean of 20 567 µm (coarse pebble), in water depth of 9 m to 21 m, mean of 12.4 (BSL);
- Group D comprised three stations, including two from block FE6 and one from block FE7 and had the highest average Euclidean distance of 4.46. Group D was characterised by very poorly sorted 'sandy gravel', with median sediment particle size ranging from 587 µm to 8094 µm, mean of 4529 µm (fine pebble), in water depth of 10 m to 20 m, mean of 15.7 m (BSL);
- Group E1 comprised 12 stations, including four from block FE4, one from block FE5, two from block FE6 and five from block FE7. Group E1 had an average Euclidean distance of 2.95 and was characterised by very poorly sorted 'muddy sandy gravel', with median sediment particle size ranging from 534 µm to 22 397 µm, mean of 7280 µm (fine pebble), in water depth of 9 m to 40 m, mean of 18.6 m (BSL);
- Group E2 comprised 17 stations, including three from block FE4, nine from block FE5, one from block FE6 and four from block FE7. Group E1 had an average Euclidean distance of 3.31 and was characterised by extremely poorly sorted mixed sediments, with median sediment particle size ranging from 10 µm to 4766 µm, mean of 854 µm (coarse sand), in water depth of 8 m to 40 m, mean of 25.4 m (BSL).

The sediment particle size primarily responsible for the separation of the multivariate groups included, the 16 000 µm, the 22 400 µm and the 31 500 µm within the coarse pebble region, the 11 200 µm (medium pebble) and the 63 µm and the 44.2 µm, within the coarse silt region (Figure 4.11).

Table 4.8: Summary of physical characteristics of sediment groups identified through the cluster analysis, Five Estuaries Offshore Site Investigation

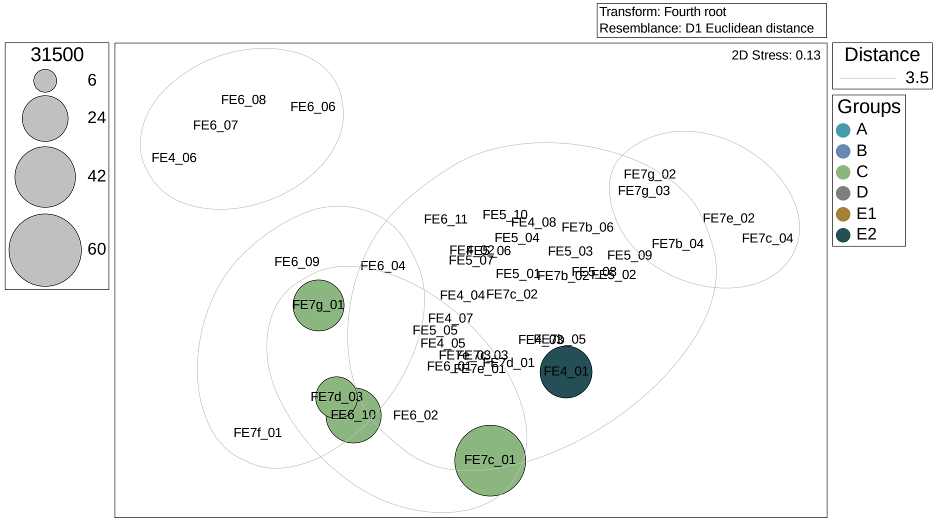
Multivariate Group	Station	Depth [m BSL]	Median Particle Size [µm]	Fractional Composition [%]			Sorting	
				Gravel	Sand	Fines	[µm]	Description
A ▲ Average distance^2: 3.10	FE4_06, FE6_06, FE6_07, FE6_08	19.8	929	18.94	80.92	0.14	2.19	Poorly sorted
B ▼ Average distance^2: 2.06	FE7c_04, FE7e_02, FE7g_02, FE7g_03	12.5	123	0.19	57.30	42.51	5.23	Very poorly sorted
C ■ Average distance^2: 3.40	FE6_10, FE7c_01, FE7d_03, FE7g_01	12.4	20567	72.19	25.12	2.69	7.26	Very poorly sorted
D ◆ Average distance^2: 4.46	FE6_04, FE6_09, FE7f_01	15.7	4529	51.29	47.54	1.17	5.91	Very poorly sorted
E1 * Average distance^2: 2.95	FE4_03, FE4_04, FE4_05, FE4_07, FE5_05,FE6_01, FE6_02, FE7b_05, FE7c_03, FE7d_01, FE7e_01, FE7e_03	18.6	7280	55.85	29.93	14.22	15.77	Very poorly sorted
E2 ● Average distance^2: 3.31	FE4_01, FE4_02, FE4_08, FE5_01, FE5_02, FE5_03, FE5_04, FE5_06, FE5_07, FE5_08, FE5_09, FE5_10, FE6_11, FE7b_02, FE7b_04, FE7b_06, FE7c_02	25.4	854	26.47	36.90	36.64	17.98	Extremely poorly sorted

Notes
Data refer to mean values in each multivariate group; values are fourth root transformed
BSL = Below Sea Level



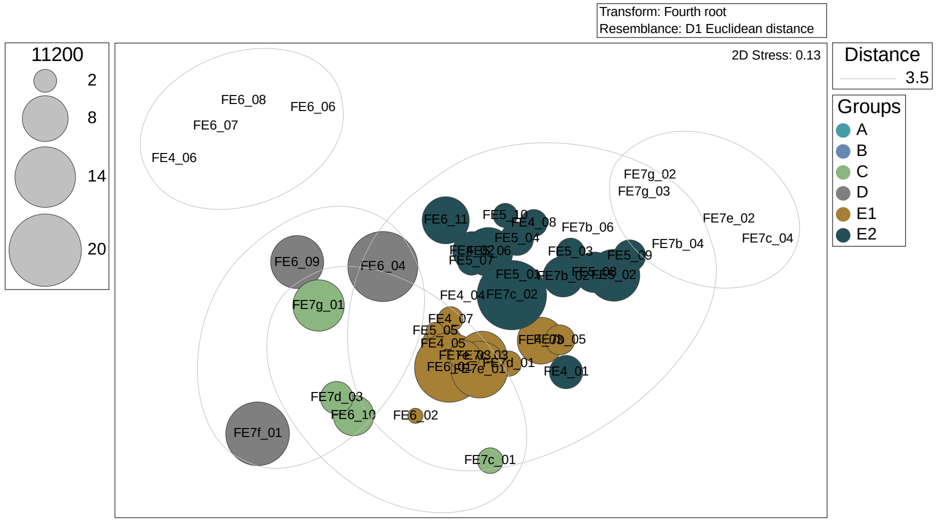
Notes

Circles proportional in diameter to the 31 500 µm sediment particle size (coarse pebble)



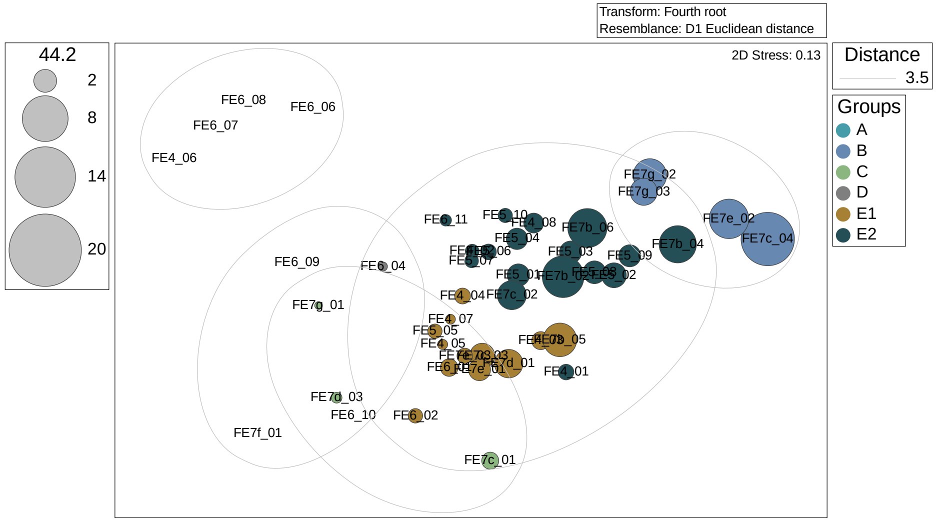
Notes

Circles proportional in diameter to the 22 400 µm sediment particle size (coarse pebble)



Notes

Circles proportional in diameter to the 11 200 µm sediment particle size (medium pebble)



Notes

Circles proportional in diameter to the 44.2 µm sediment particle size (coarse silt)

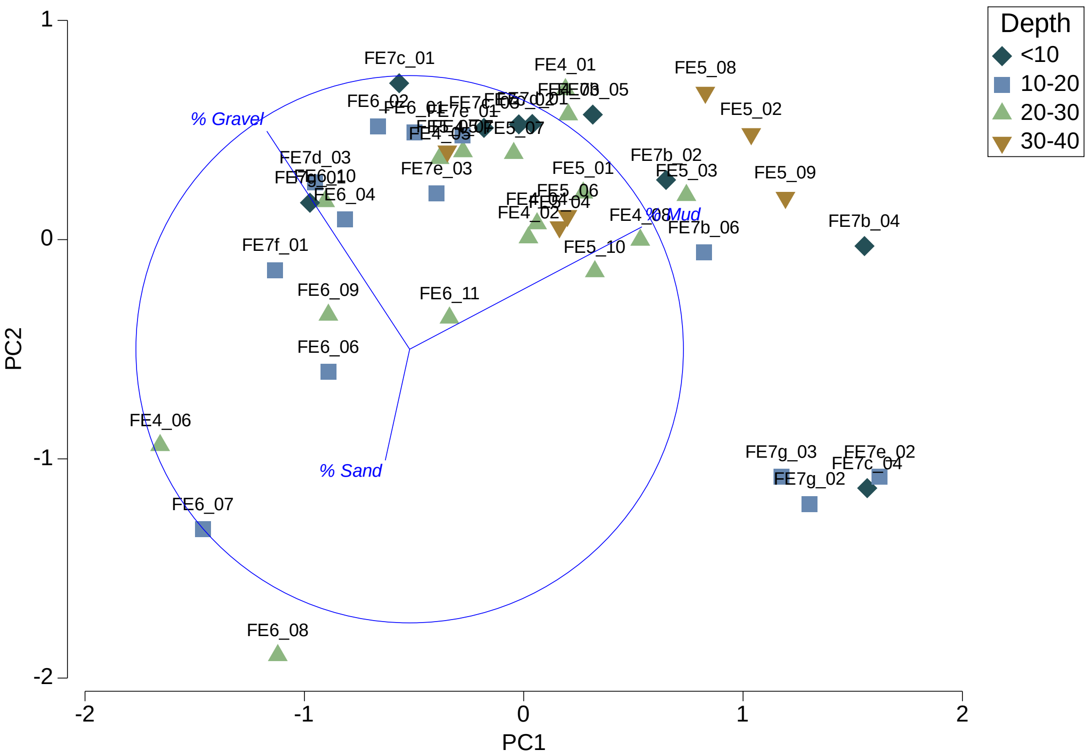
Figure 4.11: nMDS ordination of hierarchical clustering analysis of PSD with superimposed circles proportional in diameter to percentage of particles driving the separation of groups Five Estuaries Offshore Site Investigation

4.2.3.1 Principal Components Analysis

The principal component analysis (PCA) was used to reduce the sediment PSD across all samples into a smaller number of key variables (gravel, sand and mud). This highlighted the importance of the less represented sediment fractions in accounting for grain size variations, which are critical factors in determining the associated biological communities. The PCA also allowed visual representation of the association between sediment type and biological variables. Data were fourth root transformed. All data were in percentage therefore normalisation was not necessary.

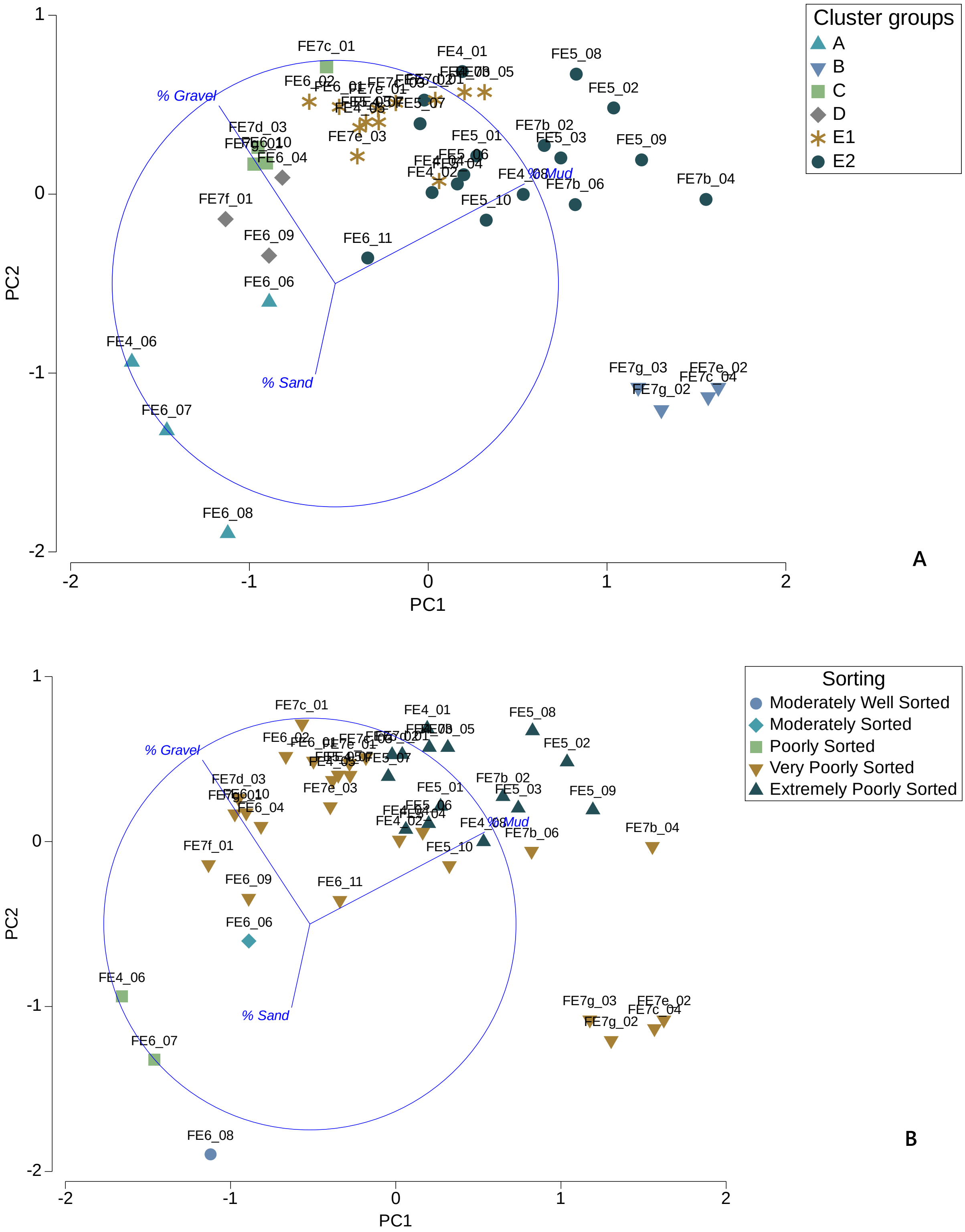
Results of the PCA indicated that the first two principal components accounted for 96.8 % of the variation, with the percentage of mud explaining most of the variation (62.2 %) along principal component one and the percentage of gravel explaining most of the variation (34.6 %) along principal component two. Sand explained 3.2 % of the variation along principal component three.

Figure 4.12 presents the results of the PCA with, superimposed, the depth range, highlighting the little influence of depth on the sediment distribution along the ECR. Figure 4.13 presents the results of the PCA with superimposed the groups identified through the cluster analysis (Section 4.2.3) and sediment sorting, highlighting the transition from moderately well sorted to extremely poorly sediment sorting, with increasing sediment heterogeneity.



Notes
PC = Principal component
BSL = Below sea level

Figure 4.12: 2D PCA of sediment composition with superimposed depth range (m BSL) ,Five Estuaries Offshore Site Investigation



Notes

PC = Principal component

Figure 4.13: 2D PCA of sediment composition with superimposed (A) groups identified through the cluster analysis, and (B) sorting coefficient, Five Estuaries Offshore Site Investigation

4.3 Sediment Chemistry

Results of the sediment chemistry analysis were assessed in terms of descriptive statistics, including the relative standard deviation (RSD) to indicate the extent of variability in the dataset. The RSD is defined as the ratio of the standard deviation to the mean and is expressed as a percentage. For this report, RSD of less than 30 % were considered low variability, 30 % to 70 % were considered moderate variability and more than 70 % were considered high variability.

Appendix E presents the analysis certificates.

4.3.1 Total Hydrocarbon Content

Table 4.9 presents the concentrations of total hydrocarbons reported from the surface sediment across the intertidal survey area and along the ECR.

4.3.1.1 Intertidal

In the intertidal area, THC content was below the limit of detection (LOD) (1 mg/kg) at mid water (station I_TR05_MW), compared to 1.26 mg/kg at high water (station I_TR05_HW) and 3.16 mg/kg at low water (station I_TR05_LW), all values being below the Cefas AL1 (100 mg/kg).

4.3.1.2 Export Cable Route

Along the ECR, THC content was below the LOD (1 mg/kg) at stations FE4_02_50 m, FE4_05 and FE5_09, along the offshore section of the ECR. At the remaining stations, all along the nearshore section of the ECR, THC content ranged from 8.24 mg/kg (station FE7b_04) to 10.3 mg/kg (FE7c_04), all values being below the Cefas AL1 (100 mg/kg).

Table 4.9: Summary of sediment hydrocarbon analysis, Five Estuaries Offshore Site Investigation

Station	THC
Intertidal	
I_TR05_HW	1.26
I_TR05_MW	< 1
I_TR05_LW	3.16
Mean	**1.64**
Standard deviation	**1.37**
RSD [%]	**84**
Export Cable Route	
Block FE4	
FE4_02_50 m	< 1
FE4_05	< 1
Block FE5	
FE5_09	< 1

Station	THC
Block FE7	
FE7b_02	9.56
FE7b_04	8.24
FE7c_04	10.3
FE7e_02	8.76
FE7g_03	9.78
Minimum	**< 1**
Maximum	**10.3**
Median	**8.50**
Mean	**6.02**
Standard deviation	**4.61**
RSD	**77**
Cefas Guideline Action Levels	
AL1	**100**
Notes Concentrations expressed in mg/kg Values below the limit of detection (LOD) have been treated as equal to ½ the value of LOD to derive the summary statistics Cefas = Centre for Environment Fisheries & Aquaculture Science THC = Total hydrocarbon content	

4.3.2 Sediment Polycyclic Aromatic Hydrocarbons (PAHs)

The total PAH concentrations were calculated as the sum of individual PAH concentrations. Some of the individual PAH concentrations were less than the LOD, as such unlikely to significantly influence the total 2 to 6 ring PAH concentrations. For this report, PAH concentrations less than LOD have been treated as being equal to their respective LODs. Consequently, the total PAH concentrations where one or more analytes were < LOD resulted in a less than value. Table 4.10 presents the results of the polycyclic aromatic hydrocarbons (PAHs) and the marine SQGs (details in Section 1.5).

4.3.2.1 Intertidal

In the intertidal area, concentrations of total PAHs ranged from < 38.3 µg/kg (I_TR05_LW), to < 91.3 µg/kg (I_TR05_HW). Samples from station I_TR05_MW had concentration of total PAHs of < 54.1 µg/kg. All concentrations of individual PAHs were below their respective SQGs.

4.3.2.2 Export Cable Route

Along the ECR, concentrations of total PAHs ranged from < 25.8 µg/kg at station FE4_02_50 m, along the offshore section of the ECR, to 911.7 µg/kg at station FE7b_02, along the nearshore section of the ECR. In general, concentrations of total PAHs were higher at stations along the nearshore section of the ECR, however, all concentrations of individual PAHs were below their respective SQGs.

Table 4.10: Summary of sediment polycyclic aromatic hydrocarbon analysis, Five Estuaries Offshore Site Investigation

Analyte	Station											CEMP (OSPAR, 2014)	NOAA (Long et al., 1995)	Canadian SQGs (CCME, 2022)	
	Intertidal			Export Cable Route											
	I_TR05_HW	I_TR05_MW	I_TR05_LW	Block FE4		Block FE5	Block FE7					ERL	ERM	TEL	PEL
				FE4_02_50 m	FE4_05	FE5_09	FE7b_02	FE7b_04	FE7c_04	FE7e_02	FE7g_03				
Acenaphthene	< 1	< 1	< 1	< 1	< 1	< 1	5.27	1.73	2.80	2.95	2.04	-	500	6.71	88.9
Acenaphthylene	< 1	< 1	< 1	< 1	< 1	< 1	4.48	1.97	4.19	5.24	1.87	-	640	5.87	128
Anthracene	1.27	< 1	< 1	< 1	< 1	< 1	10.1	5.06	8.23	8.90	5.17	85	1100	46.9	245
Benzo[a]anthracene	5.60	2.97	1.67	< 1	< 1	1.11	24.9	9.32	17.9	23.6	11.9	261	1600	74.8	693
Benzo[a]pyrene	6.29	3.63	2.86	< 1	1.28	< 1	32.1	10.5	16.7	28.3	12.5	430	1600	88.8	763
Benzo[b]fluoranthene	5.88	3.11	2.74	< 1	1.59	1.78	33.2	15.3	25.7	33.9	18.0	-	-	-	-
Benzo[e]pyrene	5.10	3.08	2.64	1.23	1.82	1.98	46.5	18.9	29.1	32.4	19.5	-	-	-	-
Benzo[ghi]perylene	4.40	2.49	2.25	1.31	1.69	< 1	33.7	14.6	21.2	31.6	15.5	85	-	-	-
Benzo[k]fluoranthene	3.85	2.48	1.81	< 1	1.14	1.38	28.1	8.00	18.7	18.8	13.5	-	-	-	-
C1-naphthalenes	< 1	< 1	< 1	2.05	2.83	5.93	129	44.9	81.3	53.3	53.9	155	-	-	-
C1-phenanthrene	2.14	1.53	< 1	1.47	1.78	4.17	72.1	27.2	44.9	41.9	33.0	170	-	-	-
C2-naphthalenes	1.50	< 1	1.49	2.11	3.03	7.36	101	37.7	61.8	46.0	44.7	150	-	-	-
C3-naphthalenes	< 1	< 1	< 1	1.41	1.94	4.22	79.9	28.8	48.8	47.4	36.4	-	-	-	-
Chrysene	5.90	3.63	2.61	< 1	1.17	1.46	33.6	16.5	28.0	27.4	18.5	384	2800	108	846
Dibenzo[ah]anthracene	< 1	< 1	< 1	< 1	< 1	< 1	3.40	1.50	2.78	3.56	1.50	-	260	6.22	135
Fluoranthene	16.1	7.91	3.61	1.49	2.11	4.38	59.6	24.9	39.7	52.7	28.7	600	5100	113	1494
Fluorene	< 1	< 1	< 1	< 1	< 1	< 1	9.16	3.59	5.93	6.35	3.85	-	540	21.2	144
Indeno[1,2,3-cd]pyrene	4.47	2.35	2.13	< 1	1.53	< 1	25.4	8.31	14.9	24.8	10.2	240	-	-	-
Naphthalene	< 1	< 1	< 1	1.07	1.31	2.31	42.8	14.7	30.5	19.3	20.1	160	2100	34.6	391
Perylene	1.72	1.22	< 1	< 1	< 1	< 1	17.9	9.25	12.9	13.8	9.33	-	-	-	-
Phenanthrene	6.84	4.14	1.21	1.18	1.52	3.81	64.9	22.2	39.2	45.7	27.2	240	1500	86.7	544
Pyrene	13.2	6.59	3.27	1.46	1.95	4.61	54.6	26.1	38.4	45.2	27.9	665	2600	153	1398
Total	**< 91.3**	**< 54.1**	**< 38.3**	**< 25.8**	**< 33.1**	**< 53.5**	**912**	**351**	**594**	**613**	**415**	-	-	-	-

Notes
Concentrations expressed in µg/kg dry sediment
CCME = Canadian Council of Ministers of the Environment
CEMP = Coordinated Environmental Monitoring Programme
ERL = Effects range low
ERM = Effects range median
NOAA = National Oceanic and Atmospheric Administration
OSPAR = Oslo and Paris Commission
PEL = Probable effects level
SQG = Sediment quality guidelines
TEL = Threshold effects level

4.3.3 Sediment Metals

Table 4.11 summarises the concentrations of the extractable metals in the sediment samples.

4.3.3.1 Intertidal

In the intertidal area, concentrations of all metals were below their respective SQGs.

The highest variability of metal concentrations was recorded for mercury, which had RSD of 81 % and concentrations ranging from < 0.01 mg/kg to 0.04 mg/kg with a mean of 0.02 mg/kg.

The lowest variability of metal concentration was recorded for copper, which had RSD of 7 % and concentrations ranging from 5.8 mg/kg to 6.7 mg/kg with a mean 6.2 mg/kg.

The remaining metals analysed had low to high variability with RSD values ranging from 16 % (aluminium and zinc) to 81 % (mercury).

4.3.3.2 Export Cable Route

Along the ECR, arsenic and nickel concentrations were above their respective Cefas AL1 (20 mg/kg) at three stations along the offshore section of the ECR (stations FE4_02_50 m, FE4_05 and FE5_09) and station FE7b_04 along the nearshore section of the ECR.

At station FE4_02_50 m, the arsenic concentration was 73.3 mg/kg, above the Canadian PEL (41.6 mg/kg) and the CEMP ERM (70 mg/kg). At station FE5_09, the arsenic concentration was 46.1 mg/kg, above the Canadian PEL. Concentrations of arsenic were above the Canadian TEL (7.24 mg/kg) at all stations along the ECR.

At stations FE4_02_50 m, FE5_09 and FE7b_04, nickel concentrations, with values of 58.2 mg/kg, 55.9 mg/kg and 56.0 mg/kg, respectively, were above the CEMP ERM (51.6 mg/kg).

Copper concentrations at stations FE5_09 and FE7b_04 were 31.3 mg/kg and 21.5 mg/kg, respectively, both values being above the Canadian TEL (18.7 mg/kg).

The cadmium concentration at station FE4_05 was 0.50 mg/kg, above the Cefas AL1 (0.4 mg/kg), whereas the chromium concentration at station FE5_09 was 42.9 mg/kg, above the Cefas AL1 (40 mg/kg).

The highest variability of metal concentrations was recorded for arsenic and nickel, which had RSDs of 73 %. Arsenic concentrations ranged from 9.7 mg/kg to 73.3 mg/kg, with a mean of 30.9 mg/kg, and nickel concentrations ranged from 9.4 mg/kg to 58.2 mg/kg, with a mean of 30.2 mg/kg. The lowest variability of metal concentrations was recorded for lead, which had an RSD of 30 % and concentrations ranging from 6.3 mg/kg to 17.3 mg/kg with a mean of 12.9 mg/kg.

The remaining metals analysed had moderate variability with RSDs ranging from 32 % (barium) to 62 % (cadmium).

Table 4.11: Summary of sediment metals analysis, Five Estuaries Offshore Site Investigation

Station	Al	As	Ba	Cd	Cr	Cu	Hg	Ni	Pb	Sn	Zn
Intertidal											
I_TR05_HW	834	4.0	19.1	< 0.04	2.9	5.8	< 0.01	3.8	3.4	< 0.5	16.2
I_TR05_MW	757	6.2	68.3	0.08	5.4	6.7	0.04	6.4	3.6	< 0.5	13.1
I_TR05_LW	606	5.4	55.3	< 0.04	3.1	6.1	0.02	4.2	6.7	< 0.5	12.0
Mean	**732**	**5.2**	**47.6**	**-**	**3.8**	**6.2**	**0.02**	**4.8**	**4.6**	**< 0.5**	**13.8**
Standard deviation	**116**	**1.11**	**25.5**	**-**	**1.39**	**0.46**	**0.018**	**1.40**	**1.85**	**-**	**2.18**
RSD	**16**	**21**	**54**	**-**	**37**	**7**	**81**	**29**	**41**	**-**	**16**
Export Cable Route											
Block FE4											
FE4_02_50 m	14800	73.3	59.6	0.28	23.2	11.4	0.03	58.2	8.8	0.5	43.8
FE4_05	9690	40.0	107	0.50	16.5	6.7	0.02	20.9	6.3	< 0.5	28.2
Block FE5											
FE5_09	21100	46.1	101	0.28	42.9	31.3	0.05	55.9	15.6	1.0	85.6
Block FE7											
FE7b_02	8930	14.2	62.3	0.14	19.9	15.1	0.07	16.0	17.3	1.1	53.4
FE7b_04	10500	39.3	55.9	0.31	20.7	21.5	0.10	56.0	17.1	1.0	62.3
FE7c_04	5850	10.7	53.9	0.09	13.9	9.6	0.05	11.3	12.7	0.8	37.6
FE7e_02	8160	13.9	62.5	0.13	20.1	13.0	0.04	14.2	13.3	0.7	55.7
FE7g_03	4200	9.7	48.8	0.10	12.1	9.5	0.04	9.4	12.3	0.7	38.1
Minimum	**4200**	**9.7**	**48.8**	**0.09**	**12.1**	**6.7**	**0.02**	**9.4**	**6.3**	**< 0.5**	**28.2**
Maximum	**21100**	**73.3**	**107**	**0.50**	**42.9**	**31.3**	**0.10**	**58.2**	**17.3**	**1.1**	**85.6**
Median	**9310**	**26.8**	**61.0**	**0.21**	**20**	**12.2**	**0.05**	**18.5**	**13.0**	**0.75**	**48.6**
Mean	**10400**	**30.9**	**68.9**	**0.23**	**21.2**	**14.8**	**0.05**	**30.2**	**12.9**	**0.76**	**50.6**
Standard deviation	**5350**	**22.7**	**22.2**	**0.141**	**9.53**	**8.04**	**0.025**	**22.2**	**3.88**	**0.28**	**18.0**
RSD	**51**	**73**	**32**	**62**	**45**	**54**	**50**	**73**	**30**	**38**	**36**
Cefas Guideline Action Levels											
AL1	**-**	**20**	**-**	**0.4**	**40**	**40**	**0.3**	**20**	**50**	**-**	**130**
AL2	**-**	**100**	**-**	**5**	**400**	**400**	**3**	**200**	**500**	**-**	**800**
CEMP Assessment Criteria (OSPAR, 2014)											

Station	Al	As	Ba	Cd	Cr	Cu	Hg	Ni	Pb	Sn	Zn
ERL	-	-	-	1.20	81.0	34.0	0.150	-	47.0	-	150
National Oceanic and Atmospheric Administration (NOAA) Effects Ranges (Long et al., 1995)											
ERM	-	70	-	9.6	370	270	0.71	51.6	218	-	410
Canadian Sediment Quality Guidelines (CCME, 2022)											
TEL	-	7.24	-	0.7	52.3	18.7	0.13	-	30.2	-	124
PEL	-	41.6	-	4.2	160	108	0.7	-	112	-	271

Notes
Concentrations expressed in mg/kg dry sediment
For datasets with values below the limit of detection (LOD) these have been treated as equal to ½ the value of LOD to derive the summary statistics
Cefas action levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans
Al = Aluminium As = Arsenic Ba = Barium Cd = Cadmium Cr = Chromium Cu = Copper
Hg = Mercury Ni = Nickel Pb = Lead Sn = Tin Zn = Zinc
AL1 = Action level 1
AL2 = Action level 2
Cefas = Centre for Environment, Fisheries and Aquaculture Science
CEMP = Coordinated Environmental Monitoring Programme
ERL = Effects range low
ERM = Effects range median
OSPAR = Oslo and Paris Commission
PEL = Probable effects level
TEL = Threshold effects level

Key	Below Cefas AL1	Above Cefas AL1	Above Cefas AL2

4.3.4 Sediment Polychlorinated Biphenyls

The total polychlorinated biphenyl (PCB) concentrations were calculated as the sum of individual PCB concentrations. Some of the individual PCB concentrations were less than the LOD, as such unlikely to significantly influence the total PCB concentrations. For this report, PCB concentrations less than LOD have been treated as being equal to their respective LODs. Consequently, the total PCB concentrations where one or more analytes were < LOD, resulted in a less than value.

Table 4.12 summarises the concentrations of PCBs in the sediment sample from the intertidal and the ECR survey area.

4.3.4.1 Intertidal

The concentrations of all individual PCB congeners analysed were below the LOD (< 0.00008 mg/kg), and the sum of the 25 congeners was below the Cefas AL1 (0.02 mg/kg) and AL2 (0.2 mg/kg).

4.3.4.2 Export Cable Route

The concentrations of all individual PCB congeners analysed were below the LOD (< 0.00008 mg/kg) at station FE5_09, in the central section of the ECR, stations FE4_02_50 and FE4_05 along the offshore section of the ECR and station FE7g_03 along the nearshore section of the ECR.

At the remaining stations, all along the nearshore section of the ECR, the concentration of selected PCB congeners was above the LOD, which resulted in the sum of the 25 congeners being between < 0.00200 mg/kg and < 0.00244 mg/kg, all values being below the Cefas AL1 (0.02 mg/kg) and AL2 (0.2 mg/kg).

Table 4.12: Summary of polychlorinated biphenyls (PCBs) analysis, Five Estuaries Offshore Site Investigation

Analyte	Station											Cefas Guideline Action Levels	
	Intertidal			Export Cable Route									
	I_TR05_HW	I_TR05_MW	I_TR05_LW	Block FE4		Block FE5	Block FE7					AL1	AL2
				FE4_02_50 m	FE4_05	FE5_09	FE7b_02	FE7b_04	FE7c_04	FE7e_02	FE7g_03		
PCB 101	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00012	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 105	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 110	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00016	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 118	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00016	< 0.00008	0.00009	< 0.00008	< 0.00008	-	-
PCB 128	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 138	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00012	0.00008	< 0.00008	0.00012	< 0.00008	-	-
PCB 141	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 149	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00011	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 151	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 153	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00022	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 156	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 158	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 170	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 18	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 180	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 183	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 187	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 194	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 28	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00009	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 31	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 44	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 47	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 49	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 52	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
PCB 66	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00010	< 0.00008	< 0.00008	< 0.00008	< 0.00008	-	-
Total	< 0.00200	< 0.00200	<0.00200	< 0.00200	< 0.00200	< 0.00200	< 0.00244	< 0.00200	< 0.00201	< 0.00204	< 0.00200	0.02	0.2

Notes
Concentrations expressed as mg/kg dry weight
Cefas = Centre for Environment Fisheries & Aquaculture Science
AL1 = Action Level 1
AL2 = Action Level 2
Cefas action levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans

4.3.5 Sediment Organotins

Table 4.13 summarises the concentrations of organotins in the sediment samples.

The organotins analysed included dibutyltin (DBT) and tributyltin (TBT), the concentrations of which were below their respective LOD and below the Cefas AL1 (0.1 mg/kg) and AL2 (1 mg/kg) at all stations across the intertidal survey area and along the ECR.

Table 4.13: Summary of organotins analysis, Five Estuaries Offshore Site Investigation

Station	Dibutyltin (DBT)	Tributyltin (TBT)
Intertidal		
T_TR05_HW	< 0.001	< 0.001
T_TR05_MW	< 0.001	< 0.001
T_TR05_LW	< 0.001	< 0.001
Export Cable Route		
Block FE4		
FE4_02_50 m	< 0.001	< 0.001
FE4_05	< 0.001	< 0.001
Block FE5		
FE5_09	< 0.005	< 0.005
Block FE7		
FE7b_02	< 0.005	< 0.005
FE7b_04	< 0.005	< 0.005
FE7c_04	< 0.005	< 0.005
FE7e_02	< 0.001	< 0.001
FE7g_03	< 0.005	< 0.005
Cefas Guideline Action Levels		
AL1	**0.1**	**0.1**
AL2	**1**	**1**

Notes
Concentrations expressed as mg/kg dry weight
Cefas = Centre for Environment Fisheries & Aquaculture Science
AL1 = Action Level 1
AL2 = Action Level 2
Cefas action levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans

4.3.6 Sediment Organochlorine Pesticides

Table 4.14 presents a summary of the OCPs in the sediment samples.

Currently, Cefas AL1 values are established for dieldrin (0.005 mg/kg) and dichlorodiphenyltrichloroethane (DDT) (0.001 mg/kg). P,p'-dichlorodiphenyltrichloroethane (PPDDT) is the main isomeric form DDT and hence can be compared to the Cefas AL1 value for DDT (0.001 mg/kg).

The concentration of all OCPs analysed were below the LOD (0.0001 mg/kg) across the intertidal survey area.

Along the ECR most values of OCPs were < LOD. Station FE7b_02 had a dieldrin concentration of 0.0001 mg/kg, below the Cefas AL1 (0.005 mg/kg). The dichlorodiphenyldichloroethane (PPTDE) concentration was 0.0002 mg/kg at stations FE7b_02 and FE7c_04, whereas p,p'-dichlorodiphenyldichloroethylene (PPDDE) was 0.0003 mg/kg at station FE7b_02 and 0.0001 mg/kg at stations FE7b_04 and FE7c_04. Concentrations of PPDDT were below the LOD and Cefas AL1.

Table 4.14: Summary of organochlorine pesticides (OCP) analysis, Five Estuaries Offshore Site Investigation

Analyte	Station											Cefas Guideline Action Levels	
	Intertidal			Export Cable Route									
	I_TR05_HW	I_TR05_MW	I_TR05_LW	Block FE4		Block FE5	Block FE7						
				FE4_02_50 m	FE4_05	FE5_09	FE7b_02	FE7b_04	FE7c_04	FE7e_02	FE7g_03	AL1	AL2
AHCH	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	-
BHCH	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	-
GHCH	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	-
Dieldrin	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.005	-
HCB	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	-
PPTDE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	0.0002	< 0.0001	< 0.0001	-	-
PPDDE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0003	0.0001	0.0001	< 0.0001	< 0.0001	-	-
PPDDT	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.001	-

Notes
Concentrations expressed as mg/kg dry weight
Cefas = Centre for Environment Fisheries & Aquaculture Science
AL = Action level
AHCH = alpha-Hexachlorocyclohexane
BHCH = beta-Hexachlorocyclohexane
GHCH = gamma-Hexachlorocyclohexane
HCB = Hexachlorobenzene
PPTDE = p,p'-Dichlorodiphenyldichloroethane
PPDDE = p,p'-Dichlorodiphenyldichloroethylene
PPDDT = p,p'-Dichlorodiphenyltrichloroethane
Cefas action levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans

4.4 Sediment Macrofauna

4.4.1 Intertidal Core Samples

4.4.1.1 Phyletic Composition and Characteristic Taxa

Following rationalisation, the macrofaunal dataset from the core samples comprised 19 taxa and 390 individuals. The excluded taxa comprised juveniles and damaged taxa. Juveniles comprised arthropods of the genera *Urothoe*, *Bathyporeia* and *Eurydice*. A single juvenile mollusc of the genus *Cerastoderma* was recorded at mid water along transect I_TR02.

Table 4.15 summarises the phyletic composition of the macrofauna across the intertidal survey area and Table 4.16 presents the top ten most frequently occurring taxa. Figure 4.14 presents the phyletic composition of taxa and individuals at each core sample station.

Table 4.15: Taxonomic groups of intertidal macrofauna (0.01 m^2), Five Estuaries Offshore Site Investigation

Taxonomic Group	Number of Taxa	Composition of Taxa [%]	Abundance	Composition of Individuals [%]
Annelida	9	47.4	200	51.3
Arthropoda	7	36.8	75	19.2
Other phyla	3	15.8	115	29.5
Total	**19**	**100**	**390**	**100**

Notes
Macrofaunal samples were processed through a 1 mm sieve
Other phyla were represented by Collembola, Nematoda and Platyhelminthes

Table 4.16: Top ten most frequently occurring intertidal taxa, Five Estuaries Offshore Site Investigation

Taxon	Abundance [0.01 m^2]	Frequency of occurrence [% core samples]
Nematoda	2.57	60.9
Platyhelminthes	2.39	52.2
Paraonis fulgens	0.83	30.4
Cumopsis goodsir	1.26	30.4
Psammodrilus balanoglossoides	0.52	26.1
Spio martinensis	1.26	21.7
Bathyporeia pelagica	0.74	21.7
Protodriloides chaetifer	1.30	13.0
Enchytraeidae	4.09	13.0
Eurydice naylori	0.13	13.0
Tanaissus lilljeborgi	0.96	13.0

Notes
Macrofauna sieved through a 0.5 mm mesh sieve
Taxa listed in decreasing order of frequency of abundance

Annelida comprised most of the taxa composition (47.4 %) followed by Arthropoda (36.8 %) and other phyla (15.8 %) (Table 4.15), the latter comprising Nematoda, Collembola and Platyhelminthes.

Annelida also comprised most of the abundance (51.3 %) followed by other taxa (29.5 %) and Arthropoda (19.2 %) (Table 4.15).

Annelida were represented by oligochaetes and polychaetes. Oligochaetes of the family Enchytraeidae were numerically dominant, along with the polychaete *Protodriloides chaetifer*, although they had restricted distributions. Conversely, the polychaetes *Paraonis fulgens*, *Spio martinensis* and *Psammodrilus balanoglossoides* were the most frequently occurring (Table 4.16). On site observations, detailed in Appendix C.1, recorded *Lanice conchilega* at core sampling stations I_TR05_LW and I_TR01_LW.

Amongst the Arthropoda, the cumacean *Cumopsis goodsir* and the amphipod *Bathyporeia pelagica* were the most frequently occurring. These arthropods were also the most abundant along with *Tanaissus lilljeborgi*, albeit the latter was less frequently occurring (Table 4.16).

Of the other phyla, Nematoda, with 59 individuals, and Platyhelminthes with 55 individuals, were the most abundant and frequently occurring invertebrates across the intertidal survey area (Table 4.16 and Figure 4.14).

The macrofauna from the upper shore core samples was poorly represented, with each core sample comprising one or two species (Figure 4.14), of which Enchytraeidae, were numerically dominant. Other invertebrates included the isopod *Eurydice naylori*, Nematoda and Platyhelminthes.

Of the core samples from the mid shore, sample I_TR03_MW_FA was devoid of fauna, whereas the remaining core samples had between two and five individuals (Figure 4.14), of which Nematoda were numerically dominant. Other invertebrates included polychaetes and arthropods.

The macrofauna from the low shore core samples was comparatively richer, the number of taxa per sample ranging from two to eight, with most core samples comprising invertebrates from all phyla recorded along the intertidal transects (Figure 4.14).

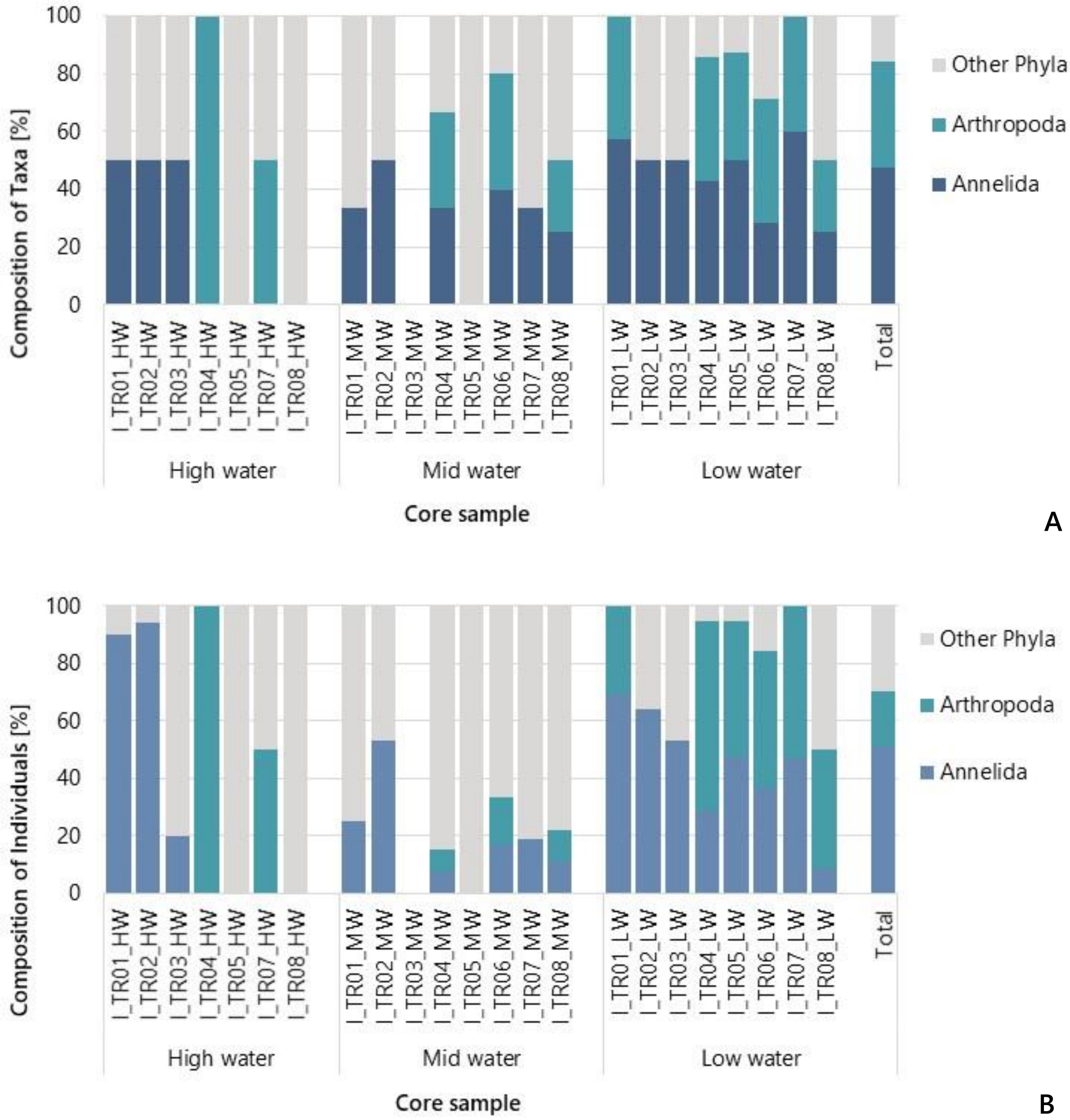


Figure 4.14: Phyletic composition of intertidal macrofaunal (A) taxa and (B) individuals, Five Estuaries Offshore Site Investigation

4.4.1.2 Community Statistics

Table 4.17 presents the results of the univariate analysis of the macrofauna from the core samples. Univariate indices included faunal richness (Margalef's index d), diversity (Shannon-Wiener Index H'Log$_2$), evenness (Pielou's index J') and dominance (Simpson's index λ). Sample at high water along transect I_ TR03 was abiotic whereas core sample at high water along transect I_TR04 had a single individual. The number of taxa and individual was on average higher at the low water stations, which resulted in higher values of richness, diversity and evenness.

The intertidal fauna was fairly evenly distributed across the taxa recorded, as indicated by the evenness values which ranged from 0.312 at station I_TR02_HW, to 1.000 at station I_TR07_HW, with a mean of 0.792. The high evenness at station I_TR07_HW was due to the presence of two taxa, each comprising a single individual. Conversely, the low evenness at station I_TR02_HW was associated with a numerical dominance of Enchytraeidae, which comprised 84 individuals. Values of evenness and dominance were inversely related so that low values of evenness generally corresponded to high values of dominance and vice versa.

Table 4.17: Intertidal macrofaunal community statistics (0.01 m^2), Five Estuaries Offshore Site Investigation

Station	Numbers		Richness	Diversity	Evenness	Dominance
	Taxa	Individuals	Margalef [d]	Shannon-Wiener [$H'Log_2$]	Pielou [J']	Simpson [λ]
High Water						
I_TR01_HW	2	10	0.43	0.47	0.469	0.820
I_TR02_HW	2	89	0.22	0.31	0.312	0.894
I_TR03_HW	2	5	0.62	0.72	0.722	0.680
I_TR04_HW	1	1	-	-	-	-
I_TR05_HW	2	8	0.48	0.54	0.544	0.781
I_TR07_HW	2	2	1.44	1.00	1.000	0.500
I_TR08_HW	2	5	0.62	0.72	0.722	0.680
Mid Water						
I_TR01_MW	3	4	1.44	1.50	0.946	0.375
I_TR02_MW	2	15	0.37	1.00	0.997	0.502
I_TR04_MW	3	13	0.78	0.77	0.488	0.728
I_TR05_MW	2	6	0.56	0.92	0.918	0.556
I_TR06_MW	5	12	1.61	1.58	0.683	0.472
I_TR07_MW	3	21	0.66	1.25	0.787	0.501
I_TR08_MW	4	9	1.37	1.75	0.876	0.333
Low Water						
I_TR01_LW	7	39	1.64	2.11	0.750	0.311
I_TR02_LW	2	14	0.38	0.94	0.940	0.541
I_TR03_LW	2	32	0.29	1.00	0.997	0.502
I_TR04_LW	7	38	1.65	2.43	0.864	0.240
I_TR05_LW	8	19	2.38	2.78	0.927	0.163
I_TR06_LW	7	19	2.04	2.58	0.921	0.186
I_TR07_LW	5	17	1.41	2.01	0.867	0.287
I_TR08_LW	4	12	1.21	1.78	0.892	0.319
Minimum	**1**	**1**	**0.22**	**0.31**	**0.312**	**0.163**
Maximum	**8**	**89**	**2.38**	**2.78**	**1.000**	**0.894**
Median	**3**	**13**	**0.78**	**1.00**	**0.867**	**0.501**
Mean	**4**	**18**	**1.03**	**1.34**	**0.792**	**0.494**
Standard Deviation	**2**	**19**	**0.63**	**0.73**	**0.195**	**0.212**

4.4.1.3 Biomass

Table 4.18 presents the percentage contribution of phyla to biomass along the intertidal transects and Table 4.19 presents the biomass of major taxonomic groups at each core station. It is worth noting that the biomass of Arthropoda comprises only invertebrates of the subphylum Crustacea; the biomass of arachnids of the subclass Acari is included in other phyla. Figure 4.15 presents the phyletic composition of the biomass at each station. Appendix F.2 presents the raw data. The raw data include juveniles and damaged fauna, which were removed from the analysis.

Arthropoda comprised 60.0 % of the intertidal macrofaunal biomass, followed by Annelida (34.7 %) and other phyla (5.2 %).

The total intertidal biomass increased from the high water to the low water, reflecting the higher macrofaunal richness and diversity at low water.

Table 4.18: Taxonomic groups of intertidal macrofaunal biomass, Five Estuaries Offshore Site Investigation

Phylum	Biomass [AFDW g/0.01 m^2]	Biomass [%]
Annelida	0.00423	34.7
Arthropoda	0.00731	60.0
Other phyla	0.00064	5.2
Total	**0.01218**	**100.0**
Notes Annelida comprised oligochaeta and polychaeta Other phyla included Acari, Collembola, Nematoda and Platyhelminthes Arthropoda biomass comprised only invertebrates of the subphylum Crustacea		

Table 4.19: Phyletic composition of intertidal macrofaunal biomass, Five Estuaries Offshore Site Investigation

Station	Biomass				
	Annelida		Arthropoda	Other phyla	Total
	Polychaeta	Oligochaeta			
I_TR01_HW	-	0.00008	-	0.00002	**0.00009**
I_TR02_HW	-	0.00028	-	0.00002	**0.00029**
I_TR03_HW	-	0.00002	-	0.00002	**0.00003**
I_TR04_HW	-	-	0.00083	-	**0.00083**
I_TR05_HW	-	-	-	0.00002	**0.00002**
I_TR07_HW	-	-	-	0.00002	**0.00002**
I_TR08_HW	-	-	-	0.00002	**0.00002**
Mid Water					
I_TR01_MW	0.00005	-	-	0.00002	**0.00006**
I_TR02_MW	0.00020	-	-	0.00002	**0.00022**
I_TR04_MW	0.00005	-	0.00002	0.00002	**0.00008**

Station	Biomass				
	Annelida		Arthropoda	Other phyla	Total
	Polychaeta	Oligochaeta			
I_TR05_MW	-	-	-	0.00002	**0.00002**
I_TR06_MW	0.00005	-	0.00092	0.00028	**0.00125**
I_TR07_MW	0.00002	-	-	0.00003	**0.00005**
I_TR08_MW	0.00006	-	0.00196	0.00002	**0.00204**
Low water					
I_TR01_LW	0.00078	-	0.00043	-	**0.00120**
I_TR02_LW	0.00003	-	-	0.00002	**0.00005**
I_TR03_LW	0.00012	-	0.00002	0.00008	**0.00022**
I_TR04_LW	0.00040	-	0.00119	0.00002	**0.00161**
I_TR05_LW	0.00164	-	0.00036	0.00002	**0.00202**
I_TR06_LW	0.00023	-	0.00081	0.00002	**0.00106**
I_TR07_LW	0.00022	-	0.00061	-	**0.00082**
I_TR08_LW	0.00002	-	0.00016	0.00002	**0.00019**
Minimum	**0.00002**	**0.00002**	**0.00002**	**0.00002**	**0.00002**
Maximum	**0.00164**	**0.00028**	**0.00196**	**0.00028**	**0.00204**
Median	**0.00009**	**0.00008**	**0.00061**	**0.00002**	**0.00020**
Mean	**0.00028**	**0.00012**	**0.00066**	**0.00003**	**0.00055**
Standard deviation	**0.00044**	**0.00014**	**0.00057**	**0.00006**	**0.00068**

Notes
Biomass expressed as ash free dry weight in g/0.01 m^2 grab sample
Arthropoda comprises only invertebrates of the subphylum Crustacea

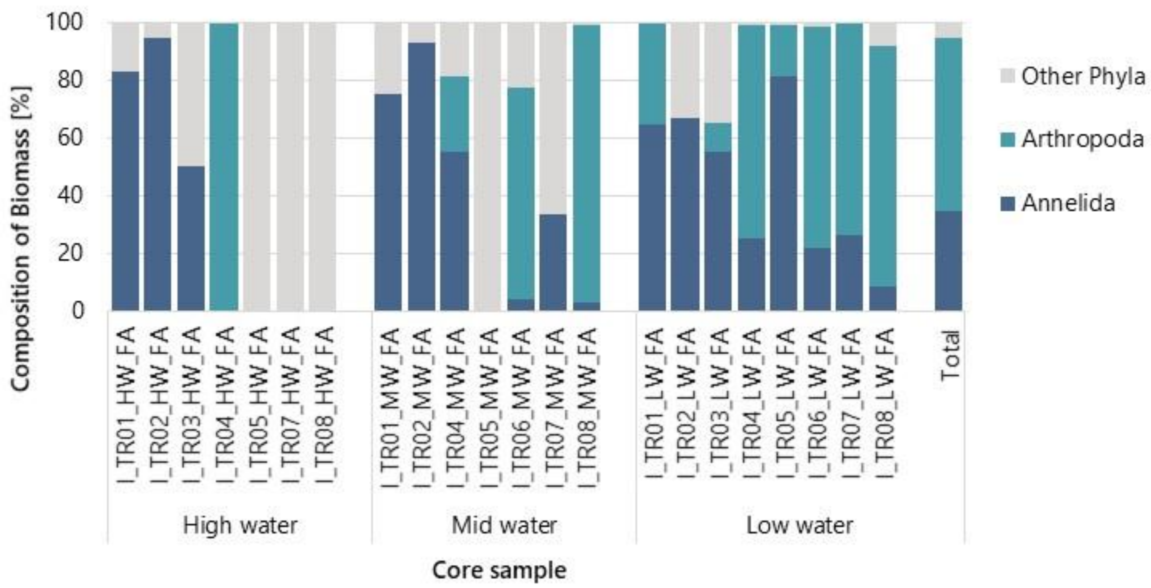


Figure 4.15: Phyletic composition of intertidal biomass, Five Estuaries Offshore Site Investigation

4.4.2 Export Cable Route Grab Samples

The macrofauna from the grab samples included infauna and epifauna, the latter comprising solitary and sessile organisms. The infauna and solitary epifauna were enumerated and were analysed together in terms of phyletic composition, species diversity, abundance and distribution. The sessile colonial epifauna, recorded as P, was removed from the enumerated dataset and assessed for taxa composition and distribution. Appendix F presents the full species list.

4.4.3 Infaunal and Solitary Epifauna

4.4.3.1 Phyletic Composition

Following rationalisation (details in Section 3.3.2), the enumerated macrofaunal dataset along the ECR comprised 262 taxa and 8402 individuals. The excluded taxa included juveniles, pelagic (Chaetognatha), parasitic (Bobyroidea) and damaged fauna. In addition, two species of *Leiochone*, one species of *Callipallene* and one species of *Ericthonius*, were aggregated to their respective genera, whereas *Leptocheirus hirsutimanus* was aggregated to family level (Aoridae).

Juveniles comprised 35 taxa and 1039 individuals, of which species of *Mytilus*, with 729 individuals and *Abra*, with 78 individuals, were numerically dominant.

Table 4.20 summarises the phyletic composition of the enumerated fauna along the ECR and Figure 4.18 presents the phyletic composition of taxa and individuals of the enumerated macrofauna.

Table 4.20: Taxonomic groups of enumerated fauna, export cable route, Five Estuaries Offshore Site Investigation

Taxonomic Group	Number of Taxa	Composition of Taxa [%]	Abundance	Composition of Individuals [%]
Annelida	129	49.2	2946	35.1
Arthropoda	65	24.8	2228	26.5
Mollusca	47	17.9	2115	25.2
Echinodermata	10	3.8	226	2.7
Other phyla	11	4.2	887	10.6
Total	**262**	**100**	**8402**	**100**

Notes
Macrofaunal samples were processed through a 1 mm sieve
Other phyla included: Chordata, Cnidaria, Entoprocta, Hemichordata, Nemertea, Phoronida, Platyhelminthes and Sipuncula

Annelida comprised most of the enumerated taxa composition (49.2 %), followed by Arthropoda (24.8 %), Mollusca (17.9 %) and Echinodermata (3.8 %). Other phyla comprised 4.2 % of the taxa composition (Table 4.20) and were represented by Cnidaria (*Cerianthus lloydii*, anemones of the family Edwardsiidae and non-burrowing anemones of the order Actiniaria), Sipuncula (*Golfingia elongata* and *Golfingia vulgaris*), Entoprocta (*Loxosoma annelidicola*), Enteropneusta, *Phoronis*, Ascidiacea, Nemertea and Platyhelminthes.

When assessed on a station basis, Annelida were recorded at all 44 stations sampled and comprised most of the taxa composition at all stations except station FE7Eg_02, along the nearshore section of the ECR (Figure 4.18). At stations in survey block FE6, Annelida had the highest mean percentage contribution to taxa and were the only phylum recorded at stations FE6_07 and FE6_09.

Arthropoda were recorded at 36 stations and had the highest mean percentage contribution to taxa at stations in survey block FE4, along the offshore section of the ECR. Station FE7f_01 had the highest percentage of Arthropoda (Figure 4.18) and analysis of the species list indicated that this station had two invertebrates represented by the amphipod *Bathyporeia pelagica* and the polychaete *Magelona johnstoni*.

Mollusca were recorded at 38 stations and had the highest mean percentage contribution to taxa at stations in survey block FE7, with molluscs having the highest percentage contribution to taxa at station FE7g_02 (Figure 4.18). Analysis of the species list indicated that station FE7g_02 comprised four invertebrates represented by the bivalves *Nucula nitidosa* and *Modiolula phaseolina*, the polychaete *Caulleriella alata* and the brittlestar *Amphipholis squamata*.

Echinodermata were recorded at 32 stations and had the highest mean percentage contribution to taxa at stations in survey block FE5. Other phyla were recorded at 35 stations and had similar percentage contribution to taxa at stations in survey blocks FE6 and FE7.

Mollusca comprised most of the enumerated macrofaunal abundance (35.1 %) followed by Arthropoda (26.5 %), Mollusca (25.2 %) and Echinodermata (2.7 %) whereas other phyla comprised 10.6 % of the enumerated macrofaunal abundance (Table 4.20).

When assessed on a station basis, Annelida comprised the highest mean abundance at stations in survey block FE6 and was associated with the number of taxa, as well as a numerical dominance of the polychaete *Lagis koreni* at station FE6_11.

Arthropoda comprised the highest mean abundance at stations in survey block FE4, particularly at stations FE4_04 and FE4_05, where it was associated with a numerical dominance of the crab *Pisidia longicornis*.

Mollusca comprised the highest mean abundance at stations in survey block FE7 and was associated with bivalves such as *Nucula nitidosa* and *Nucula nucleus*. The mean percentage contribution of Echinodermata to the enumerated macrofaunal abundance was similar in all survey blocks along the ECR, whereas that of other phyla was highest at stations in survey block FE7, particularly at stations FE7d_03 and F7Eg_01. Analysis of the species list indicated a numerical abundance of Ascidiacea at these stations.

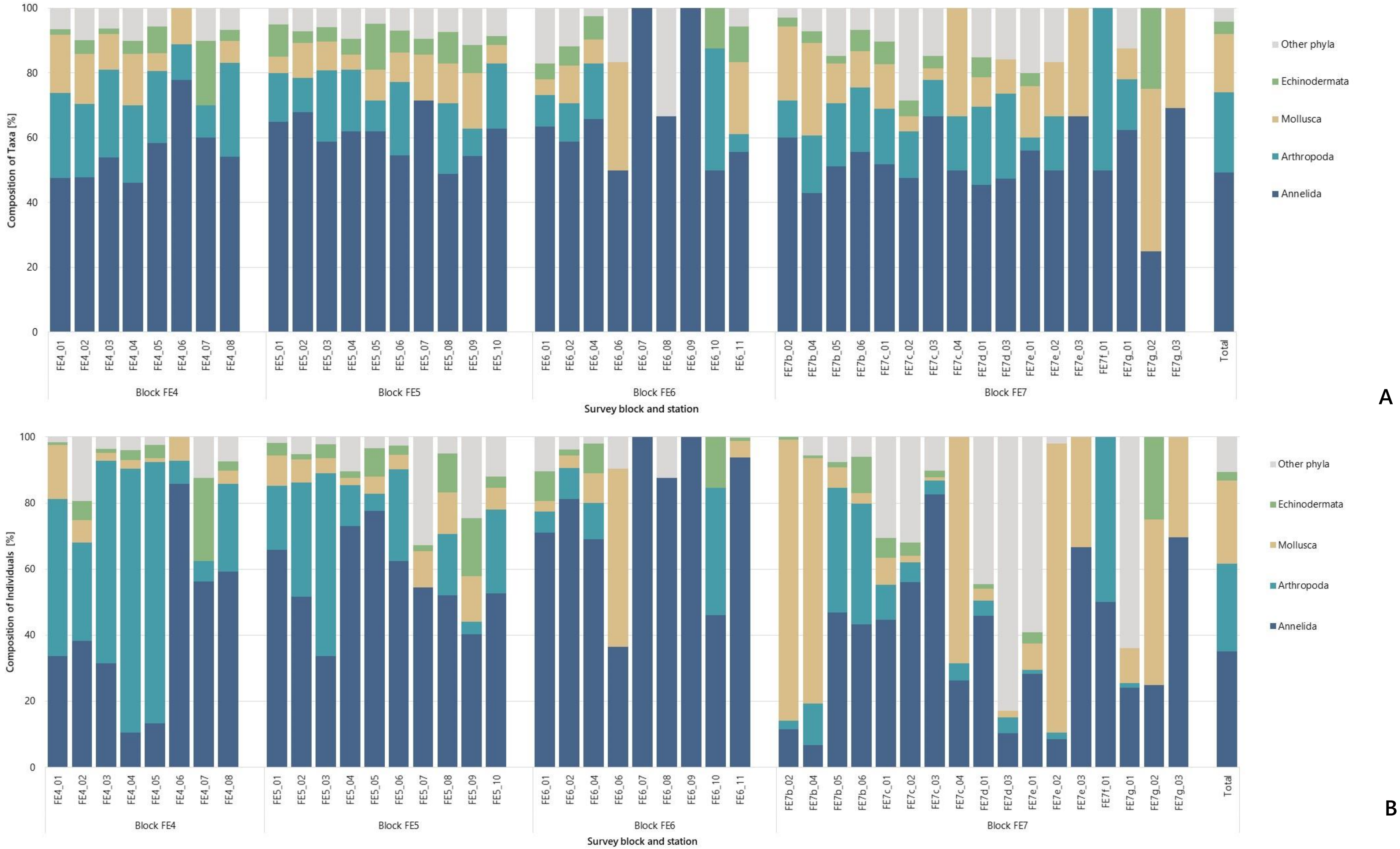


Figure 4.16: Phyletic composition of enumerated macrofaunal (A) taxa and (B) individuals, export cable route Five Estuaries Offshore Site Investigation

4.4.3.2 Community Statistics

Table 4.21 presents the results of the univariate analysis of the enumerated macrofaunal dataset, which provided information on faunal richness and diversity and allow contextualising the results within the geographical context of the study area. Univariate indices included faunal richness (Margalef's index d), diversity (Shannon-Wiener Index $H'Log_2$), evenness (Pielou's index J') and dominance (Simpson's index λ).

The number of taxa ranged from 2 (station FE7f_01) to 71 (station FE4_02), with a mean of 27 and a median of 26, along the ECR. Stations in survey block FE6 had the highest variation in the number of taxa, with a range of 3 to 41 taxa per station and five stations having less than 10 taxa. Stations in survey block FE5 had the lowest variation in the number of taxa, with a range of 20 to 68 taxa per station.

The number of individuals ranged from 2 (station FE7f_01) to 1739 (station FE7b_02), with a mean of 191 and a median of 95 along the ECR. Stations in survey block FE7 had the highest variation of abundance, with a range of 2 to 1739 individuals per station, whereas stations in survey block FE4 had the lowest variation, with a range of 14 to 812 individuals per station.

Values of richness reflected the number of individual per taxa recorded, with values ranging from 0.96 (station FE6_08) to 12.5 (station FE4_02) with a mean of 5.41 and a median of 5.13 along the ECR. On average, stations in survey block FE4 had higher values of richness with a range of 3.03 to 12.5, whereas stations in survey block FE6 had the lowest with a range of 0.96 to 8.69.

The Shannon-Wiener Diversity, assessed in line with the Dauvin et al., (2012) criteria (details in Section 3.3.3), was:

- high ($H'Log_2$ > 4.00) at 15 stations;
- good ($H'Log_2$ of 3.00 to 4.00) at 9 stations;
- moderate ($H'Log_2$ of 2.00 to 3.00) at 10 stations;
- poor ($H'Log_2$ of 1.00 to 2.00) at 8 stations;
- bad ($H'Log_2$ = < 1.00) at 2 stations

On average the diversity was high at stations in survey block FE5 (range of 3.12 to 4.91), good at stations in survey block FE4 (range of 2.48 to 5.22) and moderate at stations in survey blocks FE6 (range 0.85 to 4.82) and FE7 (range 0.84 to 4.48).

The evenness ranged from 0.204 (station FE6_11) to 1.000 (stations FE6_09, FE7e_03, FE7f_01 and FE7g_02). Analysis of the species list indicated that the low evenness value at station FE6_11 was associated with *L. koreni* which comprised 477 individuals, representing over 88 % of the macrofaunal abundance at this station. Similarly, the low evenness at station FE7b_02 (0.298) was associated with a numerical dominance of *Musculus discors*, which comprised 1376 individuals, representing 79 % of the macrofaunal abundance at this station. Stations FE6_09, FE7e_03, FE7f_01 and FE7g_02 comprised one individual for each taxon recorded, which resulted in the highest possible evenness value (J' = 1.000). High value of evenness

(J' ≥ 0.900) were recorded at seven stations which were characterised by low number of individuals relative to the taxa recorded.

Values of dominance were inversely related to those of evenness, so that low values of evenness corresponded to high values of dominance and vice-versa as it would be expected.

Table 4.21: Community statistics of enumerated fauna (0.1 m^2), export cable route, Five Estuaries Offshore Site Investigation

Station	Numbers		Richness	Diversity	Evenness	Dominance
	Taxa	Individuals	Margalef [d]	Shannon-Wiener [$H'Log_2$]	Pielou [J']	Simpson [λ]
Block FE4						
FE4_01	61	377	10.1	4.64	0.782	0.089
FE4_02	71	269	12.5	5.22	0.849	0.045
FE4_03	63	812	9.25	3.42	0.573	0.216
FE4_04	50	508	7.86	2.58	0.458	0.404
FE4_05	36	369	5.92	2.48	0.480	0.401
FE4_06	9	14	3.03	2.90	0.914	0.163
FE4_07	10	16	3.25	3.20	0.964	0.117
FE4_08	59	147	11.6	5.19	0.882	0.045
Block FE5						
FE5_01	20	108	4.06	3.12	0.722	0.192
FE5_02	28	58	6.65	4.30	0.895	0.076
FE5_03	68	403	11.2	4.39	0.722	0.112
FE5_04	21	48	5.17	3.94	0.898	0.089
FE5_05	21	58	4.93	3.49	0.795	0.171
FE5_06	44	184	8.25	4.53	0.829	0.075
FE5_07	21	55	4.99	3.68	0.837	0.131
FE5_08	41	119	8.37	4.91	0.917	0.042
FE5_09	35	102	7.35	4.39	0.856	0.073
FE5_10	35	91	7.54	4.49	0.875	0.069
Block FE6						
FE6_01	41	124	8.30	4.59	0.857	0.068
FE6_02	17	53	4.03	2.98	0.729	0.235
FE6_04	41	100	8.69	4.82	0.900	0.052
FE6_06	6	52	1.27	1.82	0.704	0.357
FE6_07	3	5	1.24	1.37	0.865	0.440
FE6_08	3	8	0.96	1.06	0.670	0.594
FE6_09	4	4	2.16	2.00	1.000	0.250
FE6_10	8	13	2.73	2.82	0.938	0.160

Station	Numbers		Richness	Diversity	Evenness	Dominance
	Taxa	Individuals	Margalef [d]	Shannon-Wiener [H'Log$_2$]	Pielou [J']	Simpson [λ]
FE6_11	18	538	2.70	0.85	0.204	0.789
Block FE7						
FE7b_02	35	1739	4.56	1.53	0.298	0.631
FE7b_04	28	264	4.84	2.72	0.565	0.314
FE7b_05	41	344	6.85	3.66	0.684	0.164
FE7b_06	45	217	8.18	4.48	0.815	0.077
FE7c_01	29	85	6.30	4.03	0.829	0.110
FE7c_02	21	50	5.11	4.01	0.914	0.078
FE7c_03	27	98	5.67	4.21	0.886	0.069
FE7c_04	6	19	1.70	1.73	0.671	0.435
FE7d_01	33	222	5.92	2.91	0.577	0.251
FE7d_03	19	146	3.61	1.92	0.452	0.490
FE7e_01	25	88	5.36	3.29	0.708	0.243
FE7e_02	6	47	1.30	0.84	0.324	0.765
FE7e_03	3	3	1.82	1.58	1.000	0.333
FE7f_01	2	2	1.44	1.00	1.000	0.500
FE7g_01	32	416	5.14	2.49	0.499	0.366
FE7g_02	4	4	2.16	2.00	1.000	0.250
FE7g_03	13	23	3.83	3.39	0.917	0.115
Minimum	**2**	**2**	**0.96**	**0.84**	**0.204**	**0.042**
Maximum	**71**	**1739**	**12.5**	**5.22**	**1.000**	**0.789**
Median	**26**	**95**	**5.13**	**3.25**	**0.829**	**0.167**
Mean	**27**	**191**	**5.41**	**3.16**	**0.756**	**0.242**
Standard deviation	**19**	**297**	**3.02**	**1.28**	**0.201**	**0.198**

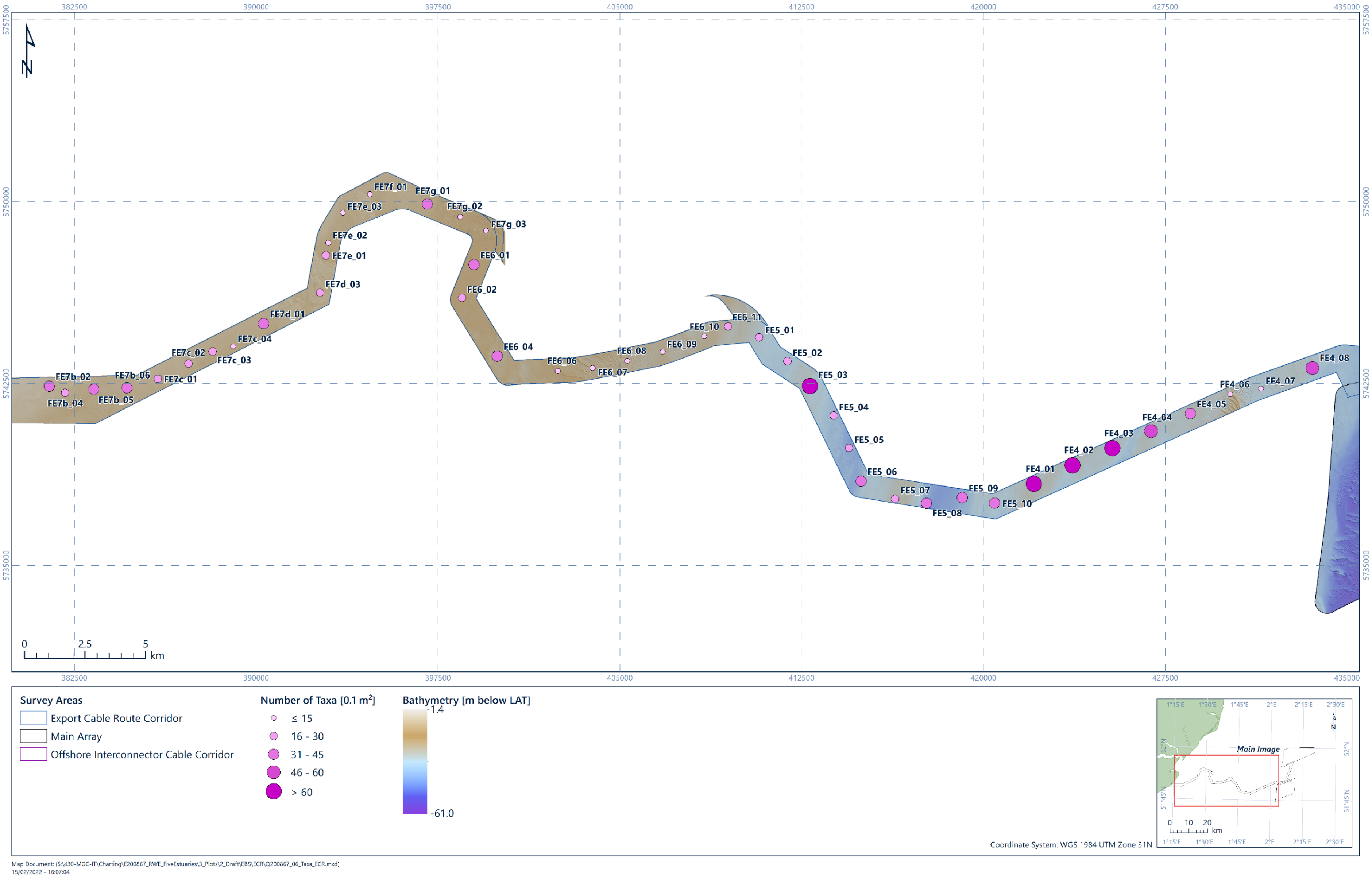


Figure 4.17: Number of macrofaunal taxa (0.1 m^2), export cable route, Five Estuaries Offshore Site Investigation

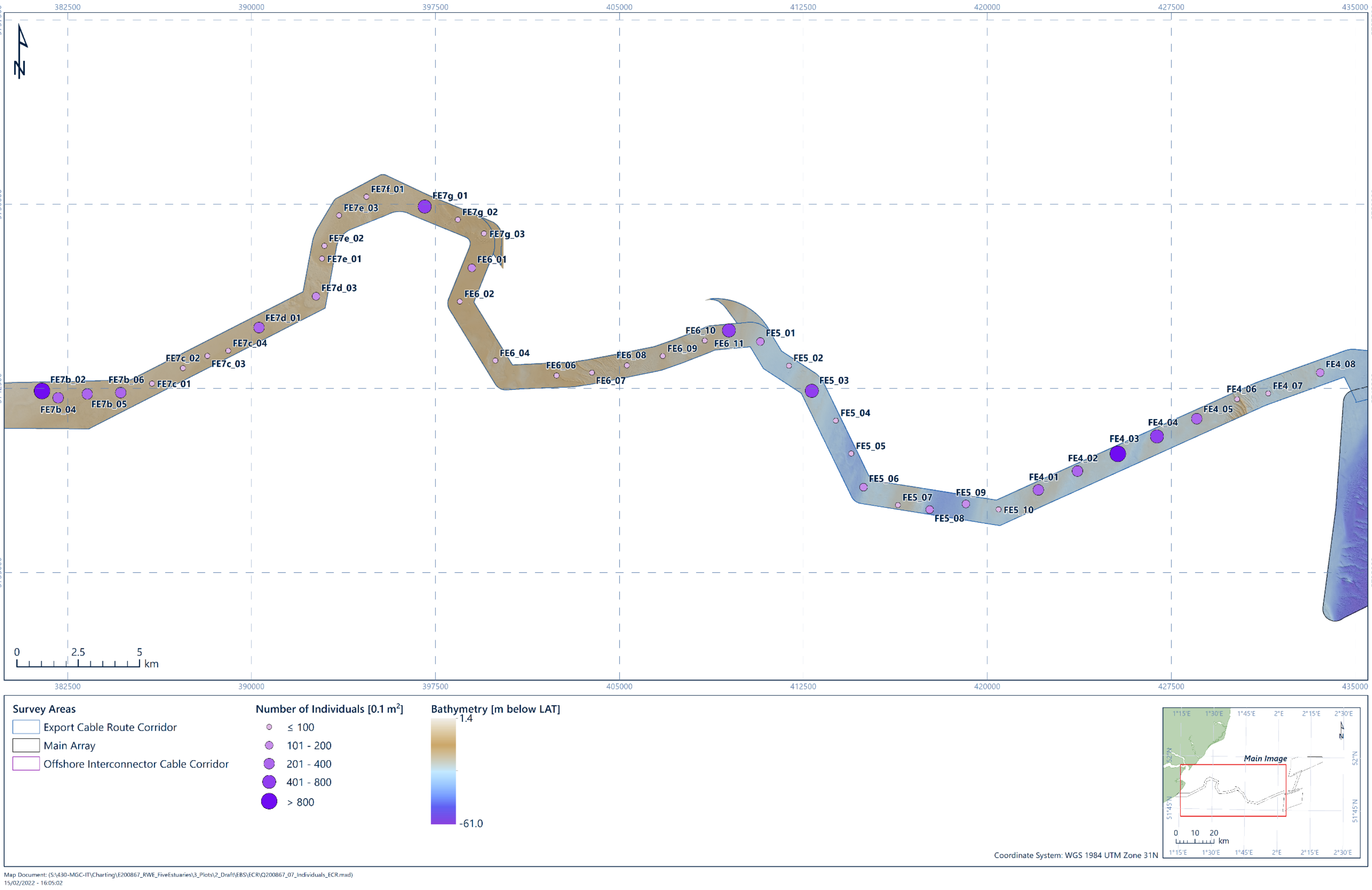


Figure 4.18: Number of macrofaunal individuals (0.1 m^2), export cable route Five Estuaries Offshore Site Investigation

4.4.3.3 Investigation of Faunal Similarities

The enumerated macrofaunal dataset was transformed prior to multivariate analysis. A fourth root transformation provided the best assessment, down weighting the numerically dominant species and allowing more detailed interrogation of less abundant taxa and the underlying community.

Faunal similarities were investigated using the hierarchical clustering analysis, results of which are in Figure 4.19 and Figure 4.20. The SIMPROF test, undertaken in conjunction with the cluster analysis, was interpreted in ecological terms and, where appropriate, coarser groups were created (see Section 3.3.5). Using Figure 4.19, four groups of samples were identified at a similarity of 10 %. Of these, group E was split into further seven groups at a similarity of 31 %.

Stations FE7e_03 and FE7F_01 separated at a similarity of 1 %, were therefore considered outliers and removed from the nMDS representation. The nMDS representation has a relatively high stress coefficient (details in Section 3.3.5), however, there is good correspondence between dendrogram and nMDS and as such the nMDS is deemed representative of the stations' two-dimensional ordination.

The groups identified through the multivariate analysis were further assessed by means of the SIMPER analysis. Table 4.11 presents the top ten characterising taxa identified through the SIMPER analysis along with a summary of the physical variables characterising each multivariate group; the average abundance of the characterising taxa refers to untransformed data.

Figure 4.21 presents the nMDS of hierarchical clustering analysis with superimposed multivariate groups and circles proportional in diameter to the abundance of taxa responsible for the separations of the multivariate groups.

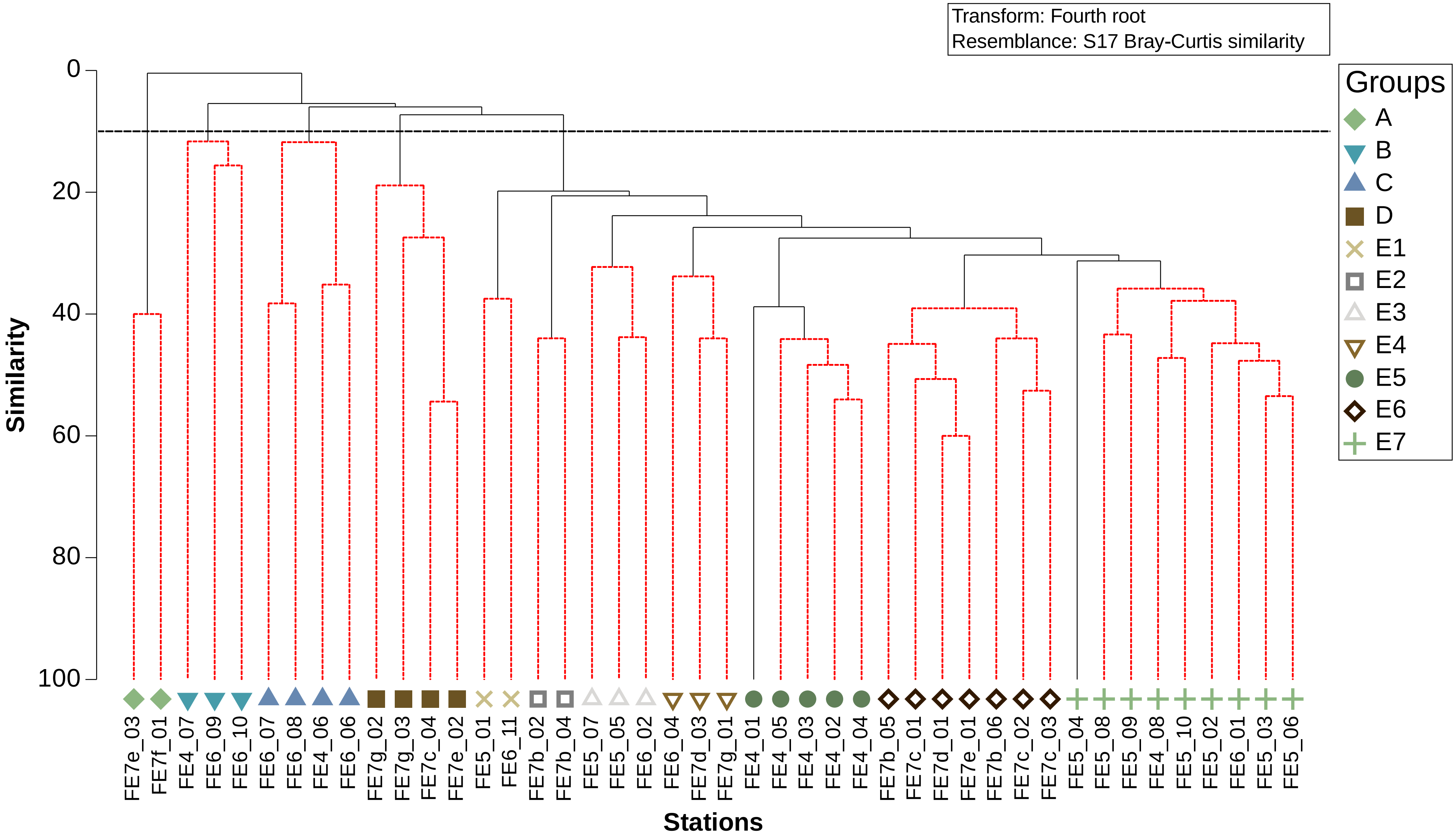
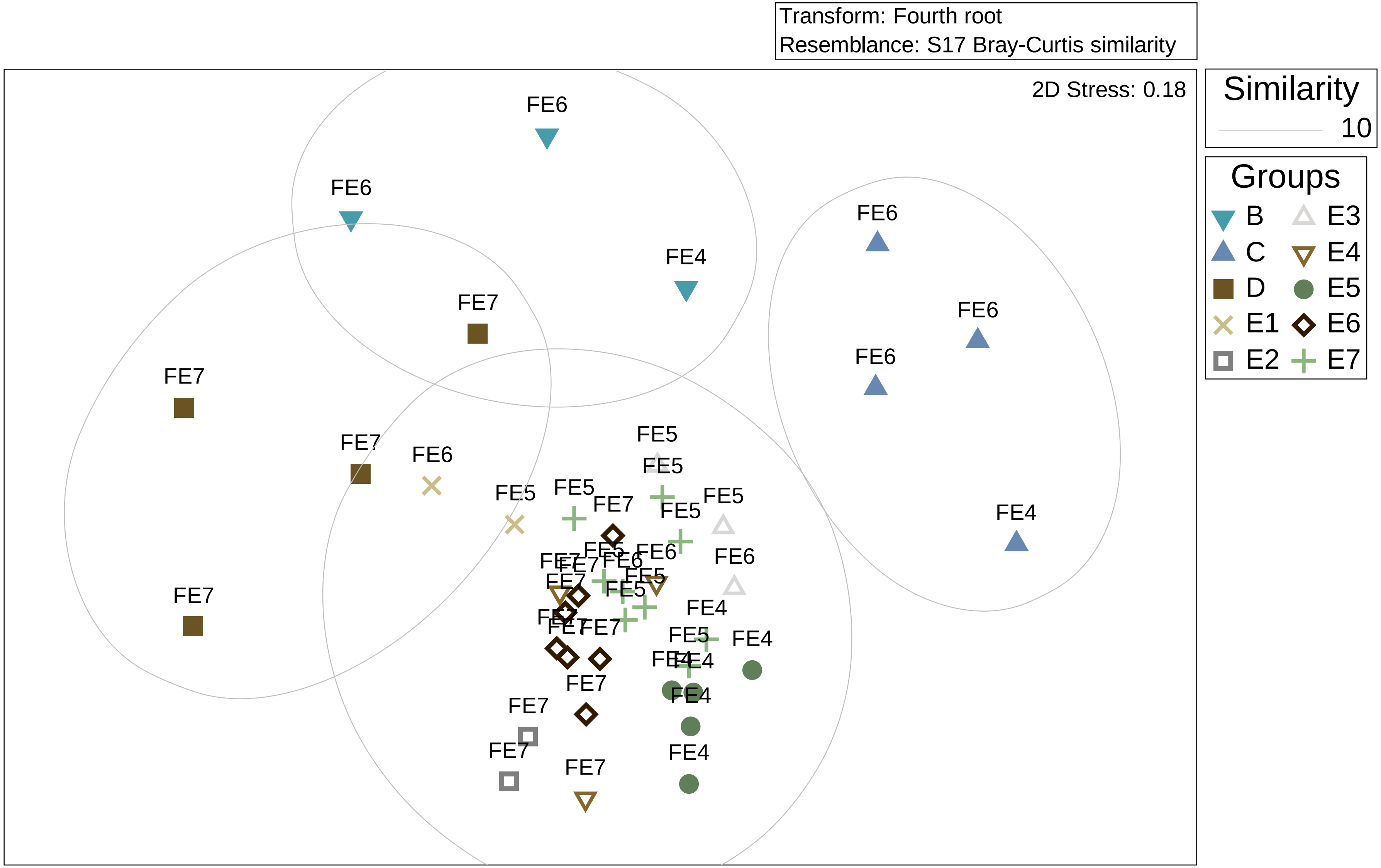


Figure 4.19: Dendrogram of hierarchical clustering analysis of enumerated fauna, export cable route, Five Estuaries Offshore Site Investigation



Notes

Group A comprising stations FE7e_03 and FE7f_01 has been removed for better representation of the 2D nMDS

Figure 4.20: nMDS of hierarchical clustering analysis of enumerated fauna, with superimposed survey blocks, export cable route, Five Estuaries Offshore Site Investigation

Group A comprised two stations from survey block FE7 and had an average similarity of 40.0 %. It was characterised by poorly sorted 'sandy gravel' (Folk BGS modified), with a mean median sediment particle size of 5851 µm (fine pebble), in mean water depth of 10.3 m BSL. Group A had mean numbers of three taxa and three individuals, of which *Magelona johnstoni* was recorded at both stations. The other invertebrates included the polychaete *Travisia forbesii*, the amphipod *Bathyporeia pelagica* and the bivalve *Nucula nucleus*.

Group B comprised three stations, including one from survey block FE4 and two from survey block FE6 and had an average similarity of 13.0 %. It was characterised by very poorly sorted 'sandy gravel' (Folk BGS modified), with mean median sediment particle size of 7860 µm (medium pebble), in mean water depth of 23.0 m BSL. Group B had mean numbers of 7 taxa and 11 individuals, of which the polychaetes *Spiophanes bombyx* (agg.), *Ophelia borealis* and *Nephtys cirrosa* where the characterising taxa.

Group C comprised four stations, including one from survey block FE4 and three from survey block FE6 and had an average similarity of 20.1 %. It was characterised by poorly sorted 'gravelly sand' (Folk BGS modified), with mean median sediment particle size of 929 µm (coarse sand), in mean water depth of 19.8 m BSL. Group C had mean numbers of 5 taxa and 20 individuals, of which the polychaetes *Hesionura elongata*, *Pisione remota*, *Glycera lapidum* and species of *Notomastus* were the characterising taxa along with Nemertea. Twenty-six individuals of the bivalve *Goodallia triangularis* were recorded at station FE6_06 within this group.

Group D comprised four stations from survey block FE7 and had an average similarity of 27.7 %. It was characterised by poorly sorted 'muddy sand' (Folk BGS modified), with mean median sediment particle size of 123 µm (fine sand), in mean water depth of 12.5 m BSL. Group D had mean numbers of 7 taxa and 23 individuals, of which the bivalves *Nucula nitidosa* and *Modiolula phaseolina*, the polychaetes *Nephtys hombergii*, *Lagis koreni* and *Ampharete lindstroemi*, and the cumacean *Diastylis bradyi*, were the characterising taxa. Four individuals of the bivalve *Abra alba* were recorded at station FE7g_03 within this group.

Group E1 comprised two stations from survey blocks FE5 and FE6 and had an average similarity of 37.5 %. It was characterised by very poorly sorted 'gravelly muddy sand' (Folk BGS modified), with mean median sediment particle size of 569 µm (coarse sand), in mean water depth of 26.0 m BSL. Group E1 had mean numbers of 19 taxa and 321 individuals, of which the polychaetes *L. koreni*, *Pholoe inornata*, *Eunereis longissima* and *Sabellaria spinulosa*, the bivalve *Kurtiella* (formerly *Mysella*) *bidentata* and the brittlestar *Ophiura albida*, were the characterising taxa, along with Nemertea.

Group E2 comprised two stations from survey block FE7 and had an average similarity of 44.0 %. It was characterised by very poorly sorted 'gravelly sandy mud' (Folk BGS modified), with median sediment particle size of 49 µm (coarse silt), in mean water depth of 8.5 m BSL. Group E2 had mean numbers of 32 taxa and 1002 individuals, of which bivalves (*N. nucleus*, *A. alba* and *Musculus discors*), amphipods (*Ampelisca diadema* and *Haploops*), polychaetes

(*Nephtys kersivalensis*, *Lepidonotus squamatus*, *P. inornata* and *Hilbigneris pleijeli*) and brittlestars (*A. squamata*) were amongst the characterising taxa. Four individuals of the estuarine polychaete *Maxmuelleria lankesteri* were recorded at station FE7b_02 within this group.

Group E3 comprised three stations, including two from survey block FE5 and one from survey block FE6 and had an average similarity of 36.1 %. It was characterised by very poorly sorted 'muddy sandy gravel' (Folk BGS modified), with mean sediment particle size of 10 298 µm (medium pebble), in mean water depth of 26.3 m BSL. Group E3 had mean numbers of 20 taxa and 55 individuals, of which polychaetes (*Lumbrineris* cf. *cingulata*, *S. spinulosa*, *Caulleriella alata*, *Spirobranchus lamarcki*, *Aonides paucibranchiata*, *Laonice irinae* and *Chaetozone zetlandica*), Nemertea, *Verruca stroemia* and *A. squamata* were amongst the characterising taxa.

Group E4 comprised three stations including one from survey block FE6 and two from survey block FE7 and had an average similarity of 37.2 %. It was characterised by very poorly sorted 'sandy gravel' (Folk BGS modified), with mean median sediment particle size of 12 353 µm (coarse pebble), in mean water depth of 12.2 m BSL. Group E4 had mean numbers of 31 taxa and 221 individuals, of which polychaetes (*S. spinulosa*, *L.* cf. *cingulata*, *L. koreni*, *Sthenelais boa*, *G. lapidum*, *Pseudopolydora pulchra*, *Pholoe inornata*, *Praxillella affinis*), tunicates (Ascidiacea) and anemones (Actiniaria), were amongst the characterising taxa.

Group E5 comprised five stations from survey block FE4 and had an average similarity of 43.8 %. It was characterised by extremely poorly sorted 'muddy sandy gravel' (Folk BGS modified), with mean median sediment particle size of 3794 µm (granule) in mean water depth of 26.0 m BSL. Group E5 had mean numbers of 56 taxa and 467 individuals of which crustacea (*Pisidia longicornis* and *Apseudes talpa*), limpets (*Verruca stroemia*), brittlestars (*A. squamata*), polychaetes (*S. lamarcki*, *Dipolydora flava*, *P. inornata*, *L.* cf. *cingulata*) species of *Phoronis*, and Nemertea, were amongst the characterising taxa, along with the amphipod *Monocorophium sextonae* and the polychaete *S. spinulosa*, albeit these two latter did not feature in the top ten.

Group E6 comprised seven stations from survey block FE7 and had an average similarity of 43.1 %. It was characterised by extremely poorly sorted 'muddy sandy gravel' (Folk BGS modified), with mean median sediment particle size of 8704 µm (medium pebble), in mean water depth of 9.6 m BSL. Group E6 had mean numbers of 32 taxa and 158 individuals, of which polychaetes (*A. lindstroemi*, *Notomastus*, *L.* cf. *cingulata*, *D. flava*, *L. koreni*, *P. inornata*), brittlestars (*A. squamata*), sipuncula (*Golfingia elongata*), and species of *Phoronis* and Nemertea, were amongst the characterising taxa. The polychaete *S. spinulosa* was also amongst the characterising taxa, albeit not in the top ten taxa and had notable abundance at stations FE7b_05 and FE7d_01, with 89 and 72 individuals, respectively.

Group E7 comprised nine stations including one from survey block FE4, seven from survey block FE5 and one from survey block FE6. It had an average similarity of 37.7 % and was characterised by extremely poorly sorted mixed sediments, with gravel, sand and mud having mean content of 26.46 %, 34.82 % and 37.72 %, respectively. The mean sediment particle size was 1484 µm and the mean water depth was 31.2 m BSL. Group E7 had mean numbers of 41 taxa and 142 individuals, of which polychaetes (*L*. cf. *cingulata*, *A. oxycephala*, *Paucibranchia totospinata*, *Scalibregma inflatum*, *A. lindstroemi* and species of *Notomastus*), chitons (*Leptochiton asellus*), brittlestars (*Ophiura albida*), and species and *Phoronis* and Nemertea. The bivalve *K. bidentata* was also amongst the characterising taxa, albeit not in the top ten taxa, along with *A. alba* although the latter was recorded at lower abundance and frequency of occurrence.

Taxa responsible for the separations of group E included (but were not limited to) the bivalves *K. bidentata* and *N. nucleus* and the polychaetes *L. koreni* and *S. lamarcki* (Figure 4.21), and to a lesser degree *S. spinulosa*, the latter associated with difference in the abundance of this species which was recorded at most stations in groups E1 to E7.

The combination of physical variables (percentages of sediment fractions and depth) that best explained the observed pattern of macrofaunal distribution included percentages of very coarse sand, fine sand and very coarse silt, as identified through the BIOENV analysis, which returned the highest value of rho of 0.665 at a significance level of 1 % for this combination of variables.

Figure 4.22 illustrates the relationships between sediment type and macrofauna, highlighting an increase in enumerated faunal diversity ($H'Log_2$) with increased sediment coarseness and heterogeneity.

Table 4.22: Summary of attributes of multivariate groups of enumerated macrofauna, Five Estuaries Offshore Site Investigation

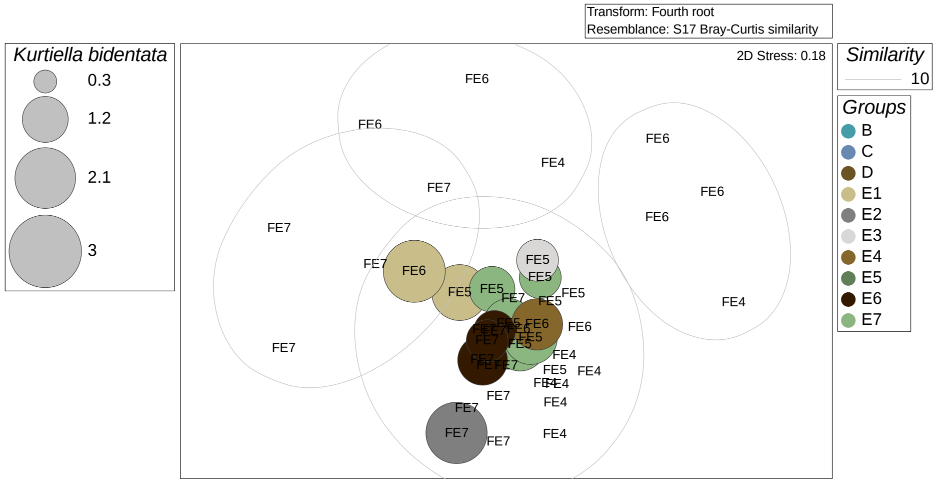
Group	Station	Characterising Features	Characterising Taxa	Abundance [N]	Frequency [%]	Contribution to Similarity [%]
A Average similarity: 40.0 %	FE7e_03, FE7f_01	Taxa: 2 Individuals: 2 Depth [m BSL]: 10.3 Gravel [%]: 53.97 Sand [%]: 42.08 Fines [%]: 3.95 Median [µm]: 5851 Sorting [µm]: 8.69	*Magelona johnstoni*	1.0	100	100
B Average similarity: 13.0 %	FE4_07, FE6_09, FE6_10	Taxa: 8 Individuals: 13 Depth [m BSL]: 23.0 Gravel [%]: 54.19 Sand [%]: 41.29 Fines [%]: 4.52 Median [µm]: 7860 Sorting [µm]: 8.71	*Spiophanes bombyx* (agg.)	1.3	66.7	40.1
			Ophelia borealis	0.7	66.7	34.1
			Nephtys cirrosa	1.0	66.7	25.8
C Average similarity: 20.1 %	FE4_06, FE6_06, FE6_07, FE6_08	Taxa: 5 Individuals: 20 Depth [m BSL]: 19.8 Gravel [%]: 18.94 Sand [%]: 80.92 Fines [%]: 0.14 Median [µm]: 929 Sorting [µm]: 2.19	*Notomastus*	1.0	75.0	34.8
			Hesionura elongata	2.3	50.0	31.7
			Nemertea	1.5	50.0	13.1
			Pisione remota	4.8	50.0	11.6
			Glycera lapidum	0.5	50.0	8.8

Group	Station	Characterising Features	Characterising Taxa	Abundance [N]	Frequency [%]	Contribution to Similarity [%]
D ■ Average similarity: 27.7 %	FE7c_04, FE7e_02, FE7g_02, FE7g_03	Taxa: 13 Individuals: 23 Depth [m BSL]: 12.5 Gravel [%]: 0.19 Sand [%]: 57.30 Fines [%]: 42.51 Median [μm]: 123 Sorting [μm]: 5.23	*Nucula nitidosa*	14	100	53.7
			Nephtys hombergii	1.5	75.0	20.7
			Diastylis bradyi	0.5	50.0	8.1
			Modiolula phaseolina	0.5	50.0	6.5
			Lagis koreni	1.3	50.0	5.6
			Ampharete lindstroemi	0.5	50.0	5.4
E1 ✕ Average similarity: 37.5 %	FE5_01, FE6_11	Taxa: 19 Individuals: 323 Depth [m BSL]: 26.0 Gravel [%]: 28.55 Sand [%]: 56.19 Fines [%]: 15.26 Median [μm]: 569 Sorting [μm]: 13.1	*Lagis koreni*	259	100	26.2
			Kurtiella bidentata	17	100	18.5
			Ophiura albida	4.0	100	13.7
			Pholoe inornata	2.5	100	10.4
			Eunereis longissima	1.0	100	10.4
			Sabellaria spinulosa	5.5	100	10.4
			Nemertea	1.5	100	10.4
E2 □ Average similarity: 44.0 %	FE7b_02, FE7b_04	Taxa: 32 Individuals: 1002 Depth [m BSL]: 8.5 Gravel [%]: 12.87 Sand [%]: 23.35 Fines [%]: 63.78 Median [μm]: 49 Sorting [μm]: 12.75	*Nucula nucleus*	116	100	14.7
			Ampelisca diadema	21	100	10.2
			Haploops	14	100	7.5
			Musculus discors	691	100	7.5
			Nephtys kersivalensis	23	50.0	5.7
			Abra alba	3.5	100	5.7
			Sabellaria spinulosa	7.0	100	5.7
			Lepidonotus squamatus	1.5	100	4.8
			Pholoe inornata	3.0	100	4.8
			Hilbigneris pleijeli	1.5	100	4.8

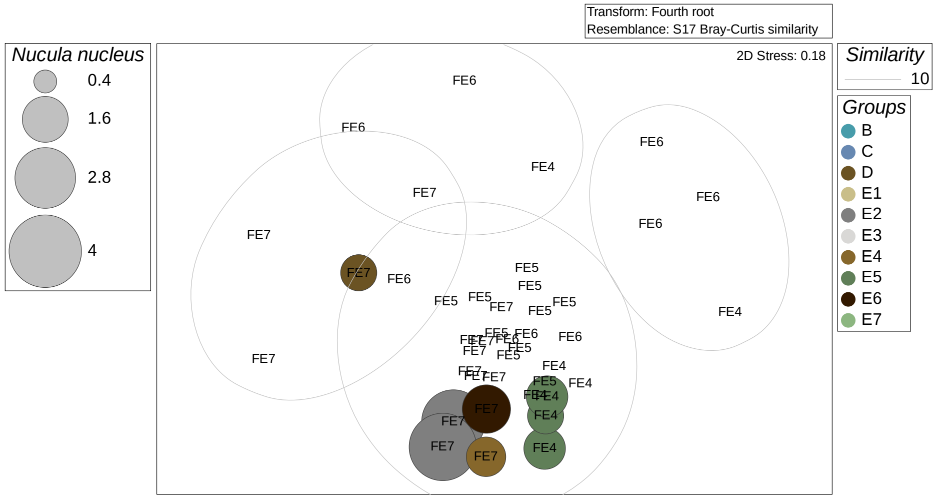
Group	Station	Characterising Features	Characterising Taxa	Abundance [N]	Frequency [%]	Contribution to Similarity [%]
E3 △ Average similarity: 36.1 %	FE5_05, FE5_07, FE6_02	Taxa: 20 Individuals: 55 Depth [m BSL]: 26.3 Gravel [%]: 61.79 Sand [%]: 27.91 Fines [%]: 10.30 Median [µm]: 10 298 Sorting [µm]: 12.03	*Lumbrineris* cf. *cingulata*	3.3	100	15.2
			Sabellaria spinulosa	2.7	100	15.2
			Caulleriella alata	1.3	100	14.3
			Nemertea	1.3	100	12.0
			Spirobranchus lamarcki	15	66.7	12.0
			Aonides paucibranchiata	3.7	66.7	9.0
			Laonice irinae	0.7	66.7	5.6
			Verruca stroemia	1.7	66.7	4.1
			Amphipholis squamata	1.3	66.7	4.1
			Chaetozone zetlandica	0.7	66.7	4.1
E4 ▽ Average similarity: 37.2 %	FE6_04, FE7d_03, FE7g_01	Taxa: 31 Individuals: 221 Depth [m BSL]: 12.2 Gravel [%]: 66.46 Sand [%]: 31.89 Fines [%]: 1.66 Median [µm]: 12 353 Sorting [µm]: 5.84	*Sabellaria spinulosa*	18	100	10.6
			Lumbrineris cf. *cingulata*	3.7	100	8.4
			Ascidiacea	115	66.7	8.3
			Lagis koreni	6.3	100	7.7
			Sthenelais boa	1.7	100	7.5
			Glycera lapidum	1.7	100	7.5
			Pseudopolydora pulchra	1.3	100	7.1
			Actiniaria	13	66.7	5.6
			Pholoe inornata	3.7	66.7	3.1
E5 ● Average similarity: 43.8 %	FE4_01, FE4_02, FE4_03, FE4_04, FE4_05	Taxa: 56 Individuals: 457 Depth [m BSL]: 26.0 Gravel [%]: 44.56 Sand [%]: 36.29 Fines [%]: 19.16 Median [µm]: 3794 Sorting [µm]: 22.4	*Pisidia longicornis*	136	100	8.2
			Verruca stroemia	110	100	7.9
			Amphipholis squamata	9.8	100	5.0
			Spirobranchus lamarcki	7.0	100	4.2
			Phoronis	7.2	100	3.7
			Nemertea	4.6	100	3.7
			Dipolydora flava	4.6	100	3.4
			Pholoe inornata	1.6	100	3.2
			Lumbrineris cf. cingulata	13.4	80.0	3.1
			Apseudes talpa	4.6	80.0	2.9
E6 ◇	FE7b_05, FE7b_06, FE7c_01, FE7c_02,	Taxa: 32	*Ampharete lindstroemi*	5.4	100	8.5
			Notomastus	6.1	100	8.4

Group	Station	Characterising Features	Characterising Taxa	Abundance [N]	Frequency [%]	Contribution to Similarity [%]
Average similarity: 43.1 %	FE7c_03, FE7d_01, FE7e_01	Individuals: 158	*Lumbrineris* cf. *cingulata*	4.3	100	7.3
		Depth [m BSL]: 9.6	*Golfingia (Golfingia) elongata*	1.4	100	6.2
		Gravel [%]: 51.94	*Phoronis*	2.3	100	6.1
		Sand [%]: 26.90	*Amphipholis squamata*	4.1	85.7	5.2
		Fines [%]: 21.16	*Dipolydora flava*	5.3	85.7	5.0
		Median [µm]: 8704	Nemertea	3.0	85.7	5.0
		Sorting [µm]: 16.43	*Lagis koreni*	1.7	85.7	4.2
			Pholoe inornata	2.1	85.7	4.1
E7 Average similarity: 37.7 %	FE4_08, FE5_02, FE5_03, FE5_04, FE5_06, FE5_08, FE5_09, FE5_10, FE6_01		*Lumbrineris* cf. *cingulata*	11	100	8.5
		Taxa: 41	*Notomastus*	2.0	100	5.9
		Individuals: 142	Nemertea	2.1	88.9	5.2
		Depth [m BSL]: 31.2	*Aonides oxycephala*	3.3	88.9	5.1
		Gravel [%]: 26.46	*Paucibranchia totospinata*	1.6	88.9	4.5
		Sand [%]: 34.82	*Leptochiton asellus*	2.2	88.9	4.3
		Fines [%]: 38.72	*Scalibregma inflatum*	4.9	77.8	4.3
		Median [µm]: 1484	*Ampharete lindstroemi*	9.4	77.8	3.7
		Sorting [µm]: 18.46	*Ophiura albida*	3.9	77.8	3.7
			Phoronis	2.6	77.8	3.4

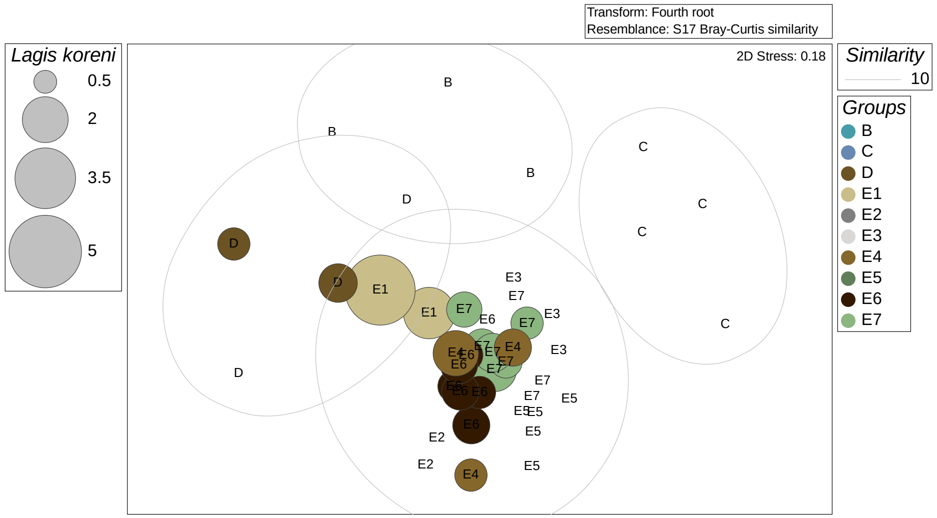
Notes
Values refer to mean of untransformed data within each multivariate group
Frequency refers to number of stations within each multivariate group
Taxa listed are the top ten identified by the SIMPER analysis (100 % percentage contribution)
Taxa listed in decreasing order of percentage contribution to similarity
BSL = Below sea level



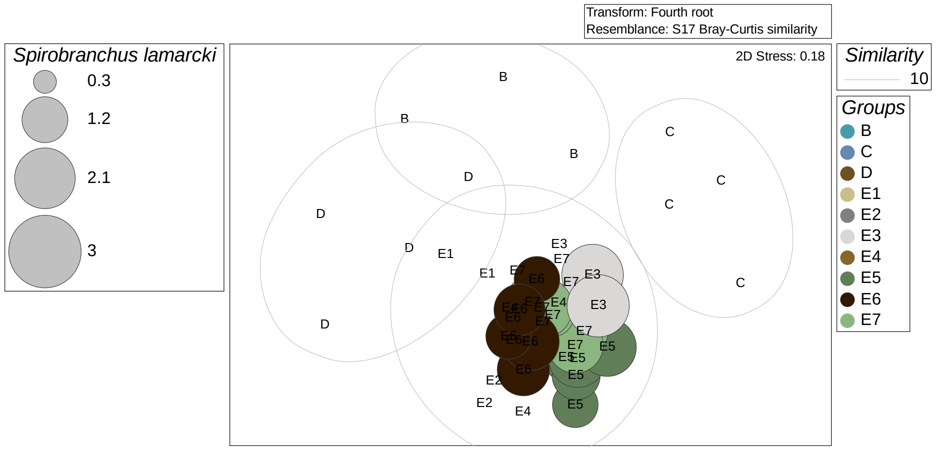
Notes
Circles proportional in diameter to the abundance of *Kurtiella bidentata*
Group A has been removed for better representation of the 2D nMDS



Notes
Circles proportional in diameter to the abundance of *Nucula nucleus*
Group A has been removed for better representation of the 2D nMDS

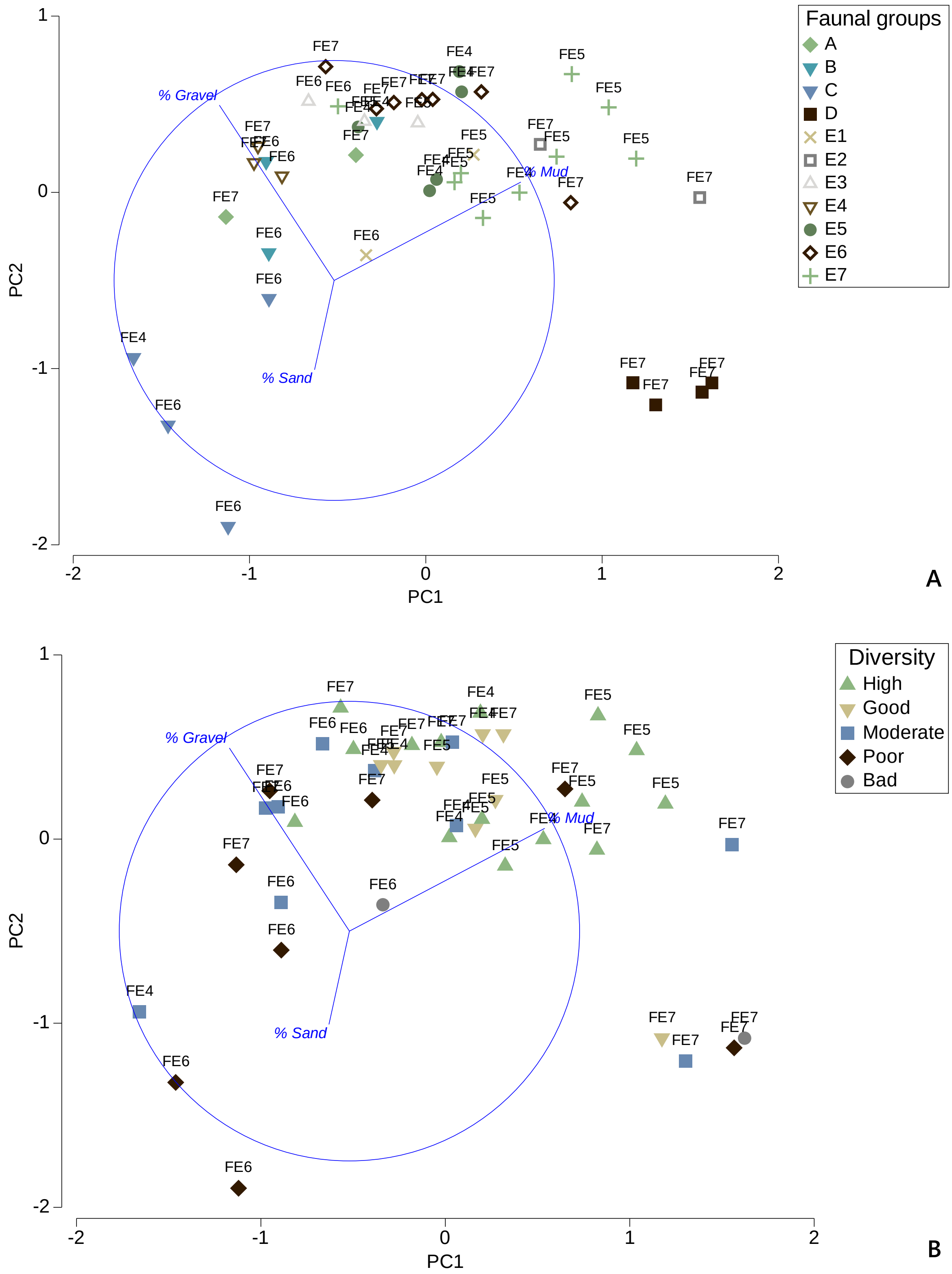


Notes
Circles proportional in diameter to the abundance of *Lagis koreni*
Group A has been removed for better representation of the 2D nMDS



Notes
Circles proportional in diameter to the abundance of *Spirobranchus lamarcki*
Group A has been removed for better representation of the 2D nMDS

Figure 4.21: nMDS of hierarchical clustering analysis with superimposed multivariate groups and circles proportional in diameter to the abundance of taxa responsible for the separations of groups, Five Estuaries Offshore Site Investigation



Notes
PC = Principal component

Figure 4.22: 2D PCA of sediment composition with superimposed survey blocks and macrofaunal (A) multivariate groups and (B) Shannon-Wiener [H'Log$_2$] index of diversity, export cable route, Five Estuaries Offshore Site Investigation

4.4.3.4 Biomass

Table 4.23 presents the percentage contribution of phyla to biomass along the ECR. It is worth noting that the biomass of Arthropoda comprises only invertebrates of the subphylum Crustacea. The biomass of the Arthropoda subphylum Chelicerata is reported within the biomass of other phyla. Table 4.24 presents the biomass of major taxonomic groups at each station. Figure 4.23 presents the association of biomass with sediment type highlighting higher values of biomass in more diverse sediments. Figure 4.24 presents the phyletic composition of the biomass at each station and Figure 4.25 presents the spatial variations of the total macrofaunal biomass across the survey area. Appendix F presents the raw data.

Table 4.23: Taxonomic groups of macrofaunal biomass, export cable route, Five Estuaries Offshore Site Investigation

Phylum	Biomass [AFDW g/0.1 m^2]	Biomass [%]
Annelida	15.525	36.7
Arthropoda	8.0908	19.1
Mollusca	8.8719	21.0
Echinodermata	9.0860	21.5
Other phyla	0.7394	1.7
Total	**42.313**	**100.0**

Notes
Annelida comprised oligochaeta and polychaeta
Other phyla included: Chelicerata, Cnidaria, Entoprocta, Hemichordata, Nemertea, Phoronida, Platyhelminthes and Sipuncula
Arthropoda comprises only invertebrates of the subphylum Crustacea

Annelida comprised most of the infaunal biomass (36.7 %) along the ECR, followed by Echinodermata (21.5 %), Mollusca (21.0 %) and Arthropoda (19.1 %), whereas other phyla comprised 1.7 % of the macrofaunal biomass.

The total biomass ranged from 0.0003 AFDW g/0.1 m^2 (station FE6_08) to 5.5707 AFDW g/0.1 m^2 (station FE6_11), with a mean of 0.9617 AFDW g/0.1 m^2 and a median of 0.2237 AFDW g/0.1 m^2.

The high value of biomass at station FE6_11 was associated with Annelida, the biomass of which was the highest along the ECR and associated with a numerical dominance of *L. koreni* at this station, as indicated by the analysis of the species list.

When assessed on a station basis, results indicated that the biomass of most phyla were associated with the abundance (see Section 4.4.3.1), as well as the presence of large taxa such as the echinoderms *Psammechinus miliaris*, *Echinocyamus pusillus* and *Echinocardium cordatum*, notably at stations in survey block FE5. Similarly, the high biomass of crustaceans at stations in survey block FE4 was associated with invertebrates' abundance as well as the presence of large taxa notably *Galathea intermedia* and *Pisidia longicornis*.

Table 4.24: Phyletic composition of macrofaunal biomass, export cable route, Five Estuaries Offshore Site Investigation

Station	Biomass					
	Annelida	Arthropoda	Mollusca	Echinodermata	Other Phyla	Total
Block FE4						
FE4_01	0.3757	0.4110	0.6772	0.0002	0.0020	**1.4661**
FE4_02	0.2786	0.1445	0.1401	0.3883	0.0119	**0.9634**
FE4_03	1.2594	0.1234	0.0115	0.0007	0.0071	**1.4021**
FE4_04	0.1148	1.8376	0.1898	0.2647	0.0037	**2.4106**
FE4_05	0.3087	1.4849	0.0269	0.3517	0.0011	**2.1733**
FE4_06	0.0090	0.0027	< 0.0001	-	0.0001	**0.0119**
FE4_07	0.0118	0.2328	0.0002	0.0079	0.0006	**0.2532**
FE4_08	0.5791	0.1921	1.0047	0.0290	0.0092	**1.8140**
Block FE5						
FE5_01	0.6705	0.1091	0.0028	0.0562	0.0030	**0.8416**
FE5_02	0.0859	0.0701	0.0008	0.0140	0.0038	**0.1747**
FE5_03	0.4069	0.4086	0.0060	0.3980	0.0197	**1.2391**
FE5_04	0.0514	0.0286	0.0001	0.1451	0.0042	**0.2295**
FE5_05	0.0471	0.0003	0.0039	0.1634	0.0032	**0.2179**
FE5_06	0.0213	0.4559	0.0042	1.3324	0.2750	**2.0888**
FE5_07	0.0516	-	0.0022	0.0166	0.0028	**0.0731**
FE5_08	0.3236	0.1072	0.0199	0.5819	0.0010	**1.0336**
FE5_09	0.0211	0.7607	0.0670	2.1735	0.0361	**3.0584**
FE5_10	0.1493	1.0182	0.0734	0.0486	0.0045	**1.2940**
Block FE6						
FE6_01	0.0604	0.0288	0.0322	0.5397	0.0434	**0.7045**
FE6_02	0.0251	0.0069	0.0783	0.0001	0.0007	**0.1112**
FE6_04	0.0706	0.0077	0.0118	1.1890	0.0013	**1.2804**
FE6_06	0.0107	-	0.0029	-	0.0008	**0.0144**
FE6_07	0.0017	-	-	-	-	**0.0017**
FE6_08	0.0003	-	-	-	< 0.0001	**0.0003**
FE6_09	0.0043	-	-	-	-	**0.0043**
FE6_10	0.0249	0.0011	-	0.0258	-	**0.0517**
FE6_11	5.4117	0.0006	0.0664	0.0919	0.0001	**5.5707**
Block FE7						
FE7b_02	0.3933	0.0290	4.6819	0.0022	0.0036	**5.1100**
FE7b_04	3.4624	0.0266	0.9415	0.0002	0.0011	**4.4317**
FE7b_05	0.4458	0.4597	0.3849	0.0003	0.0406	**1.3312**
FE7b_06	0.1003	0.0871	0.0443	1.1664	0.0476	**1.4458**
FE7c_01	0.0593	0.0052	0.0019	0.0283	0.0617	**0.1563**
FE7c_02	0.0618	0.0016	0.0006	0.0002	0.0700	**0.1344**
FE7c_03	0.0822	0.0160	0.0006	0.0477	0.0329	**0.1793**
FE7c_04	0.0751	0.0021	0.0228	-	0.0009	**0.1009**

Station	Biomass					
	Annelida	Arthropoda	Mollusca	Echinodermata	Other Phyla	Total
FE7d_01	0.1105	0.0102	0.0053	0.0212	0.0326	**0.1799**
FE7d_03	0.0099	0.0133	0.0076	-	0.0001	**0.0309**
FE7e_01	0.0787	0.0001	0.0040	0.0006	0.0086	**0.0920**
FE7e_02	0.0053	0.0009	0.0739	-	0.0021	**0.0821**
FE7e_03	0.0125	-	0.0045	-	-	**0.0170**
FE7f_01	0.0004	0.0003	-	-	-	**0.0007**
FE7g_01	0.1781	0.0059	0.2509	0.0002	0.0022	**0.4372**
FE7g_02	0.0004	-	0.0030	0.0001	-	**0.0034**
FE7g_03	0.0729	-	0.0221	-	< 0.0001	**0.0952**
Minimum	**0.0003**	**0.0001**	**< 0.0001**	**0.0001**	**< 0.0001**	**0.0003**
Maximum	**5.4117**	**1.8376**	**4.6819**	**2.1735**	**0.2750**	**5.5707**
Median	**0.0717**	**0.0287**	**0.0118**	**0.0290**	**0.0034**	**0.2237**
Mean	**0.3528**	**0.2247**	**0.2275**	**0.2753**	**0.0195**	**0.9617**
Standard deviation	**0.9554**	**0.4243**	**0.7704**	**0.4991**	**0.0465**	**1.3658**

Notes
Biomass expressed as ash free dry weight [AFDW] in g/0.1 m^2 grab sample
Arthropoda comprises only invertebrates of the subphylum Crustacea; arthropods of the subphylum Chelicerata are combined with the biomass of other phyla

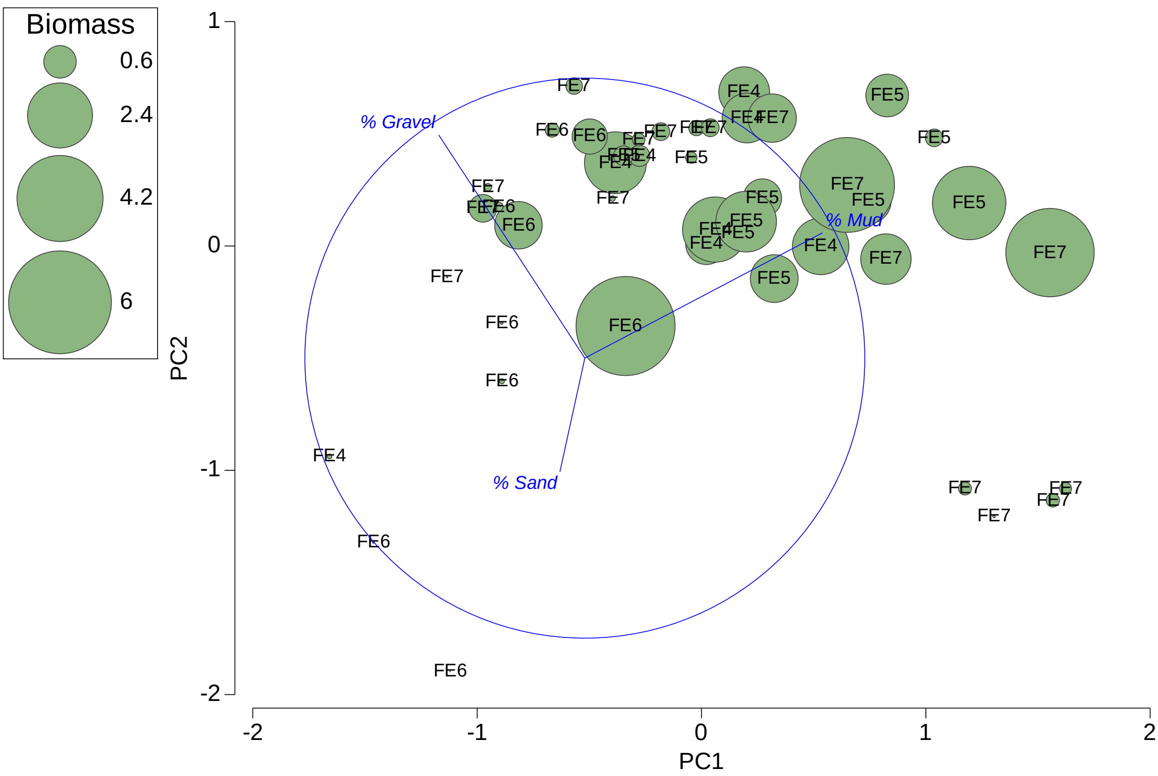
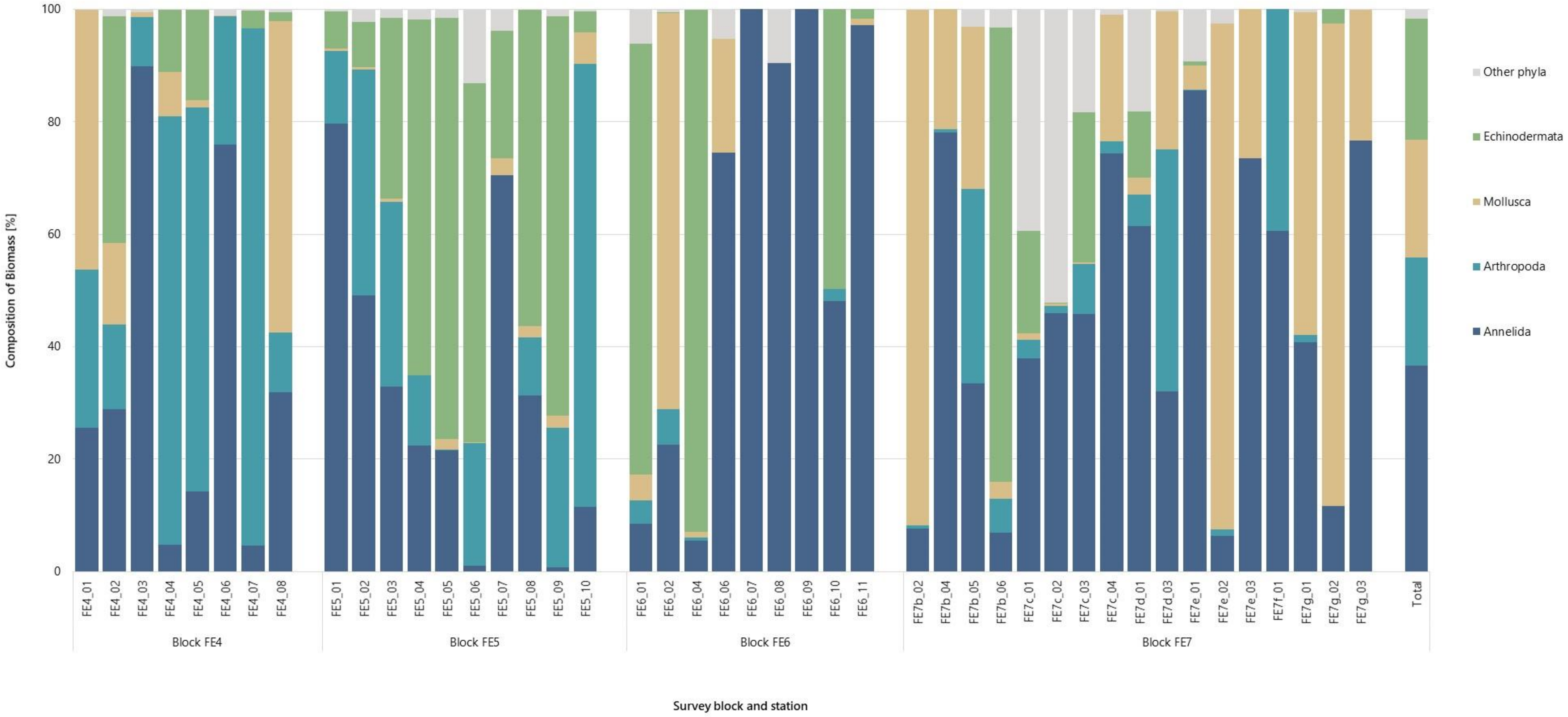


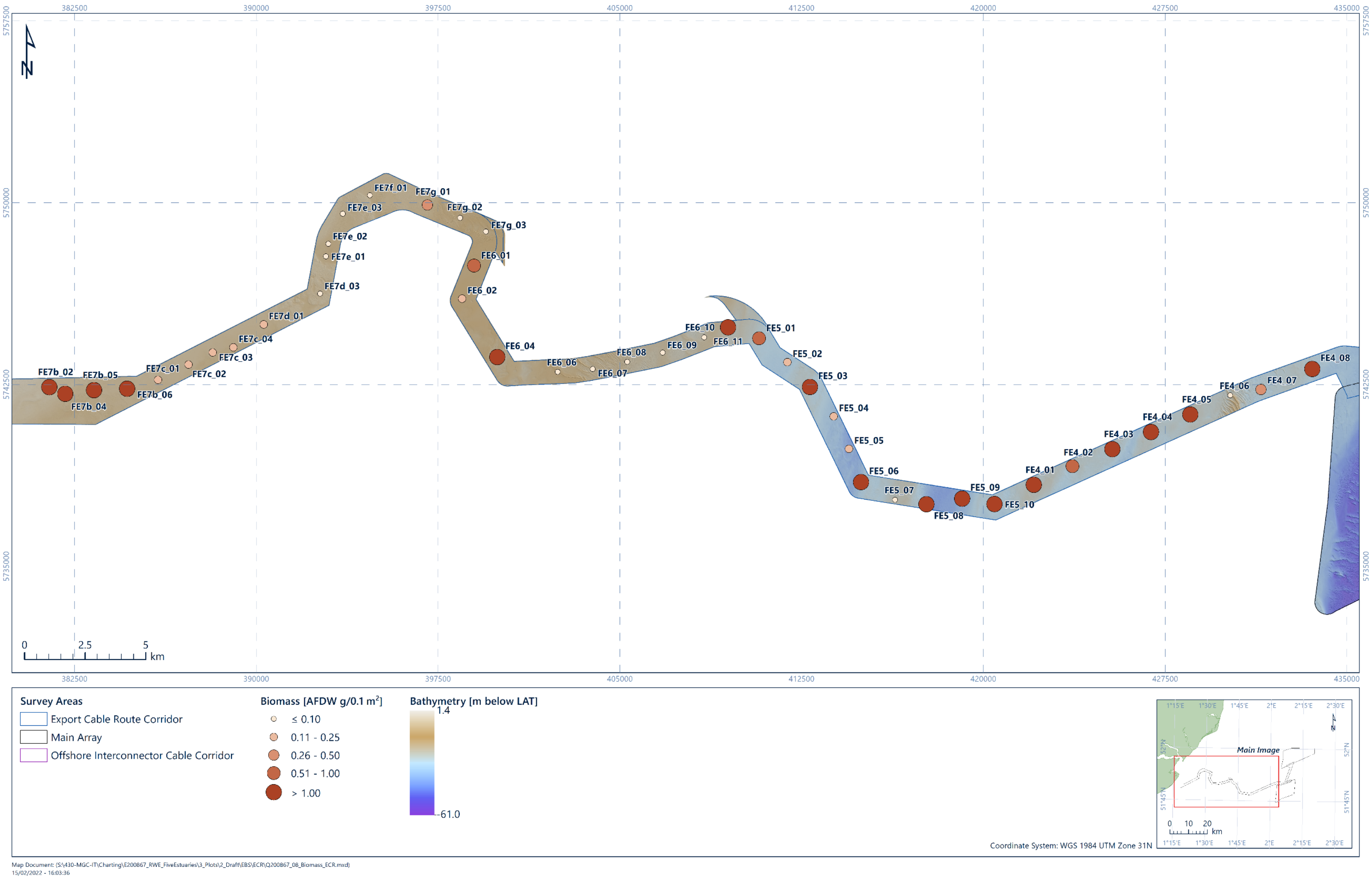
Figure 4.23: 2D PCA of sediment composition with superimposed survey blocks and circles proportional in diameter to the abundance of macrofaunal biomass expressed as ash free dry weight [AFDW] g/0.1 m^2, export cable route, Five Estuaries Offshore Site Investigation



Notes

Biomass expressed as ash free dry weight [AFDW] in g/0.1 m^2 grab sample

Figure 4.24: Phyletic composition of macrofaunal biomass, export cable route, Five Estuaries Offshore Site Investigation



Notes

Biomass expressed as ash free dry weight [AFDW] in g/0.1 m^2 grab sample

Figure 4.25: Spatial variation of macrofaunal biomass, export cable route, Five Estuaries Offshore Site Investigation

4.4.4 Colonial Epifauna

Colonial epifauna was recorded at 39 of the 44 stations sampled. Stations FE5_01, FE5_02, FE7c_04, FE7e_03 and FE7f_01 were devoid of colonial epifauna.

4.4.4.1 Phyletic Composition

Table 4.25 presents the community structure of sessile colonial epifauna and Table 4.26 presents the top ten most frequently occurring colonial epifaunal taxa along the ECR. Figure 4.26 illustrates the relationships between sediment type and the occurrence of colonial epifauna. Figure 4.27 presents the colonial epifauna community structure at single stations and Figure 4.28 presents the spatial variations of the number of epifaunal taxa across the survey area.

Table 4.25: Taxonomic groups of colonial epifauna, Five Estuaries Offshore Site Investigation

Taxonomic Group	Number of Taxa	Composition of Taxa [%]
Porifera	2	3.9
Cnidaria	13	25.5
Bryozoa	34	66.7
Chordata	1	2.0
Other phyla	1	2.0
Total	**51**	**100**

Notes
Macrofaunal samples were processed through a 1 mm sieve
Other phyla included Folliculinidae

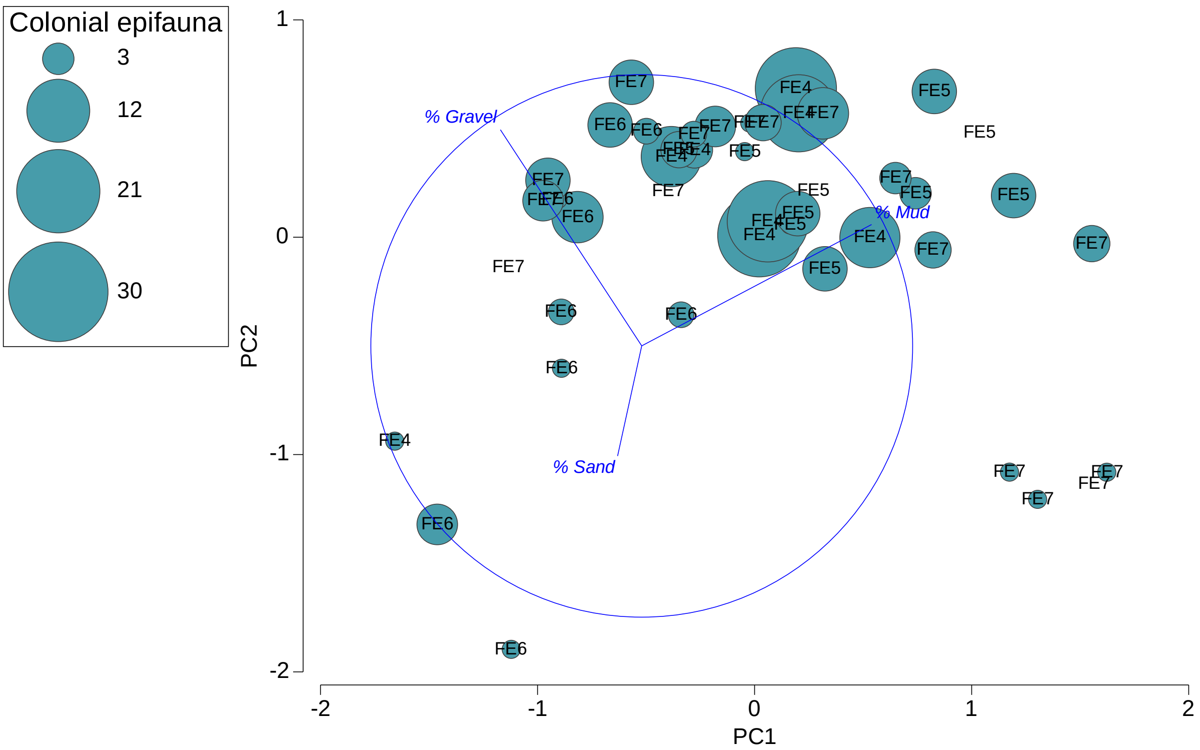
Five phyla of colonial epifauna were recorded at stations along the ECR; of these, Bryozoa comprised most of the taxa composition (66.7 %), followed by Cnidaria (25.5 %), Porifera (3.9 %) and Chordata (2.0 %), the latter comprising tunicates of the family Didemnidae. Other phyla comprised 2.0 % of the taxa composition (Table 4.25) and were represented by ciliates of the family Folliculinidae.

The bryozoan *Escharella immersa* was the most frequently occurring along with bryozoans of the genus *Schizomavella*. Other bryozoans most frequently recorded included *Aspidelectra melolontha*, *Conopeum reticulum*, *Electra pilosa* and *Disporella hispida*, whereas hydroids included *Alcyonium digitatum* and species of Sertulariidae. Species of Porifera and Folliculinidae also featured amongst the top five most frequently recorded colonial epifauna (Table 4.26).

Station FE4_02 had the highest number of colonial epifauna, indeed survey block FE4 had on average the highest number and diversity of colonial epifauna (Figure 4.27 and Figure 4.28).

Table 4.26: Top ten most frequently occurring colonial epifaunal taxa, export cable route, Five Estuaries Offshore Site Investigation

Taxon	Frequency [%]
Escharella immersa	53.8
Schizomavella	53.8
Aspidelectra melolontha	46.2
Conopeum reticulum	35.9
Folliculinidae	33.3
Porifera	23.1
Electra pilosa	23.1
Alcyonium digitatum	20.5
Disporella hispida	20.5
Sertulariidae	17.9



Notes
PC = Principal component

Figure 4.26: 2D PCA of sediment composition with superimposed circles proportional in diameter to the number of colonial epifauna, cable route, Five Estuaries Offshore Site Investigation

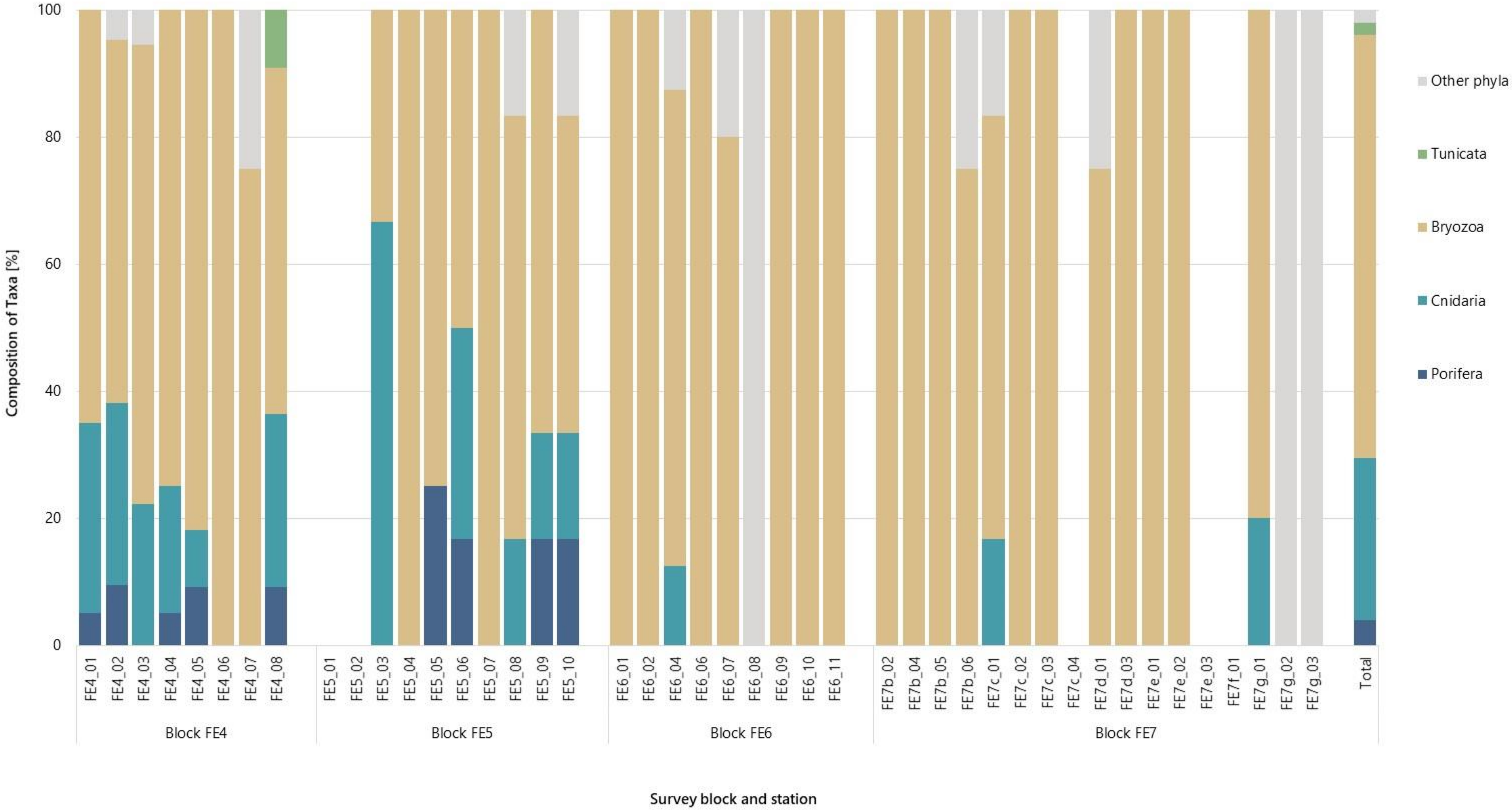


Figure 4.27: Phyletic composition of epifaunal taxa, export cable route, Five Estuaries Offshore Site Investigation

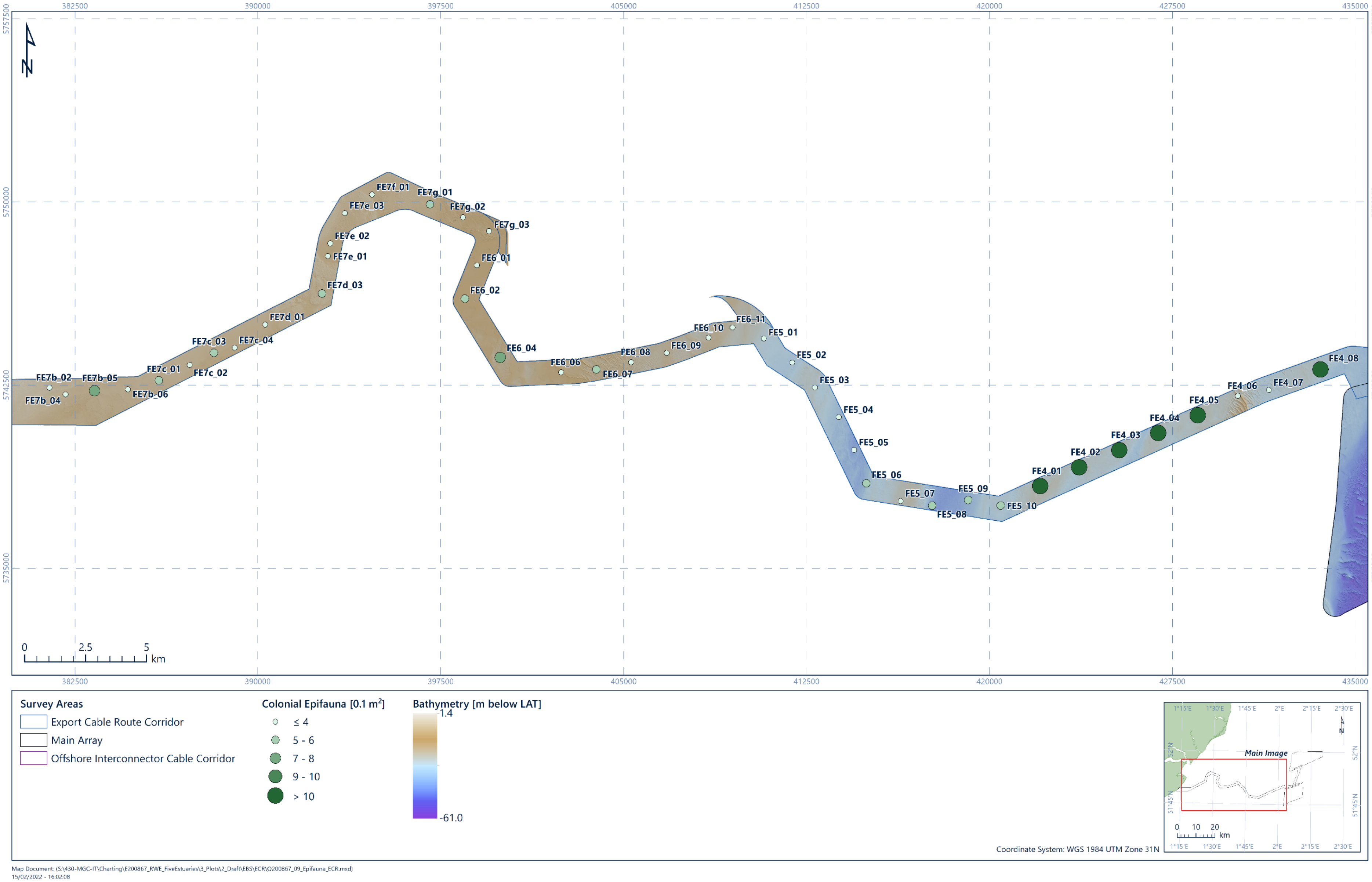


Figure 4.28: Spatial variations of the number of colonial epifauna (0.1m^2), export cable route, Five Estuaries Offshore Site Investigation

4.5 Seabed Habitats and Biotopes

4.5.1 Intertidal

Results of the physical and biological analysis from the core samples were used to further define the biotopes, particularly those of sedimentary habitats, identified during Phase I habitat mapping.

The habitats and biotopes identified across the intertidal area during Phase I habitat mapping were:

- 'Littoral rock and other hard substrata' (A1) (LR.), which describes rocky habitats including bedrock, boulders and cobbles (EEA, 2019). This habitat complex was assigned to areas of bare substrate subject to scour from the adjacent sedimentary areas, and two areas of exposed clay on the lower shore;
  - 'Mussel and/or Barnacle communities' (A1.11) (LR.HLR.MusB), described as communities on very exposed to moderately exposed upper and mid eulittoral bedrock and boulders dominated by mussels, barnacles and/or limpets (EEA, 2019). This biotope complex was assigned to three areas in the central part of the survey area, featuring cobbles and boulders in the mid to low shores;
  - *'Semibalanus balanoides* on exposed to moderately exposed or vertical shelter eulittoral rock' (A1.113) (LR.HLR.MusB.Sem), described as bedrock and large boulders on exposed to moderately exposed mid to upper eulittoral, characterised by dense barnacles *S. balanoides* and the limpet *Patella vulgata* (EEA, 2019). This biotope was assigned to several areas of stable boulders and wooden groynes. Fauna featured barnacles, including *S. balanoides* and *Austrominius* (formerly *Elminius*) *modestus*, the Pacific oyster *Magallana gigas* and *P. vulgata*;
  - 'Robust fucoid and/or red seaweed communities' (A1.12) (LH.HLR.FR), described as community of seaweeds able to tolerate the extreme conditions of very exposed to moderately exposed rocky shores (EEA, 2019). This biotope complex was assigned to two areas of boulders and sheet piling at low shore in the southern part of the survey area; seaweeds included *Corallina officinalis*, *Osmundea pinnatifida* and species of the genera *Polysiphonia*, *Phyllophora* and *Ulva*, whereas fauna included barnacles, *M. gigas*, and *P. vulgata*;
  - *'Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock' (A1.212) (LR.MLR.BF.FspiB), described as bedrock colonised by the fucoid *Fucus spiralis*, lichens (*Verrucaria maura* and *Verrucaria mucosa*) and the green alga *Ulva intestinalis* which can be prevalent in the summer. Fauna includes *P. vulgata*, *Littorina littorea* and *S. balanoides* (EEA, 2019). This biotope was dominant amongst the fucoid algae and was recorded on all hard substrate. Taxa additional to *F. spiralis* included *P. vulgata*, *L. littorea*, *M. gigas,* barnacles and species of *Ulva*;
  - *'Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock' (A1.213) (LR.MLR.BF.FvesB), described as community occurring below the *F. spiralis*

biotope and characterised by the fucoid *F. vesiculosus*. Other taxa include *P. vulgata* and the whelk *Nucella lapillus*, while a community of red seaweeds may develop beneath the *F. vesiculosus* canopy (EEA, 2019). This biotope was assigned to the *F. vesiculosus* communities occurring in small patches or narrow bands on sea defence boulders. Where present, this biotope occurred below the biotope '*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock' (A1.212). Typical fauna included barnacles, *P. vulgata* and species of *Littorina* and *Ulva*;

- '*Fucus serratus* on moderately exposed lower eulittoral rock' (A1.214) (LR.MLR.BF.Fser), described as a canopy of the fucoid *F. serratus* on stable boulders and bedrock on the lower shore. Typical fauna include *P. vulgata*, *S. balanoides*, *N. lapillus* and the anemone *Actinia equina*, whereas typical flora include species of *Ulva*, usually underneath the *F. serratus* canopy (EEA, 2019). This biotope was assigned to boulders on the lower shore, colonised by *F. serratus* with an under-canopy of green (*Ulva* spp.) and less frequently red (Rhodophyta) algae. Fauna included *P. vulgata*, *M. gigas* and species of *Littorina*;
- '*Enteromorpha* spp. on freshwater influenced and/or unstable upper eulittoral rock' (A1.451) (LR.FLR.Eph.Ent), described as unstable soft rock or stable rock on the upper shore subject to freshwater input and characterised by dense mats of *Ulva* spp. (EEA, 2019). This biotope was assigned to a narrow band of *Ulva* spp. on the seawalls, mostly beneath drainage pipes, in the central section of the survey area;
- '*Porphyra purpurea* or *Enteromorpha* spp. on sand-scoured mid or lower eulittoral rock' (A1.452) (LR.FLR.Eph.EntPor), described as bedrock and boulders in moderately exposed mid to lower shore adjacent to areas of sand, which results in reduced abundance of fucoid algae due to sand-abrasion. Typical fauna include *S. balanoides* and *A. modestus*, *P. vulgata* and species of *Littorina*. (EEA, 2019). This biotope was assigned to the biological communities colonising wooden groynes and rock armour across the mid shore section of the survey area. Flora included species of *Ulva* and *Porphyra*, less often *F. spiralis*. Fauna included *S. balanoides*, *A. modestus*, *P. vulgata* and species of *Littorina*.

- 'Littoral sediment' (A2) (LS) includes habitats of shingle, gravel, sand and mud or any combination of these which occur in the intertidal zone (EEA, 2019).
  - 'Littoral sand and muddy sand' (A2.2) (LS.LSa) is described as clean sand or muddy sand which can appear rippled as a result of wave action or tidal current. Littoral sands exhibit varying degrees of drying at low tide depending on the steepness of the shore, the sediment grade and the height on the shore, which determines the associated infaunal communities (EEA, 2019). This habitat was assigned to the sedimentary shore between the upper and lower shore. The sediment was sandy with varying proportions of gravel. At the lower shore, the sediment featured rippled sand with lugworms (*Arenicola marina*) and low densities of *L. conchilega* tubes.
  - 'Barren littoral shingle' (A2.111) (LS.LCS.Sh.BarSh) is described as shingle or gravel on exposed and fully marine shores which support little or no fauna owing to their

mobile and draining substratum; when present, fauna is represented by amphipod and small polychaetes (EEA, 2019). This biotope was assigned to a ~1 m wide area of gravel and coarse sand devoid of flora and fauna, in the central section of the survey area at base of sea defence boulders.

- *'Lanice conchilega* in littoral sand' (A2.245) (LS.LSa.MuSa.Lan) is described as flats of medium fine sand and muddy sand, most often on the lower shore, sometimes on waterlogged mid shores. The sediment supports dense populations of *L. conchilega* and polychaetes that are tolerant of sand scour or mobility of the sediment surface layers (EEA, 2019). This biotope was assigned to two areas of sand supporting high abundance of *L. conchilega* tubes, in between cobbles and boulders on the low shore in the central section of the survey area.

- 'Rock cliffs, ledges and shore, including the supralittoral' (B3), which describes rock exposures adjacent to the sea and associated coastal lagoons, or separated from them by a narrow shoreline (EEA, 2019).
  - *'Verrucaria maura* on very exposed to very sheltered upper littoral fringe rock' (B3.1132) (LR.FLR.Lic.Ver.Ver), which describes upper littoral fringe bedrock, boulders and stable cobbles on very exposed to very sheltered shores with a cover of the black lichen *V. maura* (EEA, 2019). This biotope is part of the 'Coastal habitat' section of the EUNIS classification (EEA, 2019) but is described under the 'Marine habitat' section of the JNCC classification as this part of the shore has historically been included in marine habitat mapping surveys (JNCC, 2015). Within the intertidal survey area, this biotope was restricted to a narrow band on a rock armour in the supralittoral zone.

Results of the core samples indicated that the sediments across the intertidal survey area were abiotic or species poor (detailed in Section 4.4.1) thus preventing the habitats assigned during the Phase I habitat mapping to be further re-defined.

Figure 4.29 presents photos representative of the habitats and biotopes recorded across the intertidal survey area and Figure 4.30 presents their spatial distribution.

'Littoral rock and other hard substrata' (A.1) (LR.)
Rock armour

'Littoral rock and other hard substrata' (A.1) (LR.)
Exposed low-lying clay with boulder

'*Verrucaria maura* on very exposed to very sheltered upper littoral fringe rock' (B3.1132) (LR.FLR.Lic.Ver.Ver)
Rock armour

'Mussel and/or barnacle communities' (A1.11) (LR.HLR.MusB)
Wooden groyne

'Robust fucoid and/or red seaweed communities' (A1.12) (LH.HLR.FR)
Boulder

'*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock' (A1.212) (LR.MLR.BF.FspiB)
Rock armour

'*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock' (A1.213) (LR.MLR.BF.FvesB)
Rock armour

'*Fucus serratus* on moderately exposed lower eulittoral rock' (A1.214) (LR.MLR.BF.Fser)
Rock armour

'*Enteromorpha* spp. on freshwater-influenced and /or unstable upper eulittoral rock' (A1.451) (LR.FLR.Eph.Ent)

Seawall

'*Porphyra purpurea* and *Entermorpha* spp. on sand-scoured mid or lower eulittoral rock' (A1.452) (LR.FLR.Eph.EntPor)

Wooden groyne

'Littoral sand and muddy sand' (A2.2) (LS.LSa)
Sedimentary shore

'Littoral sand and muddy sand' (A2.2) (LS.LSa)
Close up of sedimentary shore

'Barren littoral shingle' (A2.111) (LS.LCS.Sh.BarSh)
Coarse sediment at base of rock armour

'*Lanice conchilega* in littoral sand' (A2.245) (LS.LSa.MuSa.Lan) Sand in between cobbles and boulders with polychaete tubes

Notes
The currently accepted taxonomic name for *Enteromorpha* is *Ulva*, but the biotope classification has retained the old name

Figure 4.29: Representative photos of intertidal biotopes, Five Estuaries Offshore Site Investigation

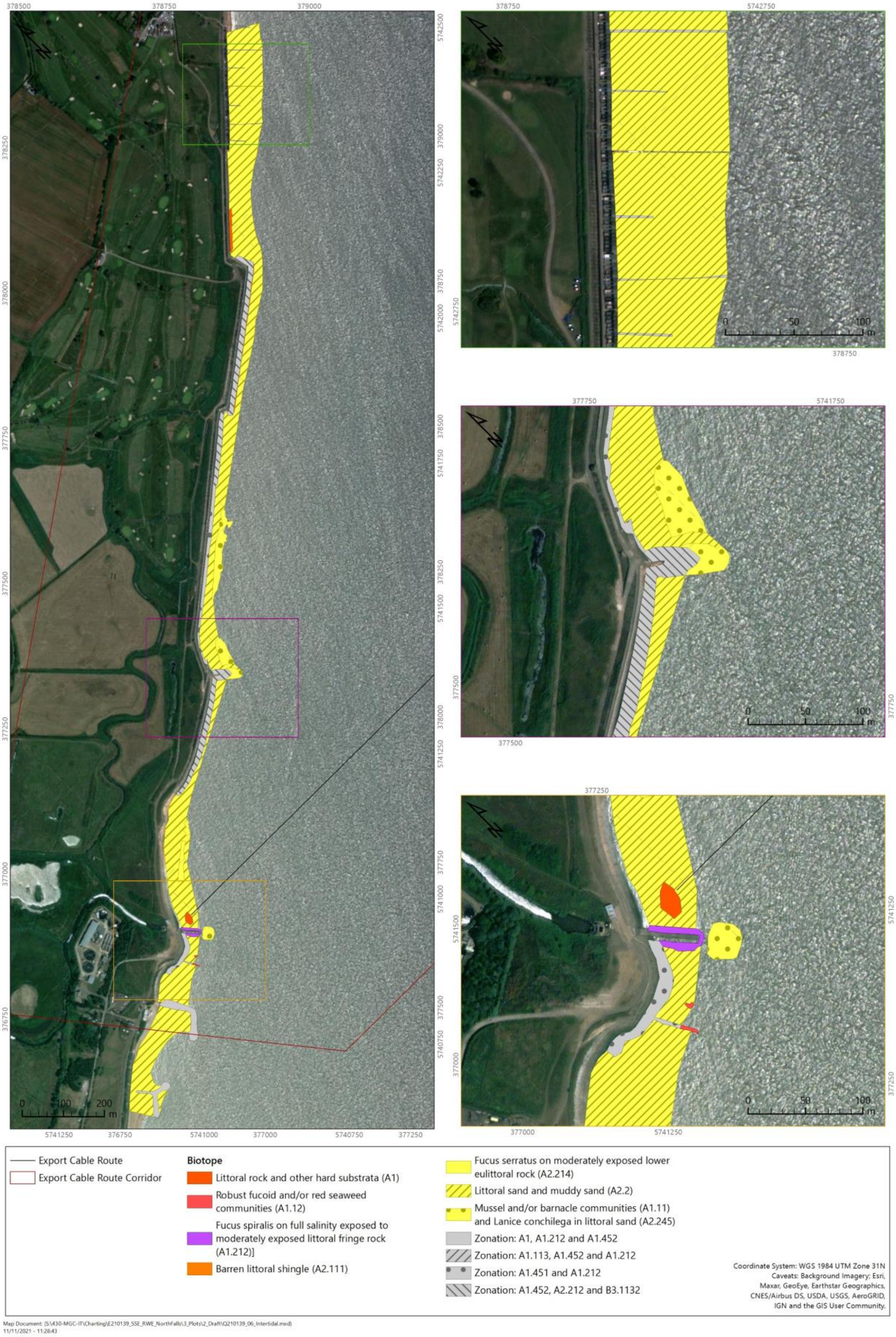


Figure 4.30: Spatial distribution of intertidal habitats and biotopes, Five Estuaries Offshore Site Investigation

4.5.2 Export Cable Route

The physical and biological characteristics of the multivariate groups identified through the multivariate analysis of data from stations along the ECR (Section 4.4.3.3) were evaluated in conjunction with the results of the video and photographic analysis, detailed in the Environmental Features Report (Fugro 2022a), to provide a comprehensive habitat assessment. The seabed video provides an overview of the seabed over a wider area and can identify isolated features such as cobbles and/or boulders. By comparison, grab sampling provides detailed information of the sediment composition and associated fauna at a single point source and is essential for the biotope classification of sedimentary habitats. The average similarity of the multivariate groups ranged from 13.0 % to 44.0 %, therefore, the stations within each multivariate group were assessed also individually when deriving biotopes, which often resulted in a combination of biotopes characterising each multivariate group.

Results of the seabed video indicated the presence of the following biotopes and biotope complexes:

- 'Piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231) described as soft chalk or clay in moderately exposed tide-swept conditions, bored by bivalves (EEA, 2019).
  This biotope was assigned to areas of firm clay, amongst areas of mixed sediments, recorded at stations FE4_01, FE4_02 and FE4_03. These firm clay sediments featured round burrows characteristic of piddocks and supported little or no epifauna. Mobile epifauna included the starfish *Asterias rubens*, hermit crabs of the family Paguridae and brittlestars of the class Ophiuroidea including *Ophiura albida*.
- 'Infralittoral mixed sediment' (A5.43), described as heterogeneous sediments in fully (or near fully) marine conditions, supporting various animal-dominated communities, with relatively low proportions of seaweeds (EEA, 2019).
  This biotope complex was assigned to areas of mixed sediments at stations FE7b_03, FE7d_02a and FE7f_02a along the nearshore sections of the ECR at depths of< 20 m BSL. There was poor underwater visibility at the time of the survey and identifiable fauna included *Flustra foliacea*, *Alcyonium digitatum* and turfs of Hydrozoa/Bryozoa.
- 'Circalittoral mixed sediment' (A5.44), described as heterogeneous sediment in the circalittoral zone (generally below 15 m to 20 m) featuring mixed sediments including shells, cobbles and pebbles embedded in or lying upon mud, sand or gravel; the variable nature of the seabed results in a diverse variety of biological communities (EEA, 2019).
  This biotope complex was assigned to areas of mixed sediments along the offshore sections of the ECR, including stations FE4_01, FE4_02, FE4_03 where it occurred in conjunction with 'Piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231). 'Circalittoral mixed sediment' (A5.44) was also assigned to stations FE4_05 and FE4_08, where it occurred in conjunction with '*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment' (A5.445) and station

FE5_01. Epibiota comprised Ophiuroidea, including *O. fragilis*, *A. rubens*, the sea urchin *Psammechinus miliaris*, anemones of the order Actiniaria including species of the genus *Urticina* and the family Sagartiidae, the queen scallop *Aequipecten opercularis*, turfs of Hydrozoa/Bryozoa and polychaetes tubes of the family Serpulidae, including species of the genus *Spirobranchus*.

- '*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment' (A5.445), described as dense beds of brittlestars (mainly *O. fragilis* and *Ophiocomina nigra*) on circalittoral sediment (EEA, 2019).
  This biotope was assigned to stations FE4_05 and FE5_09, which features mixed sediments and dense aggregations of *O. fragilis*. Other taxa included turfs of Hydrozoa/Bryozoa, *P. miliaris*, *A. digitatum*, *A. rubens* and species of *Urticina* and Sagartiidae.
- '*Sabellaria spinulosa* on stable circalittoral mixed sediment' (A5.611), described as high abundances of *S. spinulosa*, forming loose agglomerations of tubes on mixed sediment, which result in a low-lying matrix of sand, gravel, mud and tubes on the seabed (EEA, 2019). This biotope was assigned to station FE4_04, featuring mixed sediments and epibiota comprising *S. spinulosa*, turfs of Hydrozoa/Bryozoa, *P. miliaris*, *A. digitatum*, *A. rubens* and species of *Urticina* and Sagartiidae.

Owing to the presence of *S. spinulosa* tube aggregations, four transects were further assessed in relation to the Annex I habitat 'Reef' (biogenic). Similarly, owing to the presence of cobbles and occasional boulders, five stations were assessed in relation to the Annex I habitat 'Reef' (geogenic).

The results of the assessments, detailed in the Environmental Feature Report (Fugro, 2022a), are summarised in Table 4.27 for the *S. spinulosa* reef and Table 4.28 for the stony reef. Figure 4.31 presents photos representative of areas assessed for potential biogenic and geogenic reef.

All *S. spinulosa* aggregations were classified as 'Not a reef' owing to an elevation of 2 cm or less even in areas with a percentage cover higher than 30 % (Table 4.27).

Areas of 'Low' resemblance to a stony reef were recorded along transect FE4_01, FE4_04, FE4_03 (Table 4.27).

Table 4.27: Summary of '*Sabellaria spinulosa*' assessment, Five Estuaries Offshore Site Investigation

Station	Length* [m]	Elevation [cm]	Patchiness [% cover]	Overall assessment
FE4_04	3	< 2	> 30	Not a reef
	36	< 2	> 30	Not a reef
FE7b_02	2	< 2	< 10	Not a reef
	12	< 2	< 10	Not a reef
	10	< 2	10 – 20	Not a reef
	4	2	20 – 30	Not a reef

Station	Length* [m]	Elevation [cm]	Patchiness [% cover]	Overall assessment
FE7d_02a	2	< 2	< 10	Not a reef
FE7f_02a	1	< 2	< 10	Not a reef
	11	< 2	< 10	Not a reef
Notes * Refers to section of transect assessed				

Table 4.28: Summary of 'Stony reef' assessment, Five Estuaries Offshore Site Investigation

Station	Length* [m]	% Cover Cobbles and Boulders	Elevation	Epifaunal Coverage	Resemblance to a Stony Reef
FE4_01	35	10 – 40	64 mm – 5 m	< 80 %	Low
FE4_02	50	< 10	< 64 mm	< 80 %	Not a Reef
FE4_03	14	< 10	< 64 mm	< 80 %	Not a reef
	20	10 – 40	64 mm – 5 m	< 80 %	Low
	17	10 – 40	< 64 mm	< 80 %	Low
	22	10 – 40	64 mm – 5 m	< 80 %	Low
FE4_04	53	10 – 40	< 64 mm	< 80 %	Low
Notes * Refers to section of transect assessed					

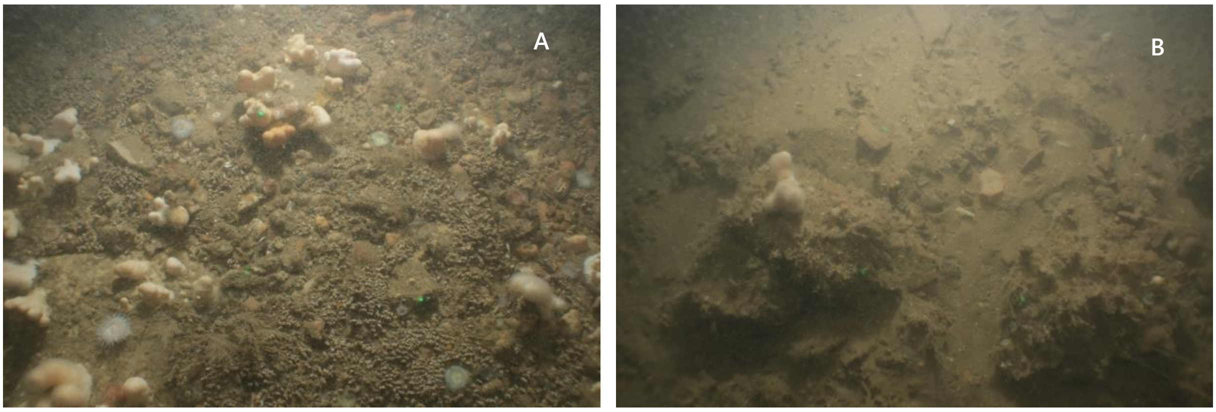


Figure 4.31: Representative photos of (A) *Sabellaria spinulosa* and (B) stony habitats assessed for potential Annex I 'Reef', Five Estuaries Offshore Site Investigation

4.5.2.1 Biotope Classification

Table 4.29 presents the EUNIS hierarchical structure of the habitats and biotopes identified along the ECR, by integration of the grab samples with the video and photographic data. Reference was also made to the European Marine Observation Data Network (EMODnet) seabed habitat distribution map (EMODnet, 2022) to verify alignment and/or highlight difference with the available data.

Table 4.30 presents the biotopes identified for each of the multivariate groups (detailed in Section 4.4.3.3).

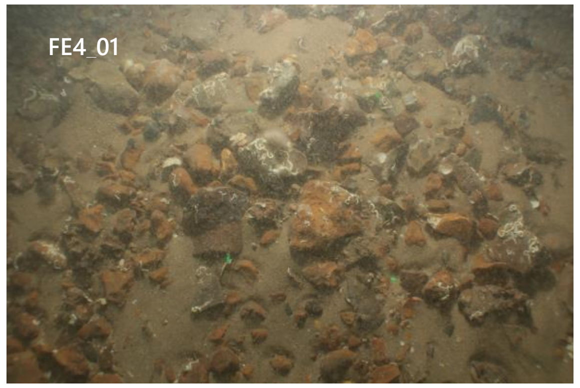
Table 4.29: Habitat classifications, Five Estuaries Offshore Site Investigation

EUNIS Habitat Classification (EEA, 2019)					Equivalent JNCC (2015) Classification
Environment Level 1	Habitat Complex Level 2	Habitat Level 3	Biotope Complex Level 4	Biotope Level 5	
A Marine	A5 Sublittoral sediment	A5.1 Sublittoral coarse sediment	A5.13 Infralittoral coarse sediment	A5.135 *Glycera lapidum* in impoverished infralittoral mobile gravel and sand	SS.SCS.ICS.Glap *Glycera lapidum* in impoverished infralittoral mobile gravel and sand
			A5.14 Circalittoral coarse sediment	-	SS.SCS.CCS Circalittoral coarse sediment
		A5.2 Sublittoral sand	A5.26 Circalittoral muddy sand	A5.261 *Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment	SS.SSA.CMuSa.AalbNuc *Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment
		A5.4 Sublittoral mixed sediments	A5.44 Circalittoral mixed sediment	-	SS.SMX.CMx Circalittoral mixed sediment
			A5.45 Deep circalittoral mixed sediments	A5.451 Polychaete-rich deep *Venus* community in offshore mixed sediments	SS.SMX.OMx.PoVen Polychaete-rich deep *Venus* community in offshore mixed sediments

Notes
EEA = European Environment Agency
EUNIS = European Nature Information System
JNCC = Joint Nature Conservation Committee

Table 4.30: Characteristics of EUNIS habitats identified from the grab samples, Five Estuaries Offshore Site Investigation

EUNIS Habitat Classification (EEA, 2019)	Multivariate Faunal Group	Sediment description and Depth	Epibiota (from video and photographs)	Characterising Taxa (from grab samples)		Representative photograph from video analysis
				Infaunal	Epifaunal	
Circalittoral coarse sediment (A5.14) Circalittoral mixed sediment (A5.44)	A (FE7e_03, FE7f_01)	Poorly sorted sandy gravel 10. m to 10.5 m BSL	* Hydrozoa/Bryozoa turfs ?*Vesicularia spinosa*	*Magelona johnstoni*	-	-
Circalittoral coarse sediment (A5.14) Circalittoral mixed sediment (A5.44)	B (FE4_07, FE6_09, FE6_10)	Very poorly sorted sandy gravel 20 m to 28 m BSL	-	*Spiophanes bombyx* (agg.) *Ophelia borealis* *Nephtys cirrosa*	*Aspidelectra melolontha* *Conopeum reticulum*	-
Circalittoral coarse sediment (A5.14)	C (FE4_06, FE6_06, FE6_07, FE6_08)	Poorly sorted gravelly sand 17 m to 22 m	-	*Notomastus* *Hesionura elongata* Nemertea *Pisione remota* *Glycera lapidum*	*Escharella immersa* Folliculinidae	-
Circalittoral muddy sand (A5.26)	D (FE7c_04, FE7e_02, FE7g_02, FE7g_03)	Poorly sorted muddy sand 11 m to 16 m	-	*Nucula nitidosa* *Nephtys hombergii* *Diastylis bradyi* *Modiolula phaseolina* *Lagis koreni* *Ampharete lindstroemi*	Folliculinidae	-
Circalittoral mixed sediment (A5.44) Polychaete-rich deep *Venus* community in offshore mixed sediments (A5.451)	E1 (FE5_01, FE6_11)	Very poorly sorted gravelly muddy sand 23 m to 29 m	Poor visibility, seabed not visible	*Lagis koreni* *Kurtiella bidentata* *Ophiura albida* *Pholoe inornata* *Eunereis longissima* *Sabellaria spinulosa* Nemertea	*Conopeum reticulum* *Aspidelectra melolontha*	-
Abra alba and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment (A5.261)	E2 (FE7b_02, FE7b_04)	Very poorly sorted gravelly sandy mud 8 m to 9 m BSL	* Hydrozoa/Bryozoa turfs *Sabellaria spinulosa* tubes	*Nucula nucleus* *Ampelisca diadema* *Haploops* *Musculus discors* *Nephtys kersivalensis* *Abra alba* *Amphipholis squamata* *Lepidonotus squamatus* *Pholoe inornata* *Hilbigneris pleijeli*	*Conopeum reticulum* *Electra monostachys* *Aspidelectra melolontha*	-
Circalittoral coarse sediment (A5.14) Polychaete-rich deep *Venus* community in offshore mixed sediments (A5.451)	E3 (FE5_05, FE5_07, FE6_02)	Very poorly sorted sandy muddy gravel 15 m to 40 m BSL	-	*Lumbrineris cf. cingulata* *Sabellaria spinulosa* *Caulleriella alata* Nemertea *Spirobranchus lamarcki* *Aonides paucibranchiata* *Laonice irinae* *Verruca stroemia* *Amphipholis squamata* *Chaetozone zetlandica*	*Schizomavella* *Escharella immersa*	-

EUNIS Habitat Classification (EEA, 2019)	Multivariate Faunal Group	Sediment description and Depth	Epibiota (from video and photographs)	Characterising Taxa (from grab samples)		Representative photograph from video analysis
				Infaunal	Epifaunal	
Glycera lapidum in impoverished infralittoral mobile gravel and sand (A5.135)	E4 ▽ (FE6_04, FE7d_03, FE7g_01)	Very poorly sorted sandy gravel 9 m to 17 m BSL	* *Flustra foliacea*	*Sabellaria spinulosa* *Lumbrineris* cf. *cingulata* Ascidiacea *Lagis koreni* *Sthenelais boa* *Glycera lapidum* *Pseudopolydora pulchra* Actiniaria *Pholoe inornata* *Praxillella affinis*	*Aspidelectra melolontha* *Electra monostachys* *Electra pilosa* *Conopeum reticulum* *Escharella immersa* *Schizomavella*	-
Polychaete-rich deep *Venus* community in offshore mixed sediments (A5.451)	E5 ● (FE4_01, FE4_02, FE4_03, FE4_04, FE4_05)	Extremely poorly sorted muddy sandy gravel 25 m to 29 m BSL	*Alcyonium digitatum* *Asterias rubens* Sagartiidae *Spirobranchus* *Urticina* *Calliostoma granulatum* *Calliostoma zizyphinum* *Nemertesia antennina* *Ophiothrix fragilis* *Psammechinus miliaris*	*Pisidia longicornis* *Verruca stroemia* *Amphipholis squamata* *Spirobranchus lamarcki* *Phoronis* Nemertea *Dipolydora flava* *Pholoe inornata* *Lumbrineris* cf. *cingulata* *Apseudes talpa*	*Chorizopora brongniarti* *Escharella immersa* *Reptadeonella violacea* *Schizomavella* *Tubuliporidae* *Alcyonium digitatum*	
Circalittoral mixed sediment (A5.44)	E6 ◇ (FE7b_05, FE7b_06, FE7c_01, FE7c_02, FE7c_03, FE7d_01, FE7e_01)	Extremely poorly sorted muddy sandy gravel 9 m to 12 m BSL	Poor visibility, seabed not visible	*Ampharete lindstroemi* *Notomastus* *Lumbrineris* cf. *cingulata* *Golfingia (Golfingia) elongata* *Phoronis* *Amphipholis squamata* *Dipolydora flava* Nemertea *Lagis koreni* *Pholoe inornata*	*Aspidelectra melolontha* *Schizomavella* *Escharella immersa* *Conopeum reticulum* *Electra pilosa* Folliculinidae	-
Circalittoral mixed sediment (A5.44) Polychaete-rich deep *Venus* community in offshore mixed sediments (A5.451)	E7 + (FE4_08, FE5_02, FE5_03, FE5_04, FE5_06, FE5_08, FE5_09, FE5_10, FE6_01)	Extremely poorly sorted mixed sediments 15 m to 40 m BSL	*Asterias rubens* *Scyliorhinus canicula* Serpulidae *Alcyonium digitatum* *Ophiothrix fragilis* *Spirobranchus*	*Lumbrineris cf. cingulata* *Notomastus* Nemertea *Aonides oxycephala* *Paucibranchia totospinata* *Leptochiton asellus* *Scalibregma inflatum* *Ampharete lindstroemi* *Ophiura albida* *Phoronis*	*Escharella immersa* *Schizomavella* *Alcyonium digitatum* *Disporella hispida* *Sertulariidae* Porifera Tubuliporidae	

EUNIS Habitat Classification (EEA, 2019)	Multivariate Faunal Group	Sediment description and Depth	Epibiota (from video and photographs)	Characterising Taxa (from grab samples)		Representative photograph from video analysis
				Infaunal	Epifaunal	

Notes
*= Low underwater visibility
Multivariate groups identified by hierarchical clustering analysis of enumerated fauna
Sediment classification based on Folk (British Geological Survey (BGS) modified), description based on Wentworth (1922) scale
Characterising taxa from grab samples are the top ten identified through the similarity percentage analysis (SIMPER)
Epifauna from the grab samples lists the most frequently occurring taxa in the multivariate group
BSL = Below sea level
EUNIS = European Nature Information System

4.5.2.2 ‘*Glycera lapidum* in impoverished infralittoral mobile gravel and sand’ (A5.135)

The biotope ‘*Glycera lapidum* in impoverished infralittoral mobile gravel and sand’ (A5.135) is described as mixed slightly gravelly sands in the infralittoral on exposed open coasts, hosting impoverished communities characterised by the polychaete *Glycera lapidum* (agg.) and other species such as *S. bombyx* and *Nephtys* spp. (EEA, 2019).

This biotope was assigned to all stations in multivariate group E4. These stations were characterised by very poorly sorted sandy gravel, in water depth of 9 m to 17 m BSL. Faunal abundance was relatively high at these stations, owing mainly to the numerical dominance of ascidians, which were amongst the characterising taxa, along with *S. spinulosa, L.* cf. *cingulata*, *L. koreni*, *Sthenelais boa* and *G. lapidum*. The abundance of *S. spinulosa* in this group was between 3 and 36 individuals per station.

Colonial epifauna was represented by bryozoans such as *A. melolontha*, *E. monostachys*, *E. pilosa*, *C. reticulum*, *E. immersa* and species of *Schizomavella*, in addition to *Flustra foliacea* that was recorded through the seabed video and photography.

4.5.2.3 ‘Circalittoral coarse sediment’ (A5.14)

The biotope complex ‘Circalittoral coarse sediment’ (A5.14) is described as coarse sands, gravel and shingle in the circalittoral zone along exposed coasts and offshore. This habitat is characterised by robust infaunal polychaetes, mobile crustacea and bivalves (EEA, 2019).

This biotope complex was assigned to seven stations, including the 4 stations in group C, two stations in group B and one in group A. These stations were characterised by gravel and sand with little (≤ 1.69 %) mud content, in water depth of 10 m to 22 m BSL. Faunal richness and diversity were generally low and represented by polychaetes, such as *Notomastus*, *P. remota*, *H. elongata*, *G. lapidum*, *S. bombyx* (agg.) and *G. oxycephala*.

Colonial epifauna was represented by bryozoans notably *E. pilosa*, *A. melolontha*, *Scruparia ambigua*, *C. reticulum*, *Chorizopora brongniarti* and *E. immersa*, as well as Folliculinidae.

4.5.2.4 ‘Circalittoral muddy sand’ (A5.26)

The biotope complex ‘Circalittoral muddy sand’ (A5.26), is described as non-cohesive muddy sands in the circalittoral zone hosting polychaetes, bivalves such as *A. alba* and *N. nitidosa*, echinoderms of the genera *Amphiura* and *Ophiura* and *Astropecten irregularis* (EEA, 2019).

This biotope complex was assigned to the four stations in group D, characterised by muddy sand and/or sandy mud, with little (≤ 0.45 %) or no gravel content, in water depth of 1 m to 16 m BSL. Faunal richness and diversity were generally low and represented by bivalves, such as *N. nitidosa* and *M. phaseolina*, the cumacean *D. bradyi* and the polychaetes *N. hombergii*, *L. koreni* and *A. lindstroemi*.

Colonial epifauna, where present, was represented by Folliculinidae.

4.5.2.5 ‘*Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment’ (A5.261)

The biotope ‘*Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment’ (A5.261), is described as non-cohesive muddy sands or slightly shelly/gravelly muddy sand characterised by the bivalves *A. alba* and *N. nitidosa*. Other important taxa include species of *Nephtys* and *Chaetozone* and *S. bombyx*. The echinoderms *O. albida* and *A. rubens* may also be present (EEA, 2019).

This biotope was assigned to the stations in group E2, by gravelly and/or sandy mud, in water depth < 10 m BSL. The bivalves *N. nucleus* and *A. alba* were the characterising taxa along with the amphipods *Ampelisca diadema* and *Haploops* and the polychaete *Nephtys kersivalensis*. The mussel *M. discors* was also recorded in this group, with station FE7b_02 comprising 1376 individuals, which was the highest abundance of any invertebrates at any one station along the ECR.

Colonial epifauna was represented by the bryozoans *C. reticulum*, *E. monostachys* and *A. melolontha*. Tubes of *S. spinulosa* were recorded at station FE7b_02 through the seabed video.

4.5.2.6 Circalittoral mixed sediment (A5.44)

The biotope complex ‘Circalittoral mixed sediment’ (A5.44) is described as heterogeneous sediment in the circalittoral zone featuring mixed sediments including shells, cobbles and pebbles embedded in or lying upon mud, sand or gravel; the variable nature of the seabed results in a diverse variety of biological communities (EEA, 2019).

This biotope complex was assigned to 13 stations, including the seven stations in group E6, two stations in group E3, and single stations in groups A, B, E1 and E7. These stations were characterised by mixed sediments, with a gravel content of 11.73 % to 82.14 % and a mud content of 4.50 % to 44.35 %, in water depth of 9 m to 28 m BSL. Faunal richness and diversity were generally higher than those of the coarse or muddy sediment habitats and represented by Nemertea, polychaetes including *L.* cf. *cingulata*, *S. spinulosa*, *L. koreni*, *A. lindstroemi*, *P. inornata*, *D. flava* and species of *Notomastus*. The echinoderm *A. squamata* and horseshoe worms of the genus *Phoronis* also typified these habitats.

Colonial epifauna, where present, was represented by bryozoans, typically, *A. melolontha*, *Schizomavella*, *C. reticulum*, *E. immersa* and *E. pilosa*.

4.5.2.7 ‘Polychaete-rich deep *Venus* community in offshore mixed sediments (A5.451)

The biotope ‘Polychaete-rich deep *Venus* community in offshore mixed sediments’ (A5.451), is described as a community rich in polychaetes and venerid bivalves. Typical polychaetes include, but are not limited to, *G. lapidum*, *A. paucibranchiata*, *M. fragilis*, *Lumbrineris* and syllid species and bivalves such as *Aonides oxycephala* and *Spisula elliptica* (EEA, 2019).

This biotope was assigned to 15 stations, including the five stations in group E5, eight stations in group E7 and single stations in groups E1 and E3. These stations were characterised by mixed sediments with a gravel content of 9.26 % to 59.95 % and a mud content of 8.53 % to 71.07 %, in water depth of 25 m to 40 m BSL. Faunal richness and diversity were on average the highest recorded and represented by polychaetes (e.g. *L.* cf. *cingulata*, *Notomastus*, *S. inflatum*, *S. lamarcki*, *A. oxycephala*, *S. spinulosa* and *G. lapidum*), molluscs (e.g. *A. alba*, *K. bidentata*, *A. opercularis*, *Sphenia binghami*, *N. nucleus*, *D. rotundata* and *T. ovata*), arthropods (e.g. *V. stroemia*, *A. spinipes*, *Ericthonius*, *P. longicornis*) and echinoderms (e.g. *Amphipholis squamata*, *P. miliaris, O. albida*), along with Nemertea and *Phoronis*.

Colonial epifauna, where present, included bryozoans (e.g. *E. immersa*, *D. hispida*, *C. brongniarti* and species of Tubuliporidae and *Schizomavella*), hydroids (e.g. *A. digitatum* and species of Sertulariidae and *Clytia*), species of Porifera and Folliculinidae. Several of the epifaunal taxa recorded by the grab samples were also recorded through seabed video and photography, along with *A. rubens*, species of *Urticina*, *Calliostoma granulatum*, *Calliostoma zizyphinum*, *Nemertesia antennina* and the fish *Scyliorhinus canicula*.

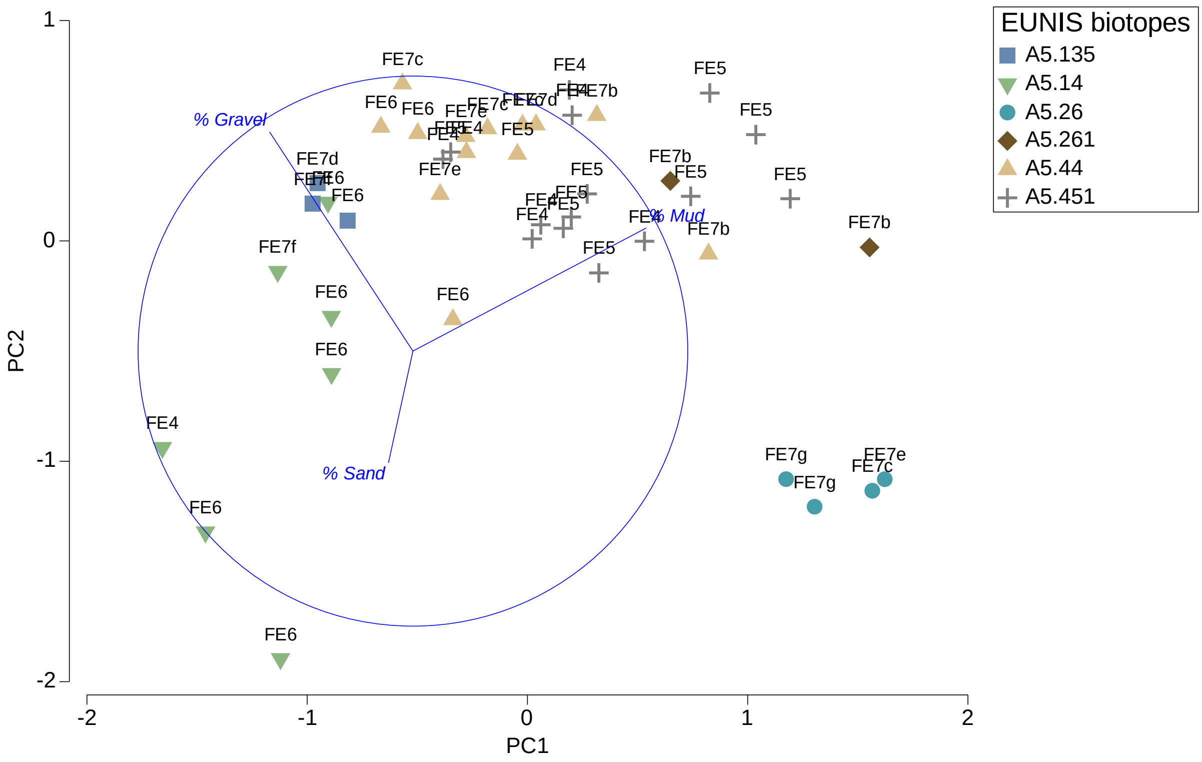
4.6 Biotope Classification and Sediment Data

Figure 4.32 illustrates the association between the biotopes recorded and the sediment type and Figure 4.33 illustrates the spatial distribution of biotopes along the ECR.

Mixed sediments were the predominant habitat along the ECR, with most stations being classified as ‘Circalittoral mixed sediment’ (A5.44) and ‘Polychaete-rich deep *Venus* community in offshore mixed sediments’ (A5.451).

The biotope complex ‘Circalittoral coarse sediment’ (A5.14) classified stations in the central section of the ECR, giving way to the biotope ‘*Glycera lapidum* in impoverished infralittoral mobile gravel and sand’ (A5.135), as the diversity of the sediment increased with small percentages of mud.

Stations along the nearshore section of the ECR were classified as ‘Circalittoral muddy sand’ (A5.26) and ‘*Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment’ (A5.261).



Notes:
EUNIS = European Nature Information System
PC = Principal component
A5.135 = *Glycera lapidum* in impoverished infralittoral mobile gravel and sand
A5.14 = Circalittoral coarse sediment
A5.26 = Circalittoral muddy sand
A5.261 = *Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment
A5.44 = Circalittoral mixed sediment
A5.451 = Polychaete-rich deep *Venus* community in offshore mixed sediments

Figure 4.32: 2D PCA of sediment composition with superimposed survey block and EUNIS biotopes, export cable route, Five Estuaries Offshore Site Investigation

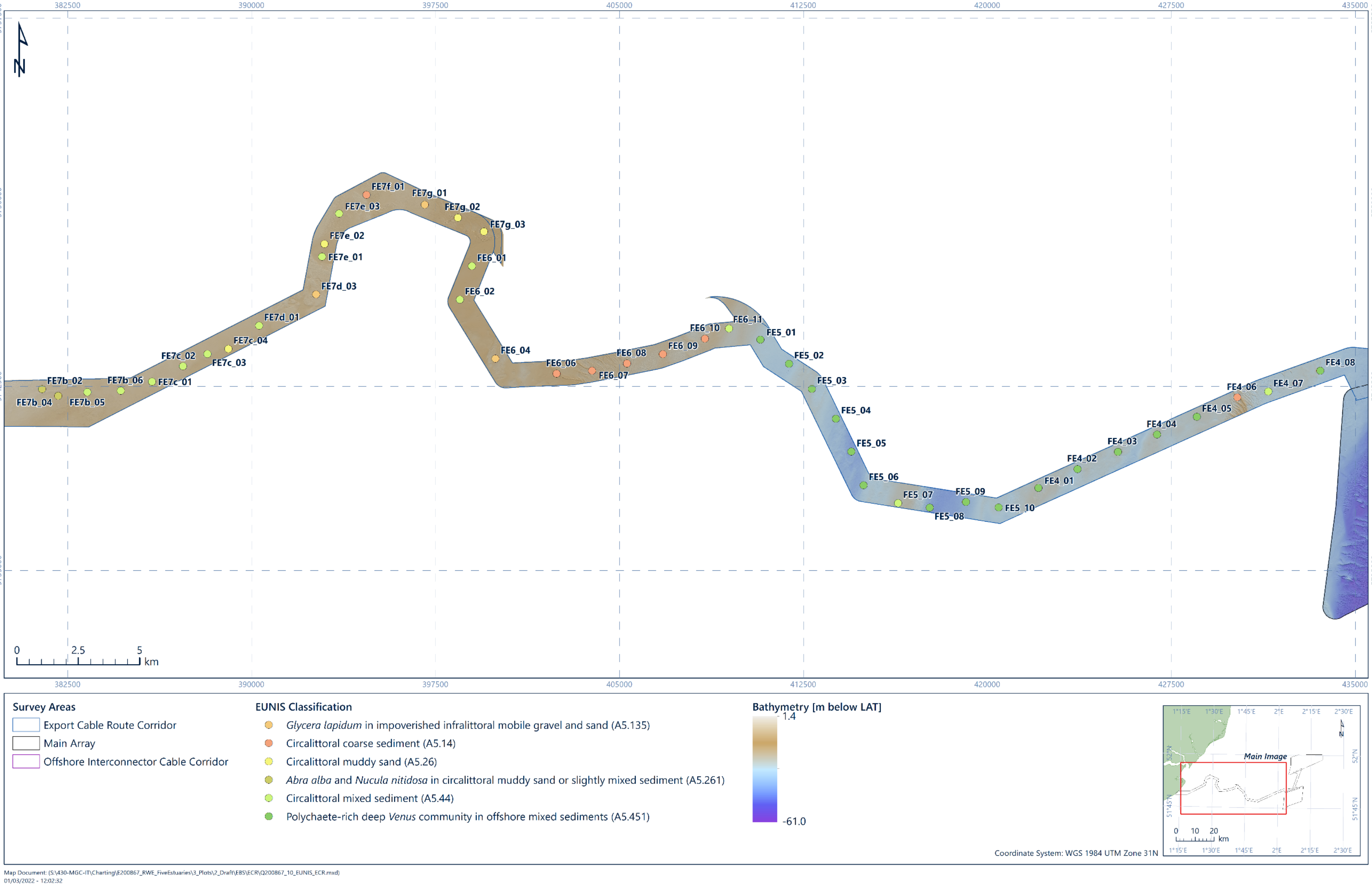


Figure 4.33: Spatial distribution of EUNIS habitats and biotopes, export cable route, Five Estuaries Offshore Site Investigation

5. Discussion

Physico-chemical and biological analysis of sediment samples provided information for sediment characterisation, potential contamination and biological communities across the intertidal survey area and along the ECR. Data gathered are important components of environmental studies to support engineering design and/or EIA.

5.1 Sediment Characterisation

5.1.1 Intertidal

Sediments across the intertidal survey comprised sand and gravel, the latter accounting for higher percentages at high water and mid water stations compared to low water stations. Fines were absent from the intertidal survey area, most likely owing to the exposure of the intertidal survey area and the local hydrodynamics which would prevent the deposition of the finer sediment.

The coarseness of the sediment ranged from ‘medium sand’ to ‘pebble’, based on the Wentworth (1922) scale. Of these, ‘medium sand’ and ‘coarse sand’ typified most of the stations sampled, whereas the sediment at the remaining stations was described as ‘very coarse sand’, ‘granule’ and ‘pebble’.

Using the Folk (BGS modified) classification, three sediment classes were identified, including ‘sand’, ‘gravelly sand’ and ‘sandy gravel’. Of these ‘sand’ described most stations.

In general, the coarseness of the sediment decreased towards low water, where the sediment was less heterogeneous compared to that at high water. This was reflected in a decrease of the sediment sorting and sediment classes at low shore.

The results of the intertidal survey concur with the literature which reports the sedimentary shores of east England to consist mostly of unconsolidated sediments, the coarseness of which range from coarse to fine sand depending on the degree of exposure and hydrodynamics (Eleftheriou et al., 2004), as well as their geological history (DTI, 2002). Several stations had bimodal or polymodal sediment particle size distribution, with the most frequently occurring peaks in the second and third mode falling within the ‘granule’ and/or ‘pebble’ regions.

Redox measurements indicated that the sediments across the intertidal survey area were oxygenated with values of redox potential of between +120 mV and 419 mV (temperature corrected). This was corroborated by the presence of an anoxic layer at depth > 10 cm. The visual assessment of the anoxic layer represents an integrated long-term average of redox conditions, compared to redox electrodes that measures the instantaneous redox potential of the sediment, which can be very dynamic (Gerwing et al., 2013). The redox environment of each zone of the marine sediments is determined by biogeochemical processes involved in the decomposition of the buried organic substances (Fisher and Böttcher, 2000) and properties of the sediment including its consolidations and hydraulic conductivity as well as local drainage (Davy et al., 2011). Each zone of the marine sediments extend from the oxic range near the surface of the sediment (values at about +350 mV to 450 mV) down to the deep anoxic/sulphide range (values at about −200 mV to −250 mV), with an intermediate suboxic or postoxic range (values of +100 mV to +200 mV) also frequently noticed (Fisher and Böttcher, 2000).

5.1.2 Export Cable Route

Results of the seabed video footage described the seabed along the ECR as sandy muddy gravel with varying proportions of cobbles and shell fragments. Areas of clay with piddock holes were also recorded as well as rippled sand areas, the latter being indicative of sediment disturbance associated with hydrodynamics. Large areas of rippled sand and un-cohesive cover comprising superficial sand and/or mud with various proportions of gravel are ubiquitous throughout much of the North Sea (DTI, 2002).

Results of the sediment PSD analysis indicated the presence of heterogeneous sediments, with mean gravel, sand and fines content of 37.25 %, 40.51 % and 22.24 %, respectively. Gravel was recorded at all stations, whereas fines were absent from three stations. The coarseness of the sediment ranged from 'fine silt' to 'pebbles', with a median in the 'coarse sand' region, based on the Wentworth (1922) scale.

Ten sediment classes were identified using the Folk (BGS modified) classification, including 'muddy, sandy gravel', which typified 14 stations, 'sandy gravel' which typified seven stations, 'gravelly mud' and 'gravelly muddy sand', each typifying five stations. The remaining stations were classified as 'gravelly sand', 'muddy gravelly' and 'muddy sand' each typifying three stations, 'sandy mud' typifying two stations, and 'gravel' and 'sand' each typifying one station. The sorting coefficient reflected the heterogeneity of the sediment and ranged from moderately well sorted to extremely poorly sorted, with most stations having very poorly sorted sediments.

The sediments recorded along the ECR are typical of the southern North Sea, which is reported to comprise of a mix of sand and gravel (Jones et al., 2005), often forming a thin veneer overlaying clay bedrock particularly in the Outer Thames Estuary (Marine Aggregate Levy Sustainability Fund [MALSF], 2009). In this study, areas of firm clay were recorded through the seabed video and photography at stations in block FE4. Variations in the proportions of mud in the Outer Thames Estuary are reported to be associated with the input from the local fluvial sources and differences in depositional and erosion regimes, whereas well sorted mobile sand is associated with the tidally aligned sandbanks, notably the Inner Gabbard, Greater Gabbard, Galloper and North Falls (MALSF, 2009). Pebble, cobble and boulder size classes of seabed gravel are localised and likely originate from older gravelly formations that have been submerged during rising sea level (DTI, 2002).

Continuous inputs of fines from the estuaries and sediment disturbance associated with hydrodynamics, results in patchy distribution of sediment assemblages (Irving, 1998). Mixed sediments with varying proportions of gravel, sand and fines, occurred along the ECR. Shell fragments, recorded through in situ observation of the grab samples, are a feature of seabed sediment of this region (MALSF, 2009). This is of relevance as the PSD analysis does not discern between gravel and shells. The different sources of sediment input may result in multimodal distribution of the sediment particle size (Hein, 2007), in line with the results of this study which recorded bimodal and/or polymodal distribution at 38 of the 44 stations sampled.

5.2 Sediment Chemistry

5.2.1 Sediment Hydrocarbons

5.2.1.1 Total Hydrocarbons

Across the intertidal survey area THC ranged from < 1 mg/kg to 3.16 mg/kg. Along the ECR, THC was below the LOD at stations along the offshore section, whereas at stations along the nearshore section, THC was between 8.24 mg/kg and 10.3 mg/kg, all values being below the Cefas AL1 (100 mg/kg) (Cefas, 2020). It is worth noting that the Cefas AL1 for THC is currently used as guideline in the absence of full data for PAHs to assess whether dredged material can be disposed of to sea by the regulators and their scientific advisors (Mason et al., 2020). The use of THC is limited in that it provides no indication of toxicity and may be conservative as indicated by most sediment failing this threshold, in addition there is large inter-laboratory method variability (Mason et al., 2020). Overall, results from this study are indicative of relatively low anthropogenic input, as in general, marine sediments are considered unpolluted if the THC is below 10 μg/g (Farrington & Tripp, 1977; Volkman et al., 1992; Readman et al., 2002).

5.2.1.2 Aromatic Hydrocarbons

Monitoring of aromatic hydrocarbon type and content is important due to the particularly toxic nature (mutagenic/carcinogenic) of several PAHs, particularly the heavier weight PAHs. The Unites States Environmental Protection Agency (US EPA) has identified 16 priority PAHs to be monitored (Keith, 2015) and the CEMP specifies 9 PAHs of specific concern (OSPAR, 2014), which primarily reflect inputs from man-made combustion sources.

The PAH concentrations across the intertidal survey area and along the ECR were below the marine SQGs and are therefore not considered to be detrimental to the marine environment. A spatial pattern of distribution was identified, with stations along the nearshore section of the ECR having a higher concentration of PAHs compared to the offshore section.

Regional contextualisation of the results indicated that the total concentration of the 22 PAHs analysed was higher than the range of 0.3 μg/kg to 26.3 μg/kg reported for station CSEMP 475 in the Outer Gabbard area (Cefas, 2012). These differences are likely to be associated with location and sedimentary differences, as the sediment at the offshore station CSEMP 475 is reported to be slightly gravelly sand with mud content < 1 % (Cefas, 2012), compared to a mean mud content of 22.24 % along the ECR with peaks of up to 84.15 %.

5.2.2 Sediment Metals

Metal concentrations in sediment samples across the intertidal area were below the marine SQGs for all metals analysed. Along the ECR arsenic and nickel were above the Cefas AL1 at four stations, with station FE4_02_50 m having arsenic and nickel concentrations also above their respective ERM value. Concentrations of nickel above the ERM value were recorded also at stations FE5_09 and FE7b_04. The concentration of arsenic was above the Canadian TEL at all stations. It is worth noting that the value of the Canadian TEL for arsenic (7.24 mg/kg) is lower than that of the NOAA ERL (8.2 mg/kg), which has been considered too low (de Mora et al., 2004) particularly as uncontaminated coastal sediments are generally reported to have arsenic concentrations between 5 mg/kg and 15 mg/kg (Neff, 1997). Importantly, the NOAA ERLs for arsenic and nickel have not been adopted for the assessment of contamination status in the OSPAR maritime area, as they are below the BAC (OSPAR, 2009).

Natural sources of arsenic and nickel in the marine environment include mineral erosion, volcanic eruptions and forest fires (Neff, 1997; Cempel & Nikel, 2006), whereas anthropogenic sources include mining and smelting, burning of fossil fuel and surface runoff (Neff, 1997; Nriagu, 1990). High arsenic concentrations in the Outer Thames Estuary may be associated with a history of arsenical waste disposal in the Thames Estuary (Whalley et al., 1999). The arsenic concentrations recorded in this study along the ECR (9.7 mg/kg to 73.3 mg/kg) were within the range of < 0.15 mg/kg to 135 mg/kg reported for the southern North Sea (Whalley et al., 1999). Trends of nickel concentrations for the Inner Thames Estuary have been reported to match those of local sewage works' treatment discharge records, with values of 11 mg/kg to 113 mg/kg (Vane et al., 2020), which encompass the range recorded in this study along the ECR (9.4 mg/kg to 58.2 mg/kg).

Concentrations above the Cefas AL1 were recorded for cadmium at station FE4_05 and chromium at station FE5_09. The main sources of cadmium in the marine environment are emissions from combustion processes primarily in power plants and industry, as well as commercial and domestic sources, with other relevant sources including the metallurgical industry, road transport and wastes (OSPAR, 2013). Chromium enters the marine environment as result of mineral weathering and through riverine and atmospheric input (Geisler & Schmidt, 1991). Industrially, chromium is used for manufacturing steel and alloys, and it is found in rust and corrosion inhibitors, textiles and toner for photocopiers (Rifkin et al., 2004) as well as in drilling muds as chrome lignosulfonate, before its use was phased out (Department of Trade and Industry [DTI], 2001).

Similarly to nickel, trends of cadmium and chromium concentrations for the Inner Thames Estuary have been reported to match those of local sewage works' waste discharge, with values of cadmium between 0.2 mg/kg and 53 mg/kg and values of chromium between 14 mg/kg and 351 mg/kg (Vane et al., 2020). Both ranges encompass those reported in this study for cadmium (0.09 mg/kg to 0.50 mg/kg) and chromium (12.1 mg/kg to 42.9 mg/kg), along the ECR.

Concentrations above the Canadian TEL were recorded for copper at stations FE5_09 and FE7b_04. Sources of copper in the North Sea include copper plating and brass propellers, as well as antifouling paints, but also run-off from agricultural soils and roads. Concentrations of copper in marine sediments of the North Sea are reported above background concentrations in coastal areas and long major shipping lanes (OSPAR, 2016), the outer Thames Estuary being subject to notable commercial traffic (MALSF, 2009).

5.2.3 Sediment Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are industrial chemicals used in electrical equipment. Although the use of PCBs has been banned for many years, they can persist in marine sediments owing to their resistance to degradation (Geyer et al., 1984).

The PCBs analysed in this study had concentrations below their respective LODs except for selected congeners at stations along the nearshore section of the ECR. However, the total concentration of all PCBs was below the Cefas marine SQGs.

5.2.4 Sediment Organotins

Organotin compounds have historically been used in marine antifouling products however, their use is now prohibited, following evidence of their toxicity to selected marine organisms. However, TBT, one of the most toxic contaminants, may still enter the marine environment through sources such as wastewater, as TBT is used as biocide in preserving wood, textile, papers and stonework (Díez et al., 2005). Amongst the toxic effects of TBT is imposex, that is the imposition of male characteristics on the female gastropod *Nucella lapillus*, following exposure to concentration levels as low as 1 ng/L, with severe cases resulting in sterilisation of the organisms (Bryan et al., 1987).

The TBT degradation in sediments results in the production of DBT and monobutyl tin. These are used as stabilisers in polyvinyl chloride (PVC) production (Díez et al., 2005) and, although found to be less toxic than their parent compound, cause toxicity to some aquatic organisms (Huang et al., 2004).

The organotin compounds analysed in this study, specifically DBT and TBT, had concentrations below their respective LODs and below Cefas ALs across the intertidal survey area and along the ECR.

5.2.5 Sediment Organochlorine Pesticides

Organochlorine pesticides (OCPs) are synthesised pesticides used in agriculture as insecticides and have a long-term residual effect in the environment.

The OCPs analysed in this study included alpha-hexachlorocyclohexane (AHCH), beta-hexachlorocyclohexane (BHCH), gamma-hexachlorocyclohexane (GHCH), dieldrin, hexachlorobenzene (HCB), p,p'-dichlorodiphenyldichloroethylene (PPTDE), p,p' dichlorodiphenyltrichloroethane (PPDDT) and p,p'-dichlorodiphenyldichloroethane (PPDDE).

All OCPs across the intertidal survey area had concentrations below their respective LOD. Along the ECR, dieldrin, PPTDE and PPDDE were above their respective LOD at station FE7b_02; PPTDE was above the LOD also at station FE7c_04, whereas PPDDE was above the LOD also at stations FE7b_04 and FE7c_04. All values were below the Cefas marine SQGs, which currently include AL1 values for dieldrin and DDT.

5.3 Macrofaunal Communities

5.3.1 Intertidal

The intertidal communities from the core samples had low richness and diversity as indicated by the Shannon-Wiener index of diversity which ranged from 0.31 to 2.78, corresponding to bad and moderate diversity, respectively, according to the criteria outlined in Dauvin et al. (2012). The mean diversity was 1.34 and the median 1.00., which indicate poor diversity (Dauvin et al., 2012).

The biotic communities of littoral sediments are determined by the degree of exposure to hydrodynamics, which in turn determines the sediment type. In general, intertidal communities are tolerant to some degree of drainage at low tide and variation in air temperature and reduced salinity, particularly in estuarine situations (JNCC, 2015). Very coarse sediments tend to support few macrofaunal species owing to their mobility and the high degree of drying at low tide. Finer sediments tend to be more stable and retain some water between high tides and therefore support a greater diversity of species. Medium and fine sand usually support a range of oligochaetes, polychaetes and burrowing crustaceans (JNCC, 2015). The intertidal survey area was characterised by coarse sediments, the coarseness of which ranged from ‘medium sand’ to ‘pebble’. The associated fauna was represented mainly by Nematoda and Platyhelminthes, and invertebrates that are typical of shallow estuarine and marine habitats, such as the polychaetes *P. fulgens* (Gaston et al, 1992) and *S. martinensis* (Lavesque et al., 2014), and crustaceans capable of withstand period of exposure such as *B. pelagica* (Budd & Curtis, 2007).

5.3.2 Export Cable Route

Macrofaunal communities recorded along the ECR were represented mainly by Annelida which dominated in terms of richness and abundance. Of the annelids, the polychaetes *Notomastus*, *L.* cf. *cingulata*, *S. spinulosa*, *A. lindstroemi* and *P. inornata* were the top five most frequently occurring annelids recorded across the survey area. Of these, *L.* cf. *cingulata*, *S. spinulosa*, *A. lindstroemi* were also amongst the top five most abundant annelids, along with *S. lamarcki* and *L. koreni*.

Mollusca were represented by bivalves such as *A. alba, K. bidentata*, *N. nucleus*, S. *binghami* and the chiton *L. asellus*, which were the top five most frequently recorded molluscs along the ECR. Of these, *A. alba, K. bidentata*, *N. nucleus* were also amongst the top five most abundant molluscs, along with *M. discors* and *N. nitidosa*. Both *M. discors* and *N. nitidosa* had restricted distribution, being recorded at three and four stations, respectively, with high abundances at stations FE7b_02 and FE7b_04, along the nearshore section of the ECR. Some of the bivalves recorded are opportunistic species, for example, bivalves of the genus *Abra* are reported to be capable of exploiting newly disturbed substratum through larval recruitment, secondary settlement of post metamorphosis juveniles and/or redistribution of adults (De-Bastos, 2016). Similarly, *K. bidentata* is reported to occur in association with burrows of brittlestars of the order Ophiuroidea (Gofas & Salas, 2008) which were also recorded in this study, particularly *O. albida* and *A. squamata*, which were amongst the most frequently and abundant echinoderms, along with *P. miliaris* and *E. pusillus*. The latter is reported to inhabit the interstices of gravelly substrata in area exposed to strong tidal currents (Rees et al., 2007), such that of the study area.

Overall, the macrobenthic communities recorded in this study are indicative of coarse sediment habitats subject to a degree of surface sediment disturbance, as indicated by the polychaete composition, notably *H. elongata* and species of *Glycera* (Künitzer et al., 1992; Heip and Craeymeersch, 1995) and the occurrence of crustaceans such as *A. spinipes* (Tillin, 2019). The latter was amongst the top five most abundant and frequently occurring arthropods, along with *A. diadema* and species of *Haploops* and *Ericthonius*. The presence of pebbles and cobbles, also recorded through the seabed video and photography, offered suitable substrate for the attachment of solitary epifauna such as the barnacle *Verruca stroemia* and calcareous tube building polychaetes of the genus *Spirobranchus*, as well as colonial epifaunal taxa, notably bryozoan and hydroids.

There was considerable variation in the number of taxa and individuals across the survey area, which resulted in eleven macrofaunal assemblages being identified through the multivariate analysis. Each multivariate group had an average similarity ≤ 44 %, reflecting the heterogeneity of the seabed sediment in a high energy environment. This was further confirmed by the moderate correlation between the observed pattern of macrofaunal distribution and the sediment particle sizes, which was interpreted as a reflection of the constant sediment reworking.

The infaunal biomass was represented mainly by Annelida owing to the numerical dominance of this phylum's invertebrates and Echinodermata, the latter associated with the abundance of brittlestars as well as the size of urchins, typically *E. cordatum*, which can grow up to 9 cm (Hill, 2008), *P. miliaris* which can reach 5.7 cm (Jackson, 2008).

Colonial epifauna from the grab samples was represented by bryozoans, hydroids, sponges and ciliates, the occurrence of which was generally higher at stations featuring coarser and/or mixed sediment, owing to the sediment coarseness and diversity which provide microhabitats and hard substrate for the settlement of epibenthic taxa. This in turn increase the structural complexity of the habitat and may provide additional microhabitats for smaller fauna, thus increasing the overall richness and diversity (BRIG, 2011), as recorded in this study.

Epibenthic species recorded through seabed video and photography included arthropods such as hermit crabs of the family Paguridae and crabs of the genus Inachus, molluscs, such as gastropods of the family Buccinidae, *C. zizyphinum* and *C. granulatum*, bivalves of the family Pectinidae, including *A. opercularis*. Other notable motile species included the echinoderms, *A. rubens* and *P. miliaris* and brittlestars of the class Ophiuroidea, including *O. fragilis*. Epifauna was represented by anemones of the order Actiniaria, including species of the family Sagartiidae and the genus *Urticina*, the soft coral *A. digitatum*, polychaete tubes including *S. spinulosa* and species of *Spirobranchus*. Bryozoans included *Pentapora foliacea*, *Alcyonidium diaphanum* and species of the family Flustridae, including *Flustra foliacea*. Fish included *Scyliorhinus canicula*, and species of the family Gobiidae. Colonial epifauna from the grab samples, along with mobile epibiota recorded through the seabed video and photography comprised assemblages comparable to those reported to be typical of the shallower sediment areas of the southern North Sea (Callaway et al., 2002; Jennings et al., 1999).

5.4 Habitats and Biotopes

5.4.1 Intertidal

One habitat complex, one habitat, two biotope complexes, eight biotopes and one sub-biotope were identified across the intertidal survey area.

The foreshore featured sand with varying proportion of gravel and hard substrate associated with sea defence structures. The latter were represented by wooden groynes to the north-east of the survey area (near Frinton-on-Sea), concrete recurved and/or stepped revetment sea walls and rock armour (across most of the survey area) and fishtail rock groynes to the south-west of the survey area (near Holland-on-Sea).

Epifauna colonising the hard substrate was ubiquitous across the survey area, whereas the flora differed, thus underpinning the habitat classifications. Most of the sedimentary areas were classified at habitat complex level owing to the paucity of the fauna which was confirmed by the results of the core samples analysis.

Limited numbers of species are able to survive on exposed shores, owing to constant sediment reworking which prevent the establishment of stable faunal communities. A major biological influence on community structure is the presence of algae canopies, including ephemeral algal turfs of *Ulva* and *Porphyra*, which can increase biodiversity by supporting a variety of species that would otherwise not occur. Macroalgae such as *Fucus*, provide shelter from wave action, desiccation and heat and may act as substrate for the attachment of epifauna, as well as being food source (Jones et al., 2000).

5.4.2 Export Cable Route

Three biotope complexes and three biotopes were identified along the ECR.

The predominant habitat along the ECR was mixed sediments, with most stations being classified as ‘Circalittoral mixed sediment’ (A5.44) and ‘Polychaete-rich deep *Venus* community in offshore mixed sediments' (A5.451) the latter being the only biotope within the biotope complex 'Offshore circalittoral mixed sediment' (A5.45) (JNCC, 2015).

The 27 stations classified with these biotopes were mostly in the offshore and central section of the ECR (survey blocks FE4, FE5 and FE6), with only seven of these stations being along the nearshore section of the ECR (survey block FE7). The central section of the ECR featured predominantly coarse sediment, with seven stations, most of which in survey block FE6 being classified as 'Circalittoral coarse sediment' (A5.14).

The biotope '*Glycera lapidum* in impoverished infralittoral mobile gravel and sand' (A5.135) classified three stations along or close to the nearshore section of the ECR (survey blocks FE6 and FE7). These stations featured poorly sorted gravelly sand and infauna characterised by polychaetes including *G. lapidum* and *Glycera alba*. *Glycera lapidum* is a species complex, rarely considered a characteristic species and where this is the case it is normally due to the exclusion of other species. As such, habitats containing this biotope may be subject to sediment disturbance from wave action, which prevents the establishment of a more stable community. This biotope is considered representative of impoverished, transitional community, which in more settled conditions develops into stable communities therefore there may be seasonal or spatial variability in this community (EEA, 2019). Similarly, the biotope 'Polychaete-rich deep *Venus* community in offshore mixed sediments' (A5.451) can be subject to natural temporal variation in species abundance even during the course of a year. These variations may not alter the biotope classification especially if the sediment type remain unchanged and many of the characteristic species are present (Tillin, 2016).

Stations along the nearshore section of the ECR were predominantly muddy and classified as 'Circalittoral muddy sand' (A5.26) and '*Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment' (A5.261), the latter being typified by a prevalence of A. alba and *N. nucula* at stations FE7b_02 and FE7b_04. The prevalence of *N. nucleus* over *N. nitidosa* may be associated with the sediment at these stations, as *N. nucleus* is reported to live in muddy sediment with a component of gravel, including shells and pebbles, compared to *N. nitidosa* which is reported to live in muddy sediments with a sandy component and rarely gravel (National Museum Wales, 2016). The sediment at these stations had gravel content of up to 22.95 %.

The seabed video and photography recorded the presence of two biotopes which were not corroborated by the grab samples analysis. The biotope '*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment' (A5.445), was assigned to stations FE4_05 and FE5_09. Analysis of the species list indicated no *O. fragilis* nor *O. nigra* at station FE4_05, whereas at station FE_09, 11 individuals of *O. fragilis* and 6 individuals of *O. nigra* were recorded.

The biotope '*Sabellaria spinulosa* on stable circalittoral mixed sediment' (A5.611), was assigned to station FE4_04. Analysis of the species list indicated the presence of three individuals at station FE4_04. The abundance of *S. spinulosa* was relatively low along the ECR, the highest abundance at any one station along the ECR being recorded at station FE4_03 which had 155 individuals.

The biotopes identified through the video data and single point grab sampling were contextualised with the results of the SSS to attempt extrapolation of the biotopes along the ECR.

Biotope complexes were deemed more representative for extrapolation as they encompass biotopes that may grade into each other depending on the hydrodynamics and the sediment deposition, which are seasonal, particularly in high energy areas. Figure 5.1 presents the spatial distribution of the biotope complexes along the ECR.

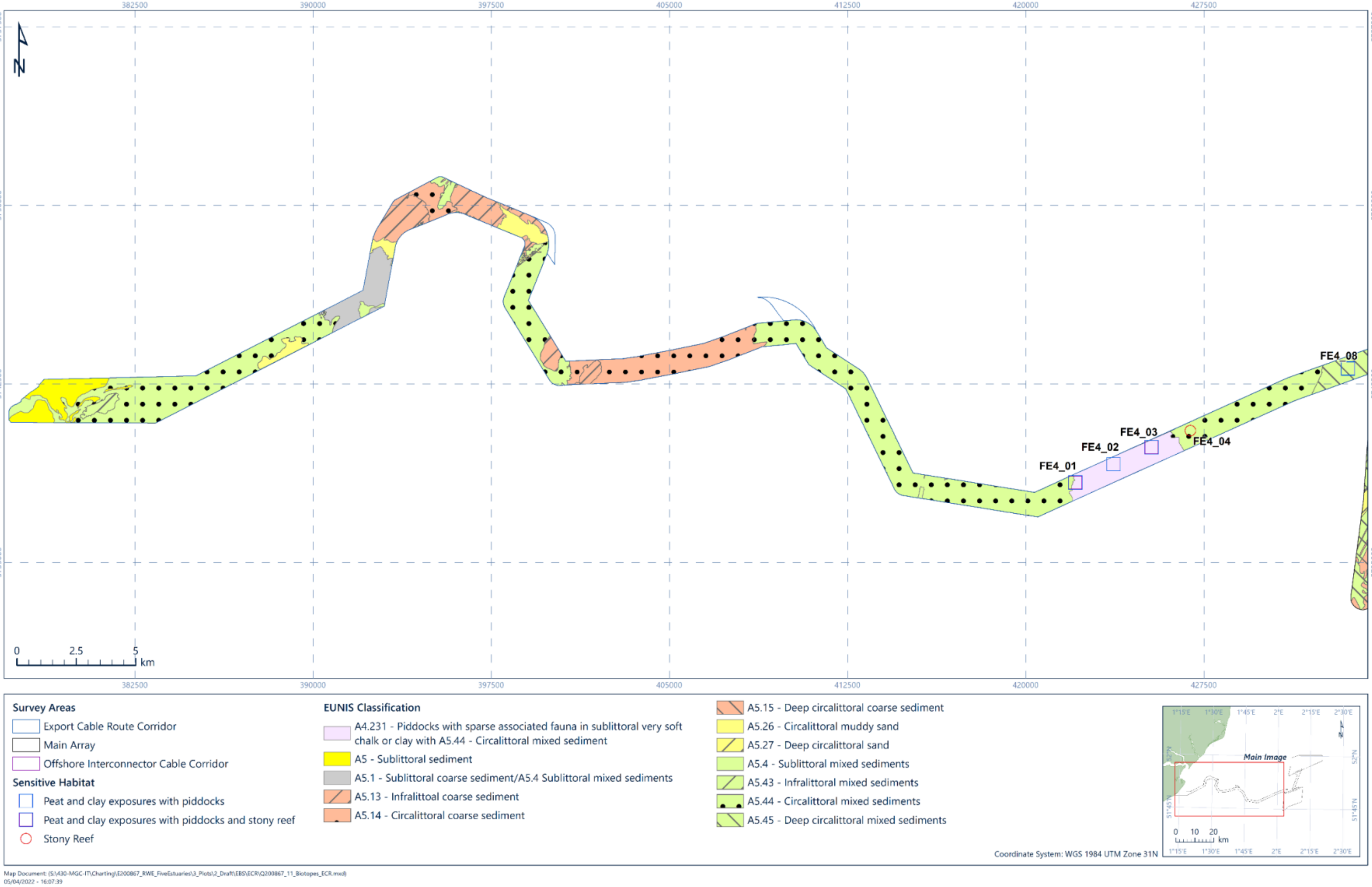


Figure 5.1: Spatial distribution of EUNIS biotope complexes identified through single point grab sampling and side scan sonar data, export cable route, Five Estuaries Offshore Site Investigation

5.4.3 Potentially Sensitive Habitats and Species

Most of the biotopes recorded across the intertidal survey area are part of the BSH 'High energy littoral rock', 'Moderate energy littoral rock' and 'Intertidal sand and muddy sand' in MCZs (JNCC, 2018).

The biotope 'Piddocks with Sparse Associated Fauna in Sublittoral Very Soft Chalk or Clay' (A4.231), was assigned to areas of consolidated mud, based on analysis of seabed and photographic data (detailed in Fugro 2022a). This biotope, reported to occur along the east coast of England, is a UK BAP priority habitat for being fragile and irreplaceable (BRIG, 2011) and may occur in the habitat 'Peat and clay exposure' which is a habitat of conservation importance (HOCI) in MCZs (JNCC, 2018).

Sandy and coarse sediment habitats and biotopes recorded along the ECR, are part of the BSH 'Subtidal sands and gravel", which is a UK BAP priority habitat (BRIG, 2011) and a habitat of conservation importance (HOCI) in MCZs (JNCC, 2016). Biotopes featuring muddy and mixed sediments are part of the BSHs 'Subtidal mud' and 'Subtidal mixed sediments' in MCZs (JNCC, 2018).

The biotope '*Sabellaria spinulosa* on stable circalittoral mixed sediment' (A5.611), is part of the Annex I habitat 'Reefs' when it occurs as biogenic reef (JNCC, 2018). As a biogenic reef, this habitat is also on the OSPAR list of threatened and/or declining species and habitats (OSPAR, 2021).

Aggregations of *S. spinulosa* were recorded through seabed video and photography at stations FE4_04, FE7b_02, FE7d_02a and FE7f_02a. The potential for such aggregations to form Annex I habitat 'Reef' was assessed in line with the criteria detailed in Gubbay (2007), Hendrick and Foster-Smith (2006) and Limpenny et al., (2010), and the methods in Jenkins et al. (2015), and the overall assessment was of 'Not a reef' for all the transects.

In the North Sea, aggregations of *S. spinulosa* can form crusts covering extensive areas of seabed (BRIG, 2011). These crusts may be only seasonal features, being broken up during winter storms and quickly reforming through new settlement the following spring, which is in line with the natural temporal variation of these assemblages (Pearce et al., 2014). As such, these crusts are not considered to constitute *S. spinulosa* reef habitats because of their ephemeral nature (BRIG, 2011). Under specific environmental conditions, *S. spinulosa* can form reefs consisting of hundreds or thousands of worm tubes that stand proud of the seafloor and extend over large areas of gravel and sandy seafloors usually at the edge of sand banks, drop offs and channels. These structures are very variable in height, size and patchiness. They can be temporarily variable in their stability and favour areas of high turbidity and sediment load with moderate tidal currents and suspended particulate food matter (Limpenny et al. 2010). Importantly, even established Annex I '*S. spinulosa* reefs' are potentially highly ephemeral, as demonstrated by changes in location and boundaries, associated with natural variability (Jenkins et al., 2015).

Aggregation of cobbles, along transects at station FE4_01, FE4_02, FE4_03 and FE4_04, were assessed for the potential of these aggregations to constitute Annex I habitat 'Reef', in line with the criteria detailed in Irving (2009) and Golding et al., (2020) for geogenic reefs. The overall assessment for these areas was of 'Low resemblance' to a stony reef or 'Not a reef'. These areas of coarse sediment inclusive of cobbles, are a component part of the mixed sediment seabed type that characterises this region of the North Sea and unlikely to be considered to represent Annex I habitats, in line with Irving (2009) guidelines whereby if a 'Low' is scored in any of the assessment criteria (composition, elevation, extent or biota), then a strong justification would be required for this area to qualify as Annex I habitat 'Reefs' under the current marine nature conservation legislation.

Anemones of the family Edwardsiidae, were recorded in this study; of this family, *Edwardsia timida* is a UK BAP priority species.

5.5 Cryptogenic and Non-native Species (NNS)

Non-native species (NNS) are those that have reached the UK by accidental human transport, deliberate human introduction, or which have arrived by natural dispersion from a non-native population in Europe (Government Digital Service [GDS], 2021). Once introduced, some NNS can become established (grow and reproduce successfully) and their subsequent dispersal from the point of introduction can result in environmental and economic impact (Cottier-Cook et al., 2017). The NNS that have a negative impact on biodiversity, through the spread of disease, competition for resources, or by direct consumption, parasitism, or hybridisation, are termed 'invasive' (GDS, 2020).

Cryptogenic species are those of unknown origin, as such they are not demonstrably native nor introduced (Eno et al., 1997).

Non-native species recorded across the intertidal survey area included *A. modestus* and *M. gigas*.

Individuals of *A. modestus* and *M. gigas* were recorded onto hard substrate in the intertidal survey area. *Magallana gigas* is native of north-east Asia and was introduced worldwide for aquaculture. Owing to its high tolerance to a wide range of seawater temperature and salinity, *M. gigas* is capable of growing in highly variable environments from estuarine areas to brackish waters to offshore areas in oceanic waters (CABI, 2022). The Pacific oyster is found throughout the southern part of the UK, with the largest populations recorded in the Essex estuaries and north Thanet coast (Herbert et al, 2012).

Austrominius modestus is native of Australasia and was first recorded in Chichester Harbour in the early forties, being transported on ships' hulls or possibly on flying boats or through transport of pelagic larvae in ballast water (Eno, 1997). This barnacle grows rapidly, and it withstands reduced salinity, turbid waters, and temperature ranges greater than those tolerated by the native barnacles of the genera *Chthamalus* and *Balanus*, allowing successful colonisation of all shore levels. In addition, *A. modestus* has a rapid rate of growth, reaches maturity in its first season and produces several broods per year, compared to *S. balanoides* which only produces one brood per year (Eno et al., 1997).

Non-native species recorded in the grab samples included the slipper limpet *Crepidula fornicata*. This gastropod imported from North America (Rayment, 2008) has few or no predators in Europe where it can thrive on several types of hard bottoms and shellfish banks (Gofas, 2010). The success of this species is enhanced by the unusual method of reproduction, which relies upon individuals settling upon each other and reproduction thus being assisted through their close proximity, and a pelagic larval stage which aids the spread (Eno et al., 1997)

The cryptogenic species recorded in the grab samples included the polychaetes *Aphelochaeta* (formerly *Tharyx*) *marioni* and the crustacean amphipod *Crassicorophium crassicorne*. Ascidians of the family Didemnidae were also recorded and may therefore include cryptogenic species such as *Diplosoma listerianum*.

The polychaete *A. marioni* has been recorded in estuarine sediments throughout northern Europe, as one of the most common and characteristic species of the habitat (Kakkonen et al., 2019), with a record of in the MNCR surveys (Murray et al., 1999). Nevertheless, *A. marioni* is considered a cryptogenic species due to its prevalence near ports and absence from remote areas (Kakkonen et al., 2019).

The distribution of the crustacean amphipod *C. crassicorne* is reported to be Holarctic and subarctic (Bousfield & Hoover, 1997), with record of this species in the MNCR surveys (Murray et al., 1999). Nevertheless, *C. crassicorne* is considered a cryptogenic species as it is not clear if its current distribution was associated with human mediated transport (Kakkonen et al., 2019).

6. Conclusions

The benthic environment along the export cable route of the VE development was characterised through a subtidal survey which comprised acquisition of seabed video and photographic data and grab samples, which were analysed to identify habitats and to evaluate the physico-chemical and biological conditions of the seabed. The intertidal habitats of the landfall and adjacent areas were characterised by a modified Phase I walkover habitat mapping survey followed by core sampling. The results were used to derive biotopes, in line with the EUNIS habitat classification, which were evaluated for conservation importance and contextualised within the geographical setting of the survey area.

The intertidal survey area featured sedimentary and rocky habitats, the latter also including hard substrata associated with sea defence structures. The fauna colonising the hard substrata was similar across the intertidal survey area and included barnacles, limpets and the Pacific oyster. The flora was represented by seasonal green and red algae as well as perennial fucoid algae, which underpinned the biotope classification. One habitat complex, one habitat, two biotope complexes, eight biotopes and one sub-biotope were identified across the intertidal survey area during the Phase I habitat mapping. Results of the core samples analysis indicate low faunal richness and diversity, with one station being abiotic. Owing to the paucity of the fauna the habitats and biotopes assigned during the Phase I habitat mapping could not be further defined.

The sediment along the ECR was heterogeneous with varying percentages of gravel, sand and fines, which resulted in ten sediment classes being identified through the Folk (BGS modified) classification, of which 'muddy, sandy gravel' typified most stations, whereas 'sand' and 'gravel' each typified one station. The classification of the remaining stations reflected the percentages of the main sediment fractions. The coarseness of the sediment, assessed through the Wentworth (1922) scale, ranged from 'fine silt' to 'pebble', with the highest range of sediment coarseness recorded along the nearshore section of the ECR. The sediments disturbance, likely due to regional hydrodynamics, was reflected in the bimodal and multimodal distribution of sediment particle size recorded at most stations.

The concentrations of total hydrocarbons and the 22 PAHs analysed were below their respective marine SQGs across the intertidal area and along the ECR.

The concentrations of all metals analysed was below their respective marine SQGs across the intertidal area.

Along the ECR, arsenic and nickel concentrations were above the Cefas AL1 at four stations, including two in the offshore section of the ECR, one in the central section and one in the nearshore section. At three of these stations, the nickel concentration was also above the CEMP ERM, whereas arsenic was above the Canadian PEL at two stations and above the CEMP ERM at one station.

The concentration of cadmium was above the Cefas AL1 at one station in the offshore section of the ECR, whereas chromium concentration was above the Cefas AL1 at one station in the central section. However, regional contextualisation of the results indicated that concentrations of arsenic, nickel, chromium and cadmium are within the range of concentrations reported for the Outer Thames Estuary. Copper was above the Canadian TEL at two stations and the remaining metals had concentrations below their respective SQGs.

The concentrations of the sum of the 25 PCB congeners analysed were below the Cefas ALs across the intertidal survey area and along the ECR.

The concentrations of the organotins analysed, namely DBT and TBT, were below the Cefas ALs at all stations across the intertidal survey area and along the ECR.

The concentrations of all OCPs analysed were below the LOD across the intertidal survey area and below the Cefas marine SQGs which currently include dieldrin and DDT.

Macrofauna from the grab samples comprised infaunal and epifaunal taxa, the latter being represented by solitary and colonial organisms. Annelida represented most of the community structure and composition of the enumerated fauna, which comprised infauna and solitary epifauna.

The faunal community structure and composition reflected the sediment diversity and associated hydrodynamics, with typical taxa including robust polychaetes, fast swimming crustaceans, bivalves and echinoderms, with several of the epibenthic taxa recorded in the grab samples being also recorded through seabed video and photography.

Three biotope complexes and three biotopes were identified along the ECR from the grab samples analysis, including 'Circalittoral mixed sediment' (A5.44) and 'Polychaete-rich deep *Venus* community in offshore mixed sediments' (A5.451), which classified most stations.

The biotope complex 'Circalittoral muddy sand' (A5.26) and the biotopes '*Glycera lapidum* in impoverished infralittoral mobile gravel and sand' (A5.13), and '*Abra alba* and *Nucula nitidosa* in circalittoral muddy sand or slightly mixed sediment' (A5.261) classified infralittoral coarse and muddy sediment stations along the nearshore section of the ECR.

In addition, 'Piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231), was recorded only through the seabed video and photography.

The habitats and biotopes recorded are, or are representative of, UK BAP priority habitats and include 'Subtidal sands and gravel' and 'piddocks with sparse associated fauna in sublittoral very soft chalk or clay' (A4.231).

Non-native species recorded across the intertidal survey area included *A. modestus* and the *M. gigas*, whereas *C. fornicata* was recorded in the grab samples. The cryptogenic species recorded in the grab included *A. marioni* and *C. crassicorne*. There is the potential for D. listerianum to occur within the family Didemnidae.

7. References

Ager, O. E. D. (2005). *Spiophanes bombyx A bristleworm*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1705

Biodiversity Reporting and Information Group [BRIG]. (2011). *UK Biodiversity Action Plan: Priority Habitat Descriptions*. Peterborough. https://hub.jncc.gov.uk/assets/2728792c-c8c6-4b8c-9ccd-a908cb0f1432

Blott, S. (2010). *GRADISTAT Version 8.0: A grain size distribution and statistics package for the analysis of unconsolidated sediment by sieving or laser granulometer*. Berkshire: Kenneth Pye Associates.

Bryan, G.W., Gibbs, P.E., Burt, G.R., & Hummerstone, L.G. (1987). The effects of tributyltin (TBT) accumulation on adult dogwhelks, *Nucella lapillus*: long term field and laboratory experiments. *Journal of the Marine Biological Association of the United Kingdom 67*, 525-544. DOI: https://doi.org/10.1017/S0025315400027272

Budd, G.C. & Curtis, L. (2007). *Bathyporeia pelagica A sand digger shrimp*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1576

CABI (2022). *Invasive Species Compendium. Wallingford, UK: CAB International*. www.cabi.org/isc

Callaway, R., Alsvåg, J., De Boois, I., Cotter, J., Ford, A., Hinz, H., Jennings, S., Kröncke, I., Lancaster, J., Piet, G., Prince, P., & Ehrich, S. (2002). Diversity and Community Structure of Epibenthic Invertebrates and Fish in the North Sea. *ICES Journal of Marine Science, 59*, 1199-1214. https://www.researchgate.net/publication/40793458_Diversity_and_community_structure_of_epibenthic_invertebrates_and_fish_in_the_North_Sea

Canadian Council of Ministers of the Environment [CCME] (2022). *Guidelines*. https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines

Cempel, M. & Nikel, G. (2006). Nickel: a review of its sources and Environmental Toxicology. *Polish Journal of Environmental Studies*, *15*(3), 375-382. https://www.researchgate.net/publication/279907606_Nickel_A_Review_of_Its_Sources_and_Environmental_Toxicology

Centre for Environment Fisheries & Aquaculture Science [Cefas] (2020). *Review of Action Levels used for assessing dredging and disposal marine licences*. Final Report.

http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=20243

Centre for Environment Fisheries and Aquaculture Science [Cefas] (2012). *Monitoring of the quality of the marine environment, 2008–2010*. Science Series Aquatic Environment Monitoring Reports, CEFAS Lowestoft, 63: 111pp.

Clarke, K. R., Somerfield, P. J. & Gorley, R. N. (2008). Testing of Null Hypothesis in Exploratory Community Analysis: Similarity Profiles and Beta-Environment Linkage. *Journal of Experimental Marine Biology and Ecology*, *366*, 56-69. https://doi.org/10.1016/j.jembe.2008.07.009

Clarke, K.R. & Gorley, R.N. (2015). *PRIMER v7: User Manual/Tutorial.,* Plymouth: PRIMER-E.

Clarke, K.R., Gorley, R.N., Somerfield, P.J. & Warwick, R.M. (2014). *Change in marine communities: an approach to statistical analysis and interpretation.* 3rd Edition. PRIMER-E Ltd, Plymouth Marine Laboratory, UK.

Cottier-Cook, E. J., Beveridge, C., Bishop, J. D. D., Brodie, J. Clark, P. F., Epstein, G., Jenkins, S. R., Johns, D. J. Loxton, J. MacLeod, A., Maggs, C., Minchinh, D., Mineuri, F., Sewell J. & Wood, C.A. (2017). Non-Native species. *Marine Climate Change Impact Partnership [MCCIP]: Science Review*, 47-61. doi:10.14465/2017.arc10.005-nns

Dauvin, J.C., Alizier, S., Rolet, C., Bakalem, A., Bellan, G., Gesteira, J.G., Grimes, S., De-La-Ossa-Carretero, J.A. & Del-Pilar-Ruso, Y. (2012). Response of different benthic indices to diverse human pressures. *Ecological Indicators*, *12*(1), 143-153. https://doi.org/10.1016/j.ecolind.2011.03.019

Davies, C.E. & Moss, D. (2004). *EUNIS Habitat Classification Marine Habitat Types: Revised Classification and Criteria*. Centre for Ecology & Hydrology (CEH) Dorset, Document No. C02492NEW.

Davies, J., Baxter, J., Bradley, M, Connor, D., Khan, J., Murray, E., Sanderson, W., Turnbull, C., & Vincent, M. (2001). *Marine Monitoring Handbook*. https://hub.jncc.gov.uk/assets/ed51e7cc-3ef2-4d4f-bd3c-3d82ba87ad95

Davy, A. J., Brown, M.J., Mossman H. L. & Grant, A. (2011). Colonization of a newly developed salt marsh: disentangling independent effects of elevation and redox potential on halophytes. *Journal of Ecology 99*, 1350–1357. doi: 10.1111/j.1365-2745.2011.01870.x

de Mora, S., Sheikholeslami, M. R., Wyse, E., Azemard, S. & Cassi, R. (2004). An assessment of metal contamination in coastal sediments of the Caspian Sea. *Marine Pollution* Bulletin, *48*, 61-77. https://www.researchgate.net/publication/8917388_An_assessment_of_metal_contamination_in_coastal_sediments_of_the_Caspian_Sea

De-Bastos, E. S. R. (2016). *Kurtiella bidentata* and *Abra* spp. in infralittoral sandy mud. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key

Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/habitat/detail/1094

Delivering Alien Invasive Species Inventories for Europe [DAISIE]. (2020). *DAISIE - Inventory of alien invasive species in Europe*. Version 1.7. Research Institute for Nature and Forest (INBO). https://doi.org/10.15468/ybwd3x

Department of Trade and Industry [DTI] (2002). *North Sea Geology*. Technical report produced for Strategic Environmental Assessment – SEA2 & SEA3. Technical Report TR_008_Rev1.

Department of Trade and Industry [DTI]. (2001). *Contamination status of the North Sea*. Technical report produced by Cefas for Strategic Environmental Assessment – SEA2. Technical Report TR_004.

Díez, S., Lacorte, S., Viana, P., Barceló, D., & Bayona, J.M. (2005). Survey of organotin compounds in rivers and coastal environments in Portugal 1999-2000. *Environmental Pollution*, *136,* 525-536. DOI: 10.1016/j.envpol.2004.12.011

Dowson, P.H., Budd, J.M., & Lester, J.N. (1996). Persistence and degradation pathways of tributyltin in freshwater and estuarine sediments. *Estuarine, Coastal and Shelf Science 42*, 551-562. https://doi.org/10.1006/ecss.1996.0036

Eleftheriou, A., Basford, D., & Moore, D.C. (2004). *Synthesis of information on the benthos of Area Sea 5.* Report for the Department of Trade and Industry [DTI].

Eleftheriou, E. & Basford, D. J. (1989). The Macrobenthic Fauna of the Offshore Northern North Sea. *Journal of the Marine Biological Association of the United Kingdom, 69*, 123-143. https://doi.org/10.1017/S0025315400049158

Ellis, J. R., Maxwell, T., Schratzberger, M. & Rogers S.I. (2011). The benthos and fish of offshore sandbank habitats in the southern North Sea. *Journal of Marine Biological Association of the United Kingdom, 91(6):* 1319-1335. https://doi.org/10.1017/S0025315410001062

Eno, N.C., Clark, R. A. & Sanderson W. G. (1997). *Non-native marine species in British waters: a review and directory*. Joint Nature Conservation Committee [JNCC]. ISBN 1 86107 442 5. https://www.researchgate.net/publication/237516977_Non-Native_Marine_Species_in_British_Waters_A_Review_and_Directory

European Environment Agency [EEA]. (2019). *European Nature Information Service [EUNIS] habitat type hierarchical view.* http://eunis.eea.europa.eu/habitats-code-browser.jsp

European Marine Observation Data Network [EMODnet]. (2021). *Seabed habitats project.* http://www.emodnet-seabedhabitats.eu

Farrington, J.W., & Tripp, B.W. (1977). Hydrocarbons in western North Atlantic surface sediments. Geochimica and Cosmochimica Acta 41,1627–1641. https://doi.org/10.1016/0016-7037(77)90173-9

Fischer, W.R. & Böttcher, J. (2000). *Redox – Fundamentals, Processes and Applications*. Schüring J. Schulz H. D., Fischer W. R., Böttcher J. and Duijnisveld W.H.M. eds. Springer-Verlag Berlin-Heidelberg), 251pp.

Five Estuaries Offshore Wind Farm (2021). *Benthic Subtidal & Intertidal Ecology Baseline Survey Scope of Works*. Document Reference 003428631-02, Revision 2.1.

Fofonoff, P. W., Ruiz, G. M., Steves, B., Simkanin, C. & Carlton, J. T. (2022). *National Exotic Marine and Estuarine Species Information System*. http://invasions.si.edu/nemesis/

Folk, R. L. & Ward, W. C. (1957). Brazos River bar (Texas); a study in the significance of grain size parameters. *Journal of Sedimentary Research, 27*(1), 3-26. https://doi.org/10.1306/74d70646-2b21-11d7-8648000102c1865d

Folk, R. L. (1954). The distinction between grain size and mineral composition in sedimentary rock nomenclature. *Journal of Geology*, *65*(4), 344-359. https://doi.org/10.1086/626171

Fugro. (2021a). *Fugro – WPM3 Operations/Acquisition Report – Fugro Seeker.* Fugro Document No.: 004032864. Fugro GB Marine Limited.

Fugro (2021b). Fugro - *WPM1, WPM2 & WPM3 - Acquisition / Operations Report – Marshall Art.* Fugro Document No. 004032865. Fugro GB Marine Limited.

Fugro (2021c). *Fugro – WPM4 – ECR (Intertidal) – Benthic Intertidal Operations Report*. Document No. 004076666-02. Fugro GB Marine Limited.

Fugro (2022a). Fugro - WPM1, WPM2 & WPM3 - *Main Array & ECR - Environmental Features Report*. Fugro Document No.: 004032870. Fugro GB Marine Limited.

Fugro (2022b). Fugro – *WPM1 & WPM2 Array, Interconnector & ECR Operations Report – Fugro Mercator*. Fugro Document No.: 004032863. Fugro GB Marine Limited.

Fugro (2022c). Fugro – *WPM2& WPM3 ECR Shallow Geological Results Report*. Fugro Document No.: 004032869. Fugro GB Marine Limited.

Fugro (in press). Fugro – WPM2, WPM3 & WPM4 – Main Array Benthic Ecology Monitoring Report. Fugro Document No.: 004032871. Fugro GB Marine Limited.

Gadd, G.M. (2000). Microbial interactions with tributyltin compounds: detoxification, accumulation, and environmental fate. *The Science of the Total Environment 258*, 119-127. DOI: 10.1016/s0048-9697(00)00512-x

Gaston, G. R., J. A. McLelland and R. W. Heard. 1992. Feeding Biology, Distribution, and Ecology of Two Species of Benthic Polychaetes: *Paraonis fulgens* and *Paraonis pygoenigmatica* (Polychaeta: Paraonidae). *Gulf Research Reports 8(4*), 395-399. DOI: https://doi.org/10.18785/grr.0804.05

Geisler, C. D. & Schmidt, D. (1991). An overview of chromium in the marine environment. *Deutsche Hydrographische Zeitschrift 44*, 185–196. https://doi.org/10.1007/BF02226462

Gerwing, T. G., Gerwing, A., M., A., Drolet, D., Hamilton, D. J. & Barbeau, M. A. (2013). Comparison of two methods of measuring the depth of the redox potential discontinuity in intertidal mudflat sediments. *Marine Ecology Progress Series*, *487*, 7-13. doi: 10.3354/meps10407

Geyer, H., Freitag, D., & Korte, F. (1984). Polychlorinated biphenyls (PCBs) in the marine environment, particularly in the Mediterranean. *Ecotoxicology and Environmental Safety*, *8*(2), 129-151. https://doi.org/10.1016/0147-6513(84)90056-3

Glémarec, M. (1973). The benthic communities of the European North Atlantic Continental Shelf. *Oceanography and Marine Biology Annual Review*, *11*, 263-289.

Gofas, S. (2010). *Crepidula fornicata (Linnaeus, 1758). World Marine Mollusca database*. Accessed through: World Register of Marine Species. http://www.marinespecies.org/aphia.php?p=taxdetails&id=138963

Gofas, S. & Salas, C. (2008). A review of European '*Mysella*' species (Bivalvia, Montacutidae), with description of *Kurtiella* new genus. *Journal of Molluscan Studies*, *78*, 119-135. https://www.researchgate.net/publication/249276799_A_review_of_European_'Mysella'_species_Bivalvia_Montacutidae_with_description_of_Kurtiella_new_genus

Golding. N., Albrecht. J. & McBreen. F. (2020.) *Refining criteria for defining areas with a 'low resemblance' to Annex I stony reef; Workshop Report*. (JNCC Report No. 656). Joint Nature Conservation Committee [JNCC], Peterborough, ISSN 0963-8091. https://data.jncc.gov.uk/data/4b60f435-727b-4a91-aa85-9c0f99b2c596/JNCC-Report-656-FINAL-WEB.pdf

Government Digital Service [GDS] (2020). *Strategy for England's wildlife and ecosystem services, biodiversity 2020 indicators Trends in pressure on biodiversity - invasive species*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/925441/20_Pressure_from_invasive_species_2020_accessible.pdf

Government Digital Service [GDS] (2021). *Strategy for England's wildlife and ecosystem services, biodiversity 2020 indicators Trends in pressure on biodiversity - invasive species*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/925441/20_Pressure_from_invasive_species_2020_accessible.pdf

Gubbay, S. (2007) *Defining and managing Sabellaria spinulosa reefs: Report of an inter-agency workshop 1-2 May 2007*. Joint Nature Conservation Committee (JNCC) Report No. 405. https://data.jncc.gov.uk/data/ecdbc5ba-e200-47e3-b7c6-adf464287712/JNCC-Report-405-FINAL-WEB.pdf

Hartley, J. P. (1996). Environmental monitoring of offshore oil and gas drilling discharges—A caution on the use of barium as a tracer. *Marine Pollution Bulletin*, *32*(*10*), 727–733. https://doi.org/10.1016/0025-326x(96)00033-1.

Hein, F. J. (2007). The Size Analyses in Marine Geotechnical Studies. In S. J. P. M. (Eds). *Principles, Methods and Application of Particle Size Analysis* (pp. 346-362). Cambridge University Press.

Heip, C., Basford, J.A., Craeymeersch, J.A., Dewarumez, J. Dörjes, J., De Wilde, P., Duineveld, G., Eleftheriou, A., Herman, P.M.J., Niermann, U. Kingstone, P., Künitzer, A., Rechor, E. Rumohr, H., Soetaert, K. & Soltwedel, T. (1992). Trends in biomass, density and diversity of North Sea macrofauna. *ICES Journal of Marine Science*, *49*, 13-22. https://www.researchgate.net/publication/237091107_Trends_in_Biomass_Density_and_Diversity_of_North-Sea_Macrofauna

Hendrick, V.J. and Foster-Smith, R.L. (2006). *Sabellaria spinulosa* reef: a scoring system for evaluating 'reefiness' in the context of the Habitats Directive. *Journal of the Marine Biological Association of the United Kingdom*, *86*, 665-677. https://www.dassh.ac.uk/dataDelivery/filestore/8/9/0/3_50fd853b85cfdfd/8903_4a9196bfd29f418.pdf

Herbert, R.J.H., Roberts, C. Humphreys, J and Fletcher, S. (2012). *The Pacific oyster (Crassostrea gigas) in the UK: Economic, legal and environmental issues associated with its cultivation, wild establishment and exploitation.* Report for the Shellfish Association of Great Britain.

Hill, J. M. (2008). *Echinocardium cordatum Sea potato*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1417

Hiscock, K. (Ed). (1996). *Marine Nature Conservation Review: rationale and methods. Peterborough, Joint Nature Conservation Committee*. Coasts and Sea of the United Kingdom, MNCR Series.

Hitchin, R., Turner, J.A., and Verling, E. 2015. *Epibiota Remote Monitoring from Digital Imagery: Operational Guidelines*. http://www.nmbaqcs.org/media/1591/epibiota_operational_guidelines_final.pdf

Howson, C.M. & Picton, B.E. eds. (1997). *The species directory of the marine fauna and flora of the British Isles and surrounding seas* (Ulster Museum Publication No. 276). Ulster Museum.

Huang, G., Bai, Z., Dai, S., & Xie, Q. (2004). Accumulation and toxic effect of organometallic compounds on algae. *Applied Organometallic Chemistry*, *7*(*6*), 373-380. DOI:10.1002/AOC.590070604

International Union for Conservation of Nature and Natural Resources [IUCN]. (2022). *The IUCN red list of threatened species*. Version 2021-3. https://www.iucnredlist.org

Irving R. A. (1998). The seabed. In Barne JH, Robson CF, Kaznowska SS, Doody JP, Davidson NC Buck AL (Eds), *Coasts and seas of the United Kingdom. Region 7 South-west England: Lowestoft to Dungeness*. pp 67-72. Peterborough, Joint Nature Conservation Committee

(Coastal Directory Series). https://data.jncc.gov.uk/data/6473ed35-d1cb-428e-ad69-eb81d6c52045/pubs-csuk-region-07.pdf

Irving, R. (2009). *The identification of the main characteristics of stony reef habitats under the Habitats Directive. Summary report of an inter-agency workshop 26-27 March 2008* (Report No. 432). Joint Nature Conservation Committee [JNCC]. http://data.jncc.gov.uk/data/21693da5-7f59-47ec-b0c1-a3a5ce5e3139/JNCC-Report-432-FINAL-WEB.pdf

Jackson, A. (2008). *Ophiothrix fragilis Common brittlestar*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1198

Jackson, A. 2008. *Psammechinus miliaris Green sea urchin*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1189

Jenkins, C., Eggleton, J. Albrecht, J., Barry, J., Duncan, G., Golding, N. & O'Connor, J. (2015). *North Norfolk Sandbanks and Saturn Reef cSAC/SCI management investigation report*. JNCC/Cefas Partnership Report, No. 7. https://data.jncc.gov.uk/data/c09e7cc0-b4dd-4b28-918c-277301806738-NNSB-FINAL-REPORT-2015101.pdf

Jennings, S., Lancaster, J., Woolmer, A. & Cotter, J. (1999). Distribution, Diversity and Abundance of Epibenthic Fauna in the North Sea. *Journal of the Marine Biological Association of the UK, 79*, 385-399. https://www.researchgate.net/publication/216900288_Distribution_diversity_and_abundance_of_epibenthic_fauna_in_the_North_Sea

Joint Nature Conservation Committee [JNCC] (2016). *Review of the MCZ Features of Conservation Importance. JNCC and Natural England, Peterborough*. https://data.jncc.gov.uk/data/94f961af-0bfc-4787-92d7-0c3bcf0fd083/MCZ-review-foci-201605-v7.0.pdf

Joint Nature Conservation Committee [JNCC] (2018). *Marine habitat correlation tables version 201801 – spreadsheet version 2018*. https://hub.jncc.gov.uk/assets/62a16757-e0d1-4a29-a98e-948745804aec

Joint Nature Conservation Committee [JNCC] (2019). UK Biodiversity Action Plan. https://jncc.gov.uk/our-work/uk-bap/

Joint Nature Conservation Committee [JNCC]. (2004a). Common Standards Monitoring Guidance for Littoral Sediment Habitats. *Version August 2004. ISSN 1743-8160* https://data.jncc.gov.uk/data/9b4bff32-b2b1-4059-aa00-bb57d747db23/CSM-LittoralSedimentHabitats-2004.pdf

Joint Nature Conservation Committee [JNCC]. (2004b). Common Standards Monitoring Guidance for Littoral Rock and Inshore Sublittoral Habitats. *Version August 2004. ISSN 1743-8160.* https://data.jncc.gov.uk/data/9b4bff32-b2b1-4059-aa00-bb57d747db23/CSM-Littoral-SublittoralRock-2004.pdf

Joint Nature Conservation Committee [JNCC]. (2010). *Handbook for Phase 1 habitat survey*. http://jncc.defra.gov.uk

Joint Nature Conservation Committee [JNCC]. (2015). *The Marine Habitat Classification for Britain and Ireland Version 15.03.* https://mhc.jncc.gov.uk/about/

Joint Nature Conservation Committee [JNCC]. (n.d.). *Annex I habitats list*. https://sac.jncc.gov.uk/habitat/

Joint Nature Conservation Committee [JNCC]. (n.d.). *Annex II species list*. https://sac.jncc.gov.uk/species/

Jones, L.A., Coyle, M.D., Evans, D., Gilliland, P.M. & Murray, A.R. (2005). *Southern North Sea Marine Natural Area Profile: A contribution to regional planning and management of the seas around England*. Peterborough: English Nature (now Natural England). http://publications.naturalengland.org.uk/file/60008

Jones, L.A., Hiscock, K. & Connor, D.W. (2000). *Marine habitats reviews. A summary of ecological requirements and sensitivity characteristics for the conservation and management of marine SACs*. Peterborough, Joint Nature Conservation Committee (UK Marine SACs Project report.)

Kakkonen, J.E, Worsfold, T.M, Ashelby, C.W., Taylor, A. & Beaton, K. (2019). The value of regular monitoring and diverse sampling techniques to assess aquatic non-native species: a case study from Orkney. *Management of Biological Invasions 10*(1), 47-49. https://www.proquest.com/docview/2285117742?pq-origsite=gscholar&fromopenview=true

Keith, L.H. (2015). The source of US EPA's sixteen PAH priority pollutants. *Polycyclic Aromatic Compounds*, *35*(2-4), 147-160. https://doi.org/10.1080/10406638.2014.892886

Künitzer, A., Basford, D., Craeymeersch, J.A., Dewarumez, J.M., Dörjes, J., Duineveld, G.C.A., Eleftheriou, A., Heip, C. Herman, P. Kingston, P., Niermann, U., Rachor, E., Rumohr, H. & De Wilde, P.A.J. (1992). The benthic infauna of the North Sea: species distribution and assemblages. *ICES Journal of Marine Science*, *49*, 127-143. https://www.researchgate.net/publication/249283769_The_benthic_infauna_of_the_North_Sea_species_distribution_and_assemblages

Lavesque, N., Bonifácio, P., Meißner, K., Blanchet, H., Goillieux, B., Dubois, S. & Bachelet, G. (2014). New records of *Spio symphyta* and *Spio martinensis* ('Polychaeta': Canalipalpata: Spionidae) from Arcachon Bay (France), NE Atlantic. *Marine Biodiversity*. DOI 10.1007/s12526-014-0230-7

Limpenny, D.S., Foster-Smith, R.L., Edwards, T.M., Hendrick, V.J., Diesing, M., Eggleton, J.D., Meadow, W.J., Crutchfield, Z., Pfeifer, S. and Reach, I.S. (2010). *Best Methods for Identifying and Evaluating Sabellaria spinulosa and Cobble Reef. Aggregate Levy Sustainability Fund Project. MAL0008*. Joint Nature Conservation Committee, Peterborough, pp. 134, ISBN – 978 0 907545 33 0.

Long, D. (2006). *BGS Detailed explanation of seabed sediment modified Folk classification*. MESH (Mapping European Seabed Habitats). https://www.researchgate.net/publication/284511408_BGS_detailed_explanation_of_seabed_sediment_modified_folk_classification

Long, E.R, MacDonald, D.D., Smith, S.L. & Calder, F.D. (1995). Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environmental Management*. DOI: 10.1007/BF02472006. https://www.researchgate.net/publication/225598600

Marine Aggregate Levy Sustainability Fund [MALSF], (2009). *Outer Thames Estuary Regional Environmental Characterisation.* Report commissioned by the Marine Environment Protection Fund (MEPF). https://eprints.soton.ac.uk/153173/

Marine Management Organisation [MMO]. (2015). *High level review of current UK action level guidance.* A report produced for the Marine Management Organisation. (MMO Project No: 1053). Marine Management Organisation.

Mason, C. (2016). *NMBAQC's Best Practice Guidance*. Particle Size Analysis (PSA) for Supporting Biological Analysis. 77pp. http://www.nmbaqcs.org/media/1255/psa-guidance_update18012016.pdf

Mason, C.; Vivian, C.; Griffith, A.;Warford, L.; Hynes, C.; Barber, J.; Sheahan, D.; Bersuder, P.; Bakir, A.; Lonsdale, J.-A. Reviewing the UK's Action Levels for the Management of Dredged Material. *Geosciences 12*(3). https:// doi.org/10.3390/geosciences12010003

Meyers, P. A., & Quinn, J. G. (1973). Association of Hydrocarbons and mineral particles in saline solution. *Nature*, *244*(5410), 23–24. https://doi.org/10.1038/244023a0

Murray E, Dalkin MJ, Fortune F, Begg K (1999) *Marine Nature Conservation Review Sector 2. Orkney: area summaries. Coasts and seas of the United Kingdom, MNCR series*. Joint Nature Conservation Committee, Peterborough, U.K., 122 pp.

National Biodiversity Network. [NBN]. (2021). *NBN Atlas* http://www.nbnatlas.org

National Museum Wales (2016). Marine bivalve shells of the British Isles. https://naturalhistory.museumwales.ac.uk/BritishBivalves/browserecord.php?-recid=283

Neff, J.M. (1997). Ecotoxicology of arsenic in the marine environment – Review. E*nvironmental Toxicology and Chemistry, 16*(5), 917–927. https://www.researchgate.net/publication/229608565_Ecotoxicology_of_Arsenic_in_the_Marine_Environment_-_Review

Non-native Species Secretariat [NNSS] (2022). *The GB non-native species secretariat website*. http://www.nonnativespecies.org/home/index.cfm

Nriagu, J.O. (1990). Global metal Pollution: Poisoning the Biosphere? *Environment: Science and Policy for Sustainability Development, 32*(7), 7-33. https://doi.org/10.1080/00139157.1990.9929037

Oslo and Paris Commission [OSPAR]. (2009). *Background document on CEMP assessment criteria for the QSR 2010*. Monitoring and Assessment Series. Report No. 978-1-907390-08-1. https://qsr2010.ospar.org/media/assessments/p00390_supplements/p00461_Background_Doc_CEMP_Assessmt_Criteria_Haz_Subs.pdf

Oslo and Paris Commission [OSPAR] (2014). *Levels and trends in marine contaminants and their biological effects – CEMP assessment report 2013*. *Monitoring and Assessment Series*. OSPAR Publication No. 631/2014). OSPAR Commission.

Oslo and Paris Commission [OSPAR]. (2016). *Metals in sediment and biota: status and trend of copper burden*. Radioactive Substances Series. (OSPAR Publication No. 677/2016). https://www.ospar.org/documents?v=35698

Oslo and Paris Commission [OSPAR]. (2021). *List of Threatened and/or Declining Species & Habitats*. https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats

Pearce, B., Farinas-Franco, J.M., Wilson, C., Pitts, J., Deburgh, A. & Somerfield, P.J. 2014. Repeated Mapping of Reefs Constructed by *Sabellaria spinulosa* Leuckart 1849 at an offshore wind farm site. *Continental Shelf Research*, *83*, 3-13. https://www.researchgate.net/publication/260270827_Repeated_mapping_of_reefs_constructed_by_Sabellaria_spinulosa_Leuckart_1849_at_an_offshore_wind_farm_site

Rayment, W. J. (2008). *Crepidula fornicata Slipper limpet.* In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1554

Readman, J.W., Fillmann. G., Tolosa. I., Bartocci. J., Villeneuve. J.P., Catinni. C., & Mee, L.D. (2002). Petroleum and PAH contamination of the Black Sea. *Marine Pollution Bulletin, 44*, 48 62. https://doi.org/10.1016/S0025-326X(01)00189-8

Rees, H. L., Eggleton, J. D., Rachor, E. & Vanden Berghe, E. (2007). *Structure and Dynamics of the North Sea Benthos*. ICES Cooperative Research Report no. 288, 258 pp. https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR288.pdf

Rifkin, E., Gwinn, P. & Bouwer, E. (2004). Chromium and sediment toxicity. Environmental Science and Technology 38(14):267A-271A. https://pubs.acs.org/doi/pdf/10.1021/es040575m

Roche, C., Lyons, D. O., Farinas Franco, J. & O'Connor, B. (2007). *Benthic surveys of sandbanks in the Irish Sea. Irish Wildlife Manuals, No. 29.* National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Sabatini, M. & Ballerstedt, S. (2008). *Nucula nitidosa*. *A bivalve mollusc*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/species/detail/1700

Simboura, N., Sigala, K., Voutsinas, E., & Kalan, E. (2008). First occurrence of the invasive alien species *Polydora cornuta* Bosc, 1802 (Polychaeta: Spionidae) on the coast of Greece (Elefsis Bay; Aegean Sea). *Mediterranean Marine Science, 9*(2), 119-124.

The Marine Biological Association of the UK. (2021). *The Marine Life Information Network*. https://www.marlin.ac.uk/

Tillin, H.M. (2016). Polychaete-rich deep *Venus* community in offshore gravelly muddy sand. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/habitat/detail/1117

Tillin, H.M., Tyler-Walters, H. & Garrard, S. L. (2019). *Infralittoral mobile clean sand with sparse fauna*. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. https://www.marlin.ac.uk/habitat/detail/262

Vane, C.H., Turner, G.H., Cheney, S.R., Richardson, M., Cave, M.C., Terrington, R., Gowing, C,J.B. & Moss-Hayes, V. (2020). Trends in heavy metals, polychlorinated biphenyls and toxicity from sediment cores of the inner River Thames estuary, London, UK. *Environmental Science: Processes Impacts, 22*, 364-380. DOI: 10.1039/c9em00430k

Volkman, J.J., Holdsworth, D.J., Neill, G.P., & Bavor, H.J., Jr. 1992. Identification of natural, anthropogenic and petroleum hydrocarbons in aquatic sediments. *Science of the Total Environment 112 (2-3)*, 203-219. https://doi.org/10.1016/0048-9697(92)90188-X

Walker, A. J. M. & Rees, E. I. S. (1980). Benthic ecology of Dublin Bay in relation to sludge dumping. *Irish Fisheries Investigation Series B (Marine)*, *22,* 1-59.

Wentworth, C.K. (1922). A scale of grade and class terms for clastic sediments. *Journal of Geology*, *30,* 377-392. https://doi.org/10.1086/622910

Whalley, C., Rowlatt, S., Bennet, M. & Lavell, D., 1999. Total Arsenic in Sediments from the Western North Sea and the Humber Estuary. *Marine Pollution Bulletin*, *38(5),* 394-400.

World Register of Marine Species (WoRMS) Editorial Board (2022). *World register of marine species.* https://www.marinespecies.org

Worsfold, T.M., Hall, D.J. & O'Reilly, M. (Ed.). (2010). *Guidelines for processing marine macrobenthic invertebrate samples: a Processing Requirements Protocol*: Version 1.0, June 2010. Report to the NMBAQC Committee. http://www.nmbaqcs.org/media/1175/nmbaqc-inv-prp-v10-june2010.pdf

Appendices

Appendix A

Guidelines on Use of Report

This report (the "Report") was prepared as part of the services (the "Services") provided by Fugro GB Marine Limited ("Fugro") for its client (the "Client") under terms of the relevant contract between the two parties (the "Contract"). The Services were performed by Fugro based on requirements of the Client set out in the Contract or otherwise made known by the Client to Fugro at the time.

Fugro's obligations and liabilities to the Client or any other party in respect of the Services and this Report are limited in time and value as defined in Contract (or in the absence of any express provision in the Contract as implied by the law of the Contract) and Fugro provides no other representation or warranty whether express or implied, in relation to the Services or for the use of this Report for any other purpose. Furthermore, Fugro has no obligation to update or revise this Report based on changes in conditions or information which emerge following issue of this Report unless expressly required by the Contract.

The Services were performed by Fugro exclusively for the Client and any other party identified in the Contract for the purpose set out therein. Any use and/or reliance on the Report or the Services for purposes not expressly stated in the Contract, by the Client or any other party is that party's risk and Fugro accepts no liability whatsoever for any such use and/or reliance.

Appendix B

Methodologies

B.1 Survey Methods

B.1.1 Intertidal Core Sampling

Sediment samples were acquired using a 11.2 cm diameter (0.01 m^2) stainless steel corer. Operational procedures for core sampling were as follows:

- At each required location, an area of undisturbed sediment was selected for sampling.
- A photograph of the sediment surface was taken prior to sampling.
- The corer was pushed into the sediment to a depth of 15 cm, where this depth could not be achieved, the sample depth was recorded.
- The sediment around the corer was removed and flat edge was placed under the bottom of the corer to remove the corer from the sediment.
- Records of the sediment type, including any layering, depth of anoxic layers, and conspicuous fauna were taken.
- Where possible, redox measurements were taken.
- The corer was then rinsed ready for the next sample.

B.1.1.1 Physico-chemical Sample Processing

- Redox readings were taken using a Hanna Redox probe;
- Sediment chemistry (SC) samples were collected using a metal scoop to a nominal depth of 2 cm. The samples were stored in 1 L amber glass jars and kept cool;
- PSD samples were collected using a plastic scoop to a nominal depth of 5 cm. The samples were stored in plastic pots and kept cool.

B.1.1.2 Macrofauna Sample Processing

Macrofauna core samples were processed as follows:

- Macrofauna core samples were transferred directly into containers labelled with the job number, station code and fauna code (e.g. FA) and fixed in 10 % buffered formal saline. The sample containers were then sealed, hazard labelled and stored securely.

B.1.2 Sediment Grab Sampling

Faunal and particle size distribution (PSD) samples were acquired using a 0.1 m^2 mini Hamon grab. Chemistry samples were acquired using a 0.1 m^2 Day grab.

Operational procedures for grab sampling were as follows:

- The grab was prepared for operations prior to arrival on station. The Bridge communicated to the deck via a VHF radio when the vessel was steady and on location, and the grab was deployed from the stern A-frame;
- When the engineer operating the winch observed that the grab had reached the seabed (evidenced through a distinct slackening of the wire rope and snatch block), the environmental surveyor was informed (via VHF radio) and a fix was taken;

- On recovery to the deck, the sample was inspected and judged acceptable or otherwise (see below for rejection criteria);
- One accepted grab sample was retained for faunal analysis and PSD and another grab sample was subsampled for PC analysis;
- Deck logs were completed for each sample acquired (including no samples) with date, time, sample number, fix number, sediment type, depth and colour of strata in the sediment (if any), odour (i.e. H_2S), bioturbation or debris.

Samples were considered unacceptable in the following instances:

- Evidence of sediment washout caused through improperly closed grab jaws or inspection hatch;
- Sediment sample taken on an angle; where the grab jaws have not been parallel to the seabed when the grab fired;
- Disruption of the sample through striking the side of the vessel;
- Sample too small for requirements. Sample represented less than approximately 5 cm bite depth of the dual van Veen grab or Day grab, minimum sample size for 0.1 m^2 Hamon grab;
- Deemed unacceptable by the client representative for any other reason.

B.1.2.1 Physico-chemical Sample Processing

- Particle size distribution (PSD) samples were collected using a plastic scoop and subsampled from the faunal sample obtained by the mini Hamon grab.
- Hydrocarbon samples were collected using a metal scoop to a nominal depth of 2 cm. The samples were preserved in glass jars at approximately −20 ºC;
- Heavy metal samples were collected using a plastic scoop to a nominal depth of 2 cm. The samples were preserved in polythene bags at approximately −20 ºC;

B.1.2.2 Macrofauna Sample Processing

Macrofauna samples were processed as follows:

- Macrofauna samples were processed in their entirety, by opening the spades to drop the grab into a container. All supernatant water was processed along with the sediment;
- The sample was transferred to a chute and stand and washed through a 1.0 mm mesh sieve;
- Once sieved samples were transferred to containers labelled with the job number, station code and fauna code (e.g., FA) and fixed in 10 % buffered formal saline. The sample containers were then sealed, hazard labelled and stored securely on deck.

Appendix C

Logs

C.1 Intertidal Survey Log

Geodetic Parameters: WGS 84, UTM Zone 31 North													
Date	Time [UTC]	Station	Waypoint	Sample Type	Easting [m]	Northing [m]	Sample Depth [cm]	Temperature [˚C]	Redox [mV]	Sediment Description	Stills	Conspicuous Fauna	Notes
25/07/2021	18:20:52	I_TR04_HW	I_TR04_HW	FA	377 713.4	5 741 803.7	15	-	-	Sand	5 stills	-	Sediment too dry for Hanna probe
25/07/2021	18:26:15	I_TR04_MW	I_TR04_MW	FA	377 727.1	5 741 797.4	15	20.2	210	Sand, some gravel	4 stills	-	-
25/07/2021	18:32:24	I_TR04_LW	I_TR04_LW	FA	377 752.6	5 741 778.2	15	20.3	123	Sand, patches and streaks of anoxia at > 10 cm depth	3 stills	-	-
25/07/2021	18:48:06	I_TR05_HW	I_TR05_HW	FA	377 994.7	5 742 059.3	15	-	-	Sand, gravel below 15 cm	4 stills	-	Sediment too dry for Hanna probe
25/07/2021	18:52:09	I_TR05_MW	I_TR05_MW	FA	378 003.1	5 742 048.5	15	20.0	−89	Sand, gravel	4 stills	-	-
25/07/2021	18:57:01	I_TR05_LW	I_TR05_LW	FA	378 019.6	5 742 023.7	15	19.7	73	Sand	3 stills	*Lanice conchilega*	-
25/07/2021	19:12:35	I_TR06_MW	I_TR06_MW	FA	378 331.8	5 742 291.9	15	-	-	Sand	4 stills	-	Sediment too dry for Hanna probe
25/07/2021	19:16:41	I_TR06_LW	I_TR06_LW	FA	378 344.6	5 742 273.2	15	19.7	-35	Fine sand, streaks of anoxia > 10 cm depth	2 stills	-	-
25/07/2021	19:31:32	I_TR07_HW	I_TR07_HW	FA	378 474.3	5 742 464.3	10	-	-	Sand, gravel	4 stills	-	Sediment too dry for Hanna probe
25/07/2021	19:36:53	I_TR07_MW	I_TR07_MW	FA	378 490.7	5 742 452.2	15	19.4	199.0	Sand, gravel > 15 cm depth	2 stills	-	-
25/07/2021	19:41:54	I_TR07_LW	I_TR07_LW	FA	378 520.9	5 742 420.5	15	19.1	−15.0	Sand, very small anoxic streaks throughout	2 stills	-	-
26/07/2021	06:23:28	I_TR07_HW	PSD_TR07_HW	PSD	378 474.7	5 742 463.4	-	-	-	Coarse sand	-	-	-
26/07/2021	06:25:16	I_TR07_MW	PSD_TR07_MW	PSD	378 490.1	5 742 450.7	-	-	-	Sand	-	-	-
26/07/2021	06:36:14	I_TR06_MW	PSD_TR06_MW	PSD	378 331.8	5 742 292.5	-	-	-	Sand	-	-	-
26/07/2021	06:50:42	I_TR08_HW	I_TR08_HW	FA, PSD	378 754.7	5 742 763.8	10	-	-	Sand, gravel	4 stills	-	Sediment too dry for Hanna probe
26/07/2021	06:56:26	I_TR08_MW	I_TR08_MW	FA, PSD	378 770.7	5 742 748.7	15	18.7	-2	Sand	2 stills	-	-
26/07/2021	07:02:50	I_TR08_LW	I_TR08_LW	FA, PSD	378 799.9	5 742 723.6	15	19.3	−56	Sand, streaks of anoxia > 10 cm depth, layer of anoxia at 15 cm depth	2 stills	-	-
26/07/2021	08:11:10	I_TR03_HW	I_TR03_HW	FA, PSD	377 353.3	5 741 586.6	10	-	-	Sand, gravel	4 stills	-	Sediment too dry for Hanna probe
26/07/2021	08:16:04	I_TR03_MW	I_TR03_MW	FA, PSD	377 363.0	5 741 570.8	10	-	-	Sand, gravel	4 stills	-	Sediment too dry for Hanna probe
26/07/2021	08:31:30	I_TR02_HW	I_TR02_HW	FA, PSD	377 061.1	5 741 306.0	15	-	-	Sand, gravel	4 stills	-	Sediment too dry for Hanna probe
26/07/2021	08:36:50	I_TR02_MW	I_TR02_MW	FA, PSD	377 074.6	5 741 288.8	12	-	-	Sand, gravel	3 stills	-	Sediment too dry for Hanna probe
26/07/2021	08:49:16	I_TR01_HW	I_TR01_HW	FA, PSD	376 916.0	5 741 227.5	15	-	-	Sand, small amount of gravel	3 stills	-	Sediment too dry for Hanna probe
26/07/2021	08:53:42	I_TR01_MW	I_TR01_MW	FA, PSD	376 924.0	5 741 210.8	15	-	-	Sand, gravel	4 stills	-	Sediment too dry for Hanna probe
26/07/2021	18:23:24	I_TR04_HW	PSD_TR04_HW	PSD	377 713.2	5 741 804.7	-	-	-	Sand	-	-	-
26/07/2021	18:24:58	I_TR04_MW	PSD_TR04_MW	PSD	377 727.3	5 741 797.8	-	-	-	Sand	-	-	-
26/07/2021	18:43:26	I_TR04_LW	PSD_TR04_LW	PSD	377 748.1	5 741 785.4	-	-	-	Sand	-	-	-
26/07/2021	18:51:30	I_TR05_HW	PSD_SC_TR05_HW	PSD and SC	377 991.4	5 742 056.6	-	-	-	Sand	2 stills	-	-
26/07/2021	18:59:46	I_TR05_MW	PSD_SC_TR05_MW	PSD and SC	378 001.8	5 742 048.2	-	-	-	Sand	1 still	-	-
26/07/2021	19:07:16	I_TR05_LW	PSD_SC_TR05_LW	PSD and SC	378 018.8	5 742 026.5	-	-	-	Sand	1 still	-	-
26/07/2021	19:21:57	I_TR06_LW	PSD_TR06_LW	PSD	378 335.2	5 742 271.4	-	-	-	Sand	-	-	-

Geodetic Parameters: WGS 84, UTM Zone 31 North													
Date	Time [UTC]	Station	Waypoint	Sample Type	Easting [m]	Northing [m]	Sample Depth [cm]	Temperature [˚C]	Redox [mV]	Sediment Description	Stills	Conspicuous Fauna	Notes
26/07/2021	19:27:50	I_TR07_LW	PSD_TR07_LW	PSD	378 516.3	5 742 417.9	-	-	-	Sand	-	-	-
26/07/2021	20:22:29	I_TR01_LW	I_TR01_LW	FA, PSD	376 938.9	5 741 185.4	15	18.7	32	Sand, anoxic streaks at 15 cm depth	3 stills	*Lanice conchilega*	-
27/07/2021	07:12:56	I_TR03_LW	TN_TR03_01	TN	377 382.7	5 741 552.1	-	-	-	Boulders	2 stills	-	Overview of *F. serratus* on boulders looking out to sea. Plus one image of close up of algae sampled
27/07/2021	07:15:15	I_TR03_LW	TN_TR03_02	TN	377 374.5	5 741 547.4	-	-	-	Boulders	1 still	-	Overview of *F. serratus* on boulders looking north-east
27/07/2021	07:21:03	I_TR03_LW	I_TR03_LW	FA, PSD	377 374.1	5 741 547.5	15	19.0	84	Sand, streaks of anoxia > 12 cm depth	2 stills	-	Raining when sample taken

Notes
FA = Faunal sample A
HW = High water
LW = Low water
MW = Mid water
PSD = Particle size distribution sample
SC = Sediment chemistry sample
TN = Target note
UTC = Coordinated Universal Time

C.2 Subtidal Survey Log

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
09/11/2021	01:08:23	FE5_01	HG	FA	3	-	410 739.0	5 744 398.9	410 746.6	5 744 408.1	11.9
09/11/2021	02:14:02	FE5_02	HG	NS	4	30	411 906.0	5 743 421.0	411 907.3	5 743 441.5	20.5
09/11/2021	02:39:31	FE5_02	HG	NS	5	30	411 906.0	5 743 421.0	411 922.5	5 743 433.9	20.9
09/11/2021	07:21:05	FE5_02	HG	NS	7	30	411 906.0	5 743 421.0	411 904.6	5 743 419.3	2.2
09/11/2021	07:45:22	FE5_02	HG	NS	8	30	411 906.0	5 743 421.0	411 913.9	5 743 410.4	13.2
09/11/2021	08:02:06	FE5_02	HG	FA	9	30	411 906.0	5 743 421.0	411 912.2	5 743 423.5	6.7
09/11/2021	08:29:45	FE5_03	HG	FA	10	26	412 839.0	5 742 381.0	412 846.6	5 742 397.9	18.5
09/11/2021	09:16:42	FE5_04	HG	FA	11	34	413 827.5	5 741 203.2	413 826.3	5 741 184.3	18.9
09/11/2021	09:41:08	FE5_05	HG	FA	12	40	414 453.9	5 739 853.3	414 455.6	5 739 845.1	8.4
09/11/2021	10:31:01	FE5_06	HG	FA	13	36	414 947.4	5 738 480.2	414 949.9	5 738 472.5	8.1
09/11/2021	11:01:10	FE5_07	HG	FA	15	24	416 360.4	5 737 761.0	416 356.7	5 737 746.5	15.0
09/11/2021	11:55:31	FE5_08	HG	FA	17	40	417 654.0	5 737 551.0	417 652.6	5 737 558.3	7.5
09/11/2021	13:09:20	FE5_09	HG	FA	18	40	419 142.9	5 737 800.3	419 128.1	5 737 791.1	17.5
09/11/2021	13:51:39	FE5_09	DG	SC	19	39	419 142.9	5 737 800.3	419 137.7	5 737 815.1	15.7
09/11/2021	14:30:45	FE4_02	DG	NT	20	32	423 692.0	5 739 131.0	423 717.6	5 739 158.2	37.3
09/11/2021	14:42:32	FE4_02	DG	NS	21	32	423 692.0	5 739 131.0	423 693.0	5 739 130.2	1.2
09/11/2021	14:57:22	FE4_02	DG	NS	22	32	423 692.0	5 739 131.0	423 697.8	5 739 144.3	14.5
09/11/2021	15:10:06	FE4_02	DG	NS	23	32	423 692.0	5 739 131.0	423 704.3	5 739 142.4	16.7
09/11/2021	15:47:57	FE4_02_50 m	DG	SC	24	32	423 692.0	5 739 131.0	423 735.0	5 739 129.6	43.1
09/11/2021	16:33:30	FE4_05	DG	SC	25	-	428 550.0	5 741 277.0	428 556.3	5 741 245.1	32.5

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
09/11/2021	19:04:11	FE5_10	HG	FA	26	29	420 438.0	5 737 564.0	420 459.5	5 737 566.0	21.6
09/11/2021	19:38:21	FE4_01	HG	NS	27	25	422 088.0	5 738 358.0	422 082.4	5 738 361.8	6.8
09/11/2021	20:14:47	FE4_01	HG	FA	28	25	422 088.0	5 738 358.0	422 078.8	5 738 359.0	9.3
09/11/2021	20:48:16	FE4_02	HG	FA	29	29	423 692.0	5 739 131.0	423 674.4	5 739 131.5	17.6
09/11/2021	21:35:16	FE4_03	HG	FA	30	26	425 301.0	5 739 840.0	425 320.9	5 739 835.5	20.4
09/11/2021	22:37:46	FE4_04	HG	FA	31	25	426 929.0	5 740 543.0	426 917.3	5 740 541.2	11.8
09/11/2021	23:12:31	FE4_05	HG	FA	32	25	428 550.0	5 741 277.0	428 539.4	5 741 265.1	15.9
09/11/2021	23:40:14	FE4_06	HG	FA	33	20	430 202.0	5 742 064.0	430 185.9	5 742 055.0	18.4
10/11/2021	00:04:52	FE4_07	HG	NS	34	28	431 465.0	5 742 299.0	431 455.4	5 742 290.7	12.7
10/11/2021	00:18:12	FE4_07	HG	FA	35	28	431 465.0	5 742 299.0	431 471.9	5 742 290.5	10.9
10/11/2021	01:16:13	FE4_08	HG	FA	36	30	433 566.5	5 743 146.2	433 573.9	5 743 137.9	11.2
11/11/2021	05:27:50	FE4_08	Video	SOL	146	30	433 566.5	5 743 146.2	433 571.0	5 743 180.7	34.7
11/11/2021	05:28:02	FE4_08	Still	FE4_08_01	147	-	433 566.5	5 743 146.2	433 568.1	5 743 176.2	30.1
11/11/2021	05:28:10	FE4_08	Still	FE4_08_02	148	-	433 566.5	5 743 146.2	433 565.4	5 743 173.8	27.6
11/11/2021	05:28:15	FE4_08	Still	FE4_08_03	149	-	433 566.5	5 743 146.2	433 563.4	5 743 172.2	26.2
11/11/2021	05:28:21	FE4_08	Still	FE4_08_04	150	-	433 566.5	5 743 146.2	433 561.8	5 743 170.1	24.3
11/11/2021	05:28:24	FE4_08	Still	FE4_08_05	151	-	433 566.5	5 743 146.2	433 561.0	5 743 169.1	23.5
11/11/2021	05:28:28	FE4_08	Still	FE4_08_06	152	-	433 566.5	5 743 146.2	433 559.8	5 743 167.7	22.5
11/11/2021	05:28:34	FE4_08	Still	FE4_08_07	153	-	433 566.5	5 743 146.2	433 558.8	5 743 165.2	20.5
11/11/2021	05:28:36	FE4_08	Still	FE4_08_08	154	-	433 566.5	5 743 146.2	433 558.4	5 743 164.4	20.0
11/11/2021	05:28:42	FE4_08	Still	FE4_08_09	155	-	433 566.5	5 743 146.2	433 557.7	5 743 161.4	17.6

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	05:28:47	FE4_08	Still	FE4_08_10	156	-	433 566.5	5 743 146.2	433 555.9	5 743 160.4	17.7
11/11/2021	05:28:49	FE4_08	Still	FE4_08_11	157	-	433 566.5	5 743 146.2	433 554.9	5 743 159.9	18.0
11/11/2021	05:28:54	FE4_08	Still	FE4_08_12	158	-	433 566.5	5 743 146.2	433 552.4	5 743 158.8	18.9
11/11/2021	05:28:58	FE4_08	Still	FE4_08_13	159	-	433 566.5	5 743 146.2	433 551.0	5 743 157.6	19.3
11/11/2021	05:29:07	FE4_08	Still	FE4_08_14	160	-	433 566.5	5 743 146.2	433 548.7	5 743 154.2	19.5
11/11/2021	05:29:13	FE4_08	Still	FE4_08_15	161	-	433 566.5	5 743 146.2	433 548.8	5 743 151.4	18.4
11/11/2021	05:29:19	FE4_08	Still	FE4_08_16	162	-	433 566.5	5 743 146.2	433 549.4	5 743 148.5	17.2
11/11/2021	05:29:34	FE4_08	Still	FE4_08_17	163	-	433 566.5	5 743 146.2	433 551.8	5 743 140.9	15.7
11/11/2021	05:29:38	FE4_08	Still	FE4_08_18	164	-	433 566.5	5 743 146.2	433 552.0	5 743 139.1	16.2
11/11/2021	05:29:48	FE4_08	Still	FE4_08_19	165	-	433 566.5	5 743 146.2	433 550.9	5 743 135.1	19.2
11/11/2021	05:29:52	FE4_08	Still	FE4_08_20	166	-	433 566.5	5 743 146.2	433 550.8	5 743 133.3	20.3
11/11/2021	05:29:55	FE4_08	Still	FE4_08_21	167	-	433 566.5	5 743 146.2	433 550.7	5 743 132.1	21.2
11/11/2021	05:30:00	FE4_08	Still	FE4_08_22	168	-	433 566.5	5 743 146.2	433 550.7	5 743 129.8	22.8
11/11/2021	05:30:08	FE4_08	Still	FE4_08_23	169	-	433 566.5	5 743 146.2	433 551.3	5 743 125.6	25.6
11/11/2021	05:30:12	FE4_08	Still	FE4_08_24	170	-	433 566.5	5 743 146.2	433 551.5	5 743 124.2	26.6
11/11/2021	05:30:16	FE4_08	Still	FE4_08_25	171	-	433 566.5	5 743 146.2	433 551.3	5 743 122.0	28.5
11/11/2021	05:30:21	FE4_08	Video	EOL	172	-	433 566.5	5 743 146.2	433 551.2	5 743 120.2	30.2
11/11/2021	06:02:06	FE4_08a	Video	SOL	173	30	433 566.5	5 743 146.2	433 581.9	5 743 169.2	27.7
11/11/2021	06:02:47	FE4_08a	Still	FE4_08a_01	174	-	433 566.5	5 743 146.2	433 567.5	5 743 158.1	11.9
11/11/2021	06:03:00	FE4_08a	Still	FE4_08a_02	175	-	433 566.5	5 743 146.2	433 562.4	5 743 156.6	11.2
11/11/2021	06:03:06	FE4_08a	Still	FE4_08a_03	176	-	433 566.5	5 743 146.2	433 560.4	5 743 155.1	10.8

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	06:03:37	FE4_08a	Still	FE4_08a_04	179	-	433 566.5	5 743 146.2	433 551.9	5 743 149.4	14.9
11/11/2021	06:03:44	FE4_08a	Still	FE4_08a_05	180	-	433 566.5	5 743 146.2	433 550.0	5 743 148.1	16.6
11/11/2021	06:03:50	FE4_08a	Still	FE4_08a_06	181	-	433 566.5	5 743 146.2	433 548.3	5 743 147.0	18.2
11/11/2021	06:03:56	FE4_08a	Still	FE4_08a_07	182	-	433 566.5	5 743 146.2	433 546.6	5 743 145.9	19.9
11/11/2021	06:04:03	FE4_08a	Still	FE4_08a_08	183	-	433 566.5	5 743 146.2	433 544.3	5 743 144.8	22.2
11/11/2021	06:04:17	FE4_08a	Still	FE4_08a_09	185	-	433 566.5	5 743 146.2	433 540.2	5 743 142.2	26.6
11/11/2021	06:04:21	FE4_08a	Still	FE4_08a_10	186	-	433 566.5	5 743 146.2	433 539.2	5 743 141.3	27.7
11/11/2021	06:04:24	FE4_08a	Still	FE4_08a_11	187	-	433 566.5	5 743 146.2	433 538.3	5 743 140.7	28.7
11/11/2021	06:04:29	FE4_08a	Still	FE4_08a_12	188	-	433 566.5	5 743 146.2	433 537.0	5 743 139.8	30.2
11/11/2021	06:04:29	FE4_08a	Still	FE4_08a_13	189	-	433 566.5	5 743 146.2	433 537.0	5 743 139.8	30.2
11/11/2021	06:04:38	FE4_08a	Still	FE4_08a_14	190	-	433 566.5	5 743 146.2	433 534.3	5 743 137.7	33.3
11/11/2021	06:04:45	FE4_08a	Still	FE4_08a_15	191	-	433 566.5	5 743 146.2	433 532.3	5 743 136.9	35.4
11/11/2021	06:04:54	FE4_08a	Still	FE4_08a_16	192	-	433 566.5	5 743 146.2	433 529.2	5 743 135.8	38.7
11/11/2021	06:04:59	FE4_08a	Video	EOL	193	-	433 566.5	5 743 146.2	433 527.8	5 743 134.6	40.4
11/11/2021	08:23:11	FE4_05	Video	SOL	195	15	428 550.0	5 741 277.0	428 559.9	5 741 295.4	20.8
11/11/2021	08:23:26	FE4_05	Still	no photo	196	-	428 550.0	5 741 277.0	428 559.6	5 741 294.1	19.6
11/11/2021	08:23:50	FE4_05	Still	FE4_05_00	197	-	428 550.0	5 741 277.0	428 560.9	5 741 292.0	18.5
11/11/2021	08:24:06	FE4_05	Still	FE4_05_01	198	-	428 550.0	5 741 277.0	428 564.2	5 741 287.3	17.6
11/11/2021	08:24:19	FE4_05	Still	no photo	199	-	428 550.0	5 741 277.0	428 562.3	5 741 285.0	14.7
11/11/2021	08:24:29	FE4_05	Still	FE4_05_02	200	-	428 550.0	5 741 277.0	428 559.3	5 741 283.5	11.3
11/11/2021	08:24:42	FE4_05	Still	FE4_05_03	201	-	428 550.0	5 741 277.0	428 557.0	5 741 280.0	7.6

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	08:24:58	FE4_05	Still	FE4_05_04	202	-	428 550.0	5 741 277.0	428 556.5	5 741 273.5	7.3
11/11/2021	08:25:04	FE4_05	Still	FE4_05_05	203	-	428 550.0	5 741 277.0	428 556.3	5 741 270.9	8.8
11/11/2021	08:25:11	FE4_05	Still	FE4_05_06	204	-	428 550.0	5 741 277.0	428 554.7	5 741 268.9	9.4
11/11/2021	08:25:20	FE4_05	Still	FE4_05_07	205	-	428 550.0	5 741 277.0	428 551.6	5 741 266.7	10.5
11/11/2021	08:25:28	FE4_05	Still	FE4_05_08	206	-	428 550.0	5 741 277.0	428 549.2	5 741 264.3	12.7
11/11/2021	08:25:33	FE4_05	Still	FE4_05_09	207	-	428 550.0	5 741 277.0	428 548.3	5 741 262.5	14.6
11/11/2021	08:25:41	FE4_05	Still	FE4_05_10	208	-	428 550.0	5 741 277.0	428 547.7	5 741 259.2	18.0
11/11/2021	08:25:48	FE4_05	Still	FE4_05_11	209	-	428 550.0	5 741 277.0	428 547.7	5 741 255.9	21.2
11/11/2021	08:25:55	FE4_05	Still	FE4_05_12	210	-	428 550.0	5 741 277.0	428 547.7	5 741 252.9	24.2
11/11/2021	08:26:02	FE4_05	Still	FE4_05_13	211	-	428 550.0	5 741 277.0	428 547.5	5 741 249.7	27.4
11/11/2021	08:26:09	FE4_05	Still	FE4_05_14	212	-	428 550.0	5 741 277.0	428 546.6	5 741 247.1	30.1
11/11/2021	08:26:19	FE4_05	Still	FE4_05_15	213	-	428 550.0	5 741 277.0	428 544.3	5 741 244.0	33.5
11/11/2021	08:26:23	FE4_05	Still	FE4_05_16	214	-	428 550.0	5 741 277.0	428 543.6	5 741 242.6	35.0
11/11/2021	08:26:31	FE4_05	Still	FE4_05_17	215	-	428 550.0	5 741 277.0	428 543.2	5 741 239.3	38.3
11/11/2021	08:26:37	FE4_05	Still	FE4_05_18	216	-	428 550.0	5 741 277.0	428 542.9	5 741 236.9	40.7
11/11/2021	08:26:46	FE4_05	Video	EOL	217	-	428 550.0	5 741 277.0	428 542.2	5 741 233.2	44.5
11/11/2021	09:12:16	FE4_04	Video	SOL	218	14	426 929.0	5 740 543.0	426 928.5	5 740 559.0	16.0
11/11/2021	09:12:27	FE4_04	Still	FE4_04_00	219	-	426 929.0	5 740 543.0	426 928.2	5 740 555.7	12.7
11/11/2021	09:12:37	FE4_04	Still	FE4_04_01	220	-	426 929.0	5 740 543.0	426 929.3	5 740 552.7	9.7
11/11/2021	09:12:46	FE4_04	Still	FE4_04_02	221	-	426 929.0	5 740 543.0	426 931.4	5 740 549.6	7.0
11/11/2021	09:12:58	FE4_04	Still	FE4_04_03	222	-	426 929.0	5 740 543.0	426 934.6	5 740 544.4	5.8

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	09:13:03	FE4_04	Still	FE4_04_04	223	-	426 929.0	5 740 543.0	426 935.4	5 740 542.3	6.4
11/11/2021	09:13:09	FE4_04	Still	FE4_04_05	224	-	426 929.0	5 740 543.0	426 935.6	5 740 539.7	7.4
11/11/2021	09:13:17	FE4_04	Still	FE4_04_06	225	-	426 929.0	5 740 543.0	426 936.0	5 740 536.1	9.9
11/11/2021	09:13:25	FE4_04	Still	FE4_04_07	226	-	426 929.0	5 740 543.0	426 936.0	5 740 532.5	12.6
11/11/2021	09:13:34	FE4_04	Still	FE4_04_08	227	-	426 929.0	5 740 543.0	426 935.3	5 740 528.5	15.8
11/11/2021	09:13:43	FE4_04	Still	FE4_04_09	228	-	426 929.0	5 740 543.0	426 934.0	5 740 524.7	19.0
11/11/2021	09:13:51	FE4_04	Still	FE4_04_10	229	-	426 929.0	5 740 543.0	426 932.3	5 740 521.5	21.7
11/11/2021	09:13:56	FE4_04	Still	FE4_04_11	230	-	426 929.0	5 740 543.0	426 931.1	5 740 519.5	23.6
11/11/2021	09:14:00	FE4_04	Still	FE4_04_12	231	-	426 929.0	5 740 543.0	426 930.0	5 740 517.9	25.1
11/11/2021	09:14:10	FE4_04	Still	FE4_04_13	233	-	426 929.0	5 740 543.0	426 926.4	5 740 514.9	28.3
11/11/2021	09:14:16	FE4_04	Still	FE4_04_14	234	-	426 929.0	5 740 543.0	426 924.0	5 740 513.6	29.8
11/11/2021	09:14:19	FE4_04	Still	FE4_04_15	235	-	426 929.0	5 740 543.0	426 923.1	5 740 512.9	30.7
11/11/2021	09:14:22	FE4_04	Still	FE4_04_16	236	-	426 929.0	5 740 543.0	426 922.3	5 740 512.2	31.5
11/11/2021	09:14:26	FE4_04	Still	FE4_04_17	237	-	426 929.0	5 740 543.0	426 921.2	5 740 511.5	32.5
11/11/2021	09:14:45	FE4_04	Still	FE4_04_18	238	-	426 929.0	5 740 543.0	426 917.0	5 740 508.2	36.8
11/11/2021	09:14:53	FE4_04	Video	EOL	239	-	426 929.0	5 740 543.0	426 915.8	5 740 506.8	38.6
11/11/2021	09:51:10	FE4_03	Video	SOL	240	25	425 301.0	5 739 840.0	425 304.1	5 739 863.4	23.6
11/11/2021	09:51:18	FE4_03	Still	FE4_03_00	241	-	425 301.0	5 739 840.0	425 305.0	5 739 859.6	20.0
11/11/2021	09:51:22	FE4_03	Still	FE4_03_01	242	-	425 301.0	5 739 840.0	425 305.4	5 739 857.8	18.3
11/11/2021	09:51:26	FE4_03	Still	FE4_03_02	243	-	425 301.0	5 739 840.0	425 305.8	5 739 855.9	16.7
11/11/2021	09:51:35	FE4_03	Still	FE4_03_03	244	-	425 301.0	5 739 840.0	425 306.6	5 739 852.5	13.7

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	09:51:42	FE4_03	Still	FE4_03_04	245	-	425 301.0	5 739 840.0	425 306.8	5 739 850.7	12.2
11/11/2021	09:51:50	FE4_03	Still	FE4_03_05	246	-	425 301.0	5 739 840.0	425 306.8	5 739 849.3	11.0
11/11/2021	09:51:54	FE4_03	Still	FE4_03_06	247	-	425 301.0	5 739 840.0	425 306.7	5 739 848.9	10.6
11/11/2021	09:51:57	FE4_03	Still	FE4_03_07	248	-	425 301.0	5 739 840.0	425 306.8	5 739 848.6	10.4
11/11/2021	09:52:01	FE4_03	Still	FE4_03_08	249	-	425 301.0	5 739 840.0	425 307.4	5 739 848.0	10.2
11/11/2021	09:52:04	FE4_03	Still	FE4_03_09	250	-	425 301.0	5 739 840.0	425 308.1	5 739 847.5	10.3
11/11/2021	09:52:09	FE4_03	Still	FE4_03_10	251	-	425 301.0	5 739 840.0	425 309.6	5 739 846.4	10.7
11/11/2021	09:52:16	FE4_03	Still	FE4_03_11	252	-	425 301.0	5 739 840.0	425 314.3	5 739 843.7	13.8
11/11/2021	09:52:24	FE4_03	Still	FE4_03_12	253	-	425 301.0	5 739 840.0	425 318.8	5 739 839.8	17.8
11/11/2021	09:52:29	FE4_03	Still	FE4_03_13	254	-	425 301.0	5 739 840.0	425 320.4	5 739 837.6	19.5
11/11/2021	09:52:35	FE4_03	Still	FE4_03_14	255	-	425 301.0	5 739 840.0	425 321.9	5 739 834.6	21.6
11/11/2021	09:52:47	FE4_03	Still	FE4_03_15	256	-	425 301.0	5 739 840.0	425 320.4	5 739 829.1	22.2
11/11/2021	09:52:56	FE4_03	Still	FE4_03_16	257	-	425 301.0	5 739 840.0	425 316.4	5 739 825.7	21.0
11/11/2021	09:53:02	FE4_03	Still	FE4_03_17	258	-	425 301.0	5 739 840.0	425 312.9	5 739 823.1	20.7
11/11/2021	09:53:09	FE4_03	Still	FE4_03_18	259	-	425 301.0	5 739 840.0	425 309.2	5 739 819.5	22.0
11/11/2021	09:53:18	FE4_03	Still	FE4_03_19	260	-	425 301.0	5 739 840.0	425 305.3	5 739 813.7	26.6
11/11/2021	09:53:22	FE4_03	Still	FE4_03_20	261	-	425 301.0	5 739 840.0	425 303.2	5 739 811.6	28.5
11/11/2021	09:53:28	FE4_03	Still	FE4_03_21	262	-	425 301.0	5 739 840.0	425 299.9	5 739 808.4	31.7
11/11/2021	09:53:36	FE4_03	Still	FE4_03_22	263	-	425 301.0	5 739 840.0	425 294.6	5 739 804.9	35.7
11/11/2021	09:53:41	FE4_03	Video	EOL	264	-	425 301.0	5 739 840.0	425 290.8	5 739 803.5	37.9
11/11/2021	10:12:09	FE4_02	Video	SOL	265	28	423 692.0	5 739 131.0	423 696.1	5 739 158.2	27.5

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	10:12:32	FE4_02	Still	FE4_02_01	266	-	423 692.0	5 739 131.0	423 694.0	5 739 149.5	18.6
11/11/2021	10:12:39	FE4_02	Still	FE4_02_02	267	-	423 692.0	5 739 131.0	423 694.0	5 739 147.7	16.8
11/11/2021	10:12:54	FE4_02	Still	FE4_02_03	268	-	423 692.0	5 739 131.0	423 694.4	5 739 143.7	13.0
11/11/2021	10:13:15	FE4_02	Still	FE4_02_04	270	-	423 692.0	5 739 131.0	423 698.8	5 739 133.4	7.2
11/11/2021	10:13:23	FE4_02	Still	FE4_02_05	271	-	423 692.0	5 739 131.0	423 699.8	5 739 130.1	7.8
11/11/2021	10:13:26	FE4_02	Still	FE4_02_06	272	-	423 692.0	5 739 131.0	423 699.9	5 739 129.1	8.1
11/11/2021	10:13:32	FE4_02	Still	FE4_02_07	273	-	423 692.0	5 739 131.0	423 699.7	5 739 126.8	8.8
11/11/2021	10:13:39	FE4_02	Still	FE4_02_08	274	-	423 692.0	5 739 131.0	423 699.1	5 739 124.0	10.0
11/11/2021	10:13:46	FE4_02	Still	FE4_02_09	275	-	423 692.0	5 739 131.0	423 698.3	5 739 121.7	11.3
11/11/2021	10:13:54	FE4_02	Still	FE4_02_10	276	-	423 692.0	5 739 131.0	423 696.9	5 739 119.7	12.3
11/11/2021	10:14:03	FE4_02	Still	FE4_02_11	277	-	423 692.0	5 739 131.0	423 696.3	5 739 117.7	14.0
11/11/2021	10:14:07	FE4_02	Still	FE4_02_12	278	-	423 692.0	5 739 131.0	423 696.5	5 739 116.4	15.3
11/11/2021	10:14:16	FE4_02	Still	FE4_02_13	279	-	423 692.0	5 739 131.0	423 698.6	5 739 112.4	19.7
11/11/2021	10:14:22	FE4_02	Still	FE4_02_14	280	-	423 692.0	5 739 131.0	423 700.5	5 739 109.7	23.0
11/11/2021	10:14:29	FE4_02	Still	FE4_02_15	281	-	423 692.0	5 739 131.0	423 703.5	5 739 106.2	27.4
11/11/2021	10:14:35	FE4_02	Video	EOL	282	-	423 692.0	5 739 131.0	423 704.6	5 739 103.5	30.3
11/11/2021	10:35:43	FE4_01	Video	SOL	283	25	422 088.0	5 738 358.0	422 084.1	5 738 388.4	30.6
11/11/2021	10:35:54	FE4_01	Still	FE4_01_01	284	-	422 088.0	5 738 358.0	422 082.3	5 738 381.4	24.1
11/11/2021	10:36:01	FE4_01	Still	FE4_01_02	285	-	422 088.0	5 738 358.0	422 085.0	5 738 376.9	19.1
11/11/2021	10:36:09	FE4_01	Still	FE4_01_03	286	-	422 088.0	5 738 358.0	422 087.9	5 738 372.0	14.0
11/11/2021	10:36:14	FE4_01	Still	FE4_01_04	287	-	422 088.0	5 738 358.0	422 089.5	5 738 369.0	11.1

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	10:36:20	FE4_01	Still	FE4_01_05	289	-	422 088.0	5 738 358.0	422 090.4	5 738 365.0	7.4
11/11/2021	10:36:26	FE4_01	Still	FE4_01_06	290	-	422 088.0	5 738 358.0	422 090.8	5 738 360.9	4.0
11/11/2021	10:36:32	FE4_01	Still	FE4_01_07	291	-	422 088.0	5 738 358.0	422 090.4	5 738 356.6	2.8
11/11/2021	10:36:38	FE4_01	Still	FE4_01_08	292	-	422 088.0	5 738 358.0	422 089.2	5 738 352.4	5.8
11/11/2021	10:36:43	FE4_01	Still	FE4_01_09	293	-	422 088.0	5 738 358.0	422 087.3	5 738 349.1	8.9
11/11/2021	10:36:48	FE4_01	Still	FE4_01_10	294	-	422 088.0	5 738 358.0	422 084.9	5 738 346.0	12.4
11/11/2021	10:36:52	FE4_01	Still	FE4_01_11	295	-	422 088.0	5 738 358.0	422 083.2	5 738 343.2	15.6
11/11/2021	10:36:57	FE4_01	Still	FE4_01_12	296	-	422 088.0	5 738 358.0	422 081.0	5 738 339.7	19.6
11/11/2021	10:37:10	FE4_01	Still	FE4_01_13	297	-	422 088.0	5 738 358.0	422 077.7	5 738 329.4	30.4
11/11/2021	10:37:18	FE4_01	Still	FE4_01_14	298	-	422 088.0	5 738 358.0	422 076.1	5 738 322.8	37.1
11/11/2021	10:37:23	FE4_01	Video	EOL	299	-	422 088.0	5 738 358.0	422 074.9	5 738 318.7	41.4
11/11/2021	11:03:35	FE5_09	Video	SOL	300	35	419 142.9	5 737 800.3	419 169.8	5 737 820.2	33.4
11/11/2021	11:03:43	FE5_09	Still	FE5_09_01	301	-	419 142.9	5 737 800.3	419 165.8	5 737 819.1	29.6
11/11/2021	11:03:49	FE5_09	Still	FE5_09_02	302	-	419 142.9	5 737 800.3	419 162.9	5 737 818.8	27.2
11/11/2021	11:03:57	FE5_09	Still	FE5_09_03	303	-	419 142.9	5 737 800.3	419 159.3	5 737 818.1	24.2
11/11/2021	11:04:06	FE5_09	Still	FE5_09_04	304	-	419 142.9	5 737 800.3	419 155.7	5 737 817.8	21.6
11/11/2021	11:04:16	FE5_09	Still	FE5_09_05	305	-	419 142.9	5 737 800.3	419 151.8	5 737 817.2	19.1
11/11/2021	11:04:23	FE5_09	Still	FE5_09_06	306	-	419 142.9	5 737 800.3	419 149.7	5 737 816.5	17.6
11/11/2021	11:04:30	FE5_09	Still	FE5_09_07	307	-	419 142.9	5 737 800.3	419 147.1	5 737 816.3	16.6
11/11/2021	11:04:40	FE5_09	Still	FE5_09_08	308	-	419 142.9	5 737 800.3	419 146.2	5 737 813.9	14.0
11/11/2021	11:04:52	FE5_09	Still	FE5_09_09	309	-	419 142.9	5 737 800.3	419 147.7	5 737 808.4	9.4

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	11:05:01	FE5_09	Still	FE5_09_10	310	-	419 142.9	5 737 800.3	419 149.9	5 737 802.6	7.4
11/11/2021	11:05:10	FE5_09	Still	FE5_09_11	311	-	419 142.9	5 737 800.3	419 149.7	5 737 797.8	7.3
11/11/2021	11:05:18	FE5_09	Still	FE5_09_12	312	-	419 142.9	5 737 800.3	419 148.2	5 737 794.0	8.3
11/11/2021	11:05:26	FE5_09	Still	FE5_09_13	313	-	419 142.9	5 737 800.3	419 145.9	5 737 790.5	10.2
11/11/2021	11:05:34	FE5_09	Still	FE5_09_14	314	-	419 142.9	5 737 800.3	419 141.2	5 737 788.8	11.6
11/11/2021	11:05:41	FE5_09	Still	FE5_09_15	315	-	419 142.9	5 737 800.3	419 135.4	5 737 788.2	14.2
11/11/2021	11:05:49	FE5_09	Still	FE5_09_16	316	-	419 142.9	5 737 800.3	419 129.2	5 737 786.5	19.5
11/11/2021	11:06:24	FE5_09	Video	EOL	317	-	419 142.9	5 737 800.3	419 113.7	5 737 775.7	38.2
11/11/2021	11:17:19	FE5_09a	Video	SOL	318	35	419 142.9	5 737 800.3	419 135.2	5 737 771.7	29.6
11/11/2021	11:17:31	FE5_09a	Still	FE5_09a_01	319	-	419 142.9	5 737 800.3	419 132.6	5 737 780.2	22.6
11/11/2021	11:17:34	FE5_09a	Still	FE5_09a_02	320	-	419 142.9	5 737 800.3	419 132.0	5 737 782.5	20.9
11/11/2021	11:17:38	FE5_09a	Still	FE5_09a_03	321	-	419 142.9	5 737 800.3	419 131.8	5 737 785.4	18.6
11/11/2021	11:17:42	FE5_09a	Still	FE5_09a_04	322	-	419 142.9	5 737 800.3	419 132.0	5 737 788.2	16.3
11/11/2021	11:17:46	FE5_09a	Still	FE5_09a_05	323	-	419 142.9	5 737 800.3	419 132.6	5 737 790.9	14.0
11/11/2021	11:17:50	FE5_09a	Still	FE5_09a_06	324	-	419 142.9	5 737 800.3	419 134.3	5 737 792.8	11.4
11/11/2021	11:17:56	FE5_09a	Still	FE5_09a_07	325	-	419 142.9	5 737 800.3	419 138.4	5 737 795.1	6.9
11/11/2021	11:18:03	FE5_09a	Still	FE5_09a_08	326	-	419 142.9	5 737 800.3	419 143.2	5 737 797.5	2.8
11/11/2021	11:18:09	FE5_09a	Still	FE5_09a_09	327	-	419 142.9	5 737 800.3	419 146.4	5 737 799.8	3.5
11/11/2021	11:18:16	FE5_09a	Still	FE5_09a_10	328	-	419 142.9	5 737 800.3	419 149.4	5 737 802.2	6.7
11/11/2021	11:18:24	FE5_09a	Still	FE5_09a_11	329	-	419 142.9	5 737 800.3	419 152.4	5 737 804.7	10.5
11/11/2021	11:18:31	FE5_09a	Still	FE5_09a_12	330	-	419 142.9	5 737 800.3	419 154.3	5 737 806.6	13.0

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	11:18:37	FE5_09a	Still	FE5_09a_13	331	-	419 142.9	5 737 800.3	419 155.6	5 737 808.2	15.0
11/11/2021	11:18:45	FE5_09a	Still	FE5_09a_14	332	-	419 142.9	5 737 800.3	419 156.8	5 737 810.1	17.0
11/11/2021	11:18:53	FE5_09a	Still	FE5_09a_15	333	-	419 142.9	5 737 800.3	419 158.3	5 737 811.7	19.1
11/11/2021	11:19:01	FE5_09a	Still	FE5_09a_16	334	-	419 142.9	5 737 800.3	419 160.3	5 737 813.1	21.5
11/11/2021	11:19:09	FE5_09a	Still	FE5_09a_17	335	-	419 142.9	5 737 800.3	419 162.0	5 737 814.4	23.7
11/11/2021	11:19:18	FE5_09a	Still	FE5_09a_18	336	-	419 142.9	5 737 800.3	419 164.0	5 737 815.8	26.1
11/11/2021	11:19:27	FE5_09a	Video	EOL	337	-	419 142.9	5 737 800.3	419 165.6	5 737 817.0	28.2
11/11/2021	12:41:01	FE5_01	Video	SOL	339	29	410 739.0	5 744 398.9	410 738.5	5 744 409.2	10.3
11/11/2021	12:43:12	FE5_01	Video	EOL	342	-	410 739.0	5 744 398.9	410 705.4	5 744 319.7	86.1
11/11/2021	13:08:17	FE5_01a	Video	SOL	343	28	410 739.0	5 744 398.9	410 699.9	5 744 330.9	78.4
11/11/2021	13:10:27	FE5_01a	Video	EOL	344	-	410 739.0	5 744 398.9	410 728.9	5 744 373.6	27.3
11/11/2021	14:50:53	FE5_01b	Video	SOL	345	28	410 739.0	5 744 398.9	410 720.0	5 744 373.0	32.1
11/11/2021	14:51:42	FE5_01b	Still	FE5_01b_01	346	-	410 739.0	5 744 398.9	410 721.6	5 744 396.7	17.5
11/11/2021	14:51:56	FE5_01b	Still	FE5_01b_02	347	-	410 739.0	5 744 398.9	410 721.8	5 744 404.0	17.9
11/11/2021	14:53:16	FE5_01b	Video	EOL	349	-	410 739.0	5 744 398.9	410 731.6	5 744 441.3	43.1
11/11/2021	15:13:47	FE5_01c	Video	SOL	350	28	410 739.0	5 744 398.9	410 732.0	5 744 358.7	40.8
11/11/2021	15:14:20	FE5_01c	Still	FE5_01c_01	351	-	410 739.0	5 744 398.9	410 731.5	5 744 364.5	35.2
11/11/2021	15:14:36	FE5_01c	Still	FE5_01c_02	352	-	410 739.0	5 744 398.9	410 726.3	5 744 367.2	34.1
11/11/2021	15:14:56	FE5_01c	Still	FE5_01c_03	353	-	410 739.0	5 744 398.9	410 716.7	5 744 372.5	34.6
11/11/2021	15:14:56	FE5_01c	Still	FE5_01c_04	354	-	410 739.0	5 744 398.9	410 716.7	5 744 372.5	34.6
11/11/2021	15:15:21	FE5_01c	Still	FE5_01c_05	355	-	410 739.0	5 744 398.9	410 713.5	5 744 379.7	31.9

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	15:15:43	FE5_01c	Still	FE5_01c_06	356	-	410 739.0	5 744 398.9	410 715.8	5 744 385.1	26.9
11/11/2021	15:16:09	FE5_01c	Still	FE5_01c_07	357	-	410 739.0	5 744 398.9	410 715.2	5 744 391.5	25.0
11/11/2021	15:16:29	FE5_01c	Still	FE5_01c_08	358	-	410 739.0	5 744 398.9	410 712.1	5 744 397.1	27.0
11/11/2021	15:16:43	FE5_01c	Video	EOL	359	-	410 739.0	5 744 398.9	410 711.0	5 744 399.9	28.0
11/11/2021	16:59:29	FE7f_02	Video	SOL	360	9	395 936.0	5 750 566.0	395 958.6	5 750 563.6	22.8
11/11/2021	16:59:56	FE7f_02	Still	FE7f_02_01	361	-	395 936.0	5 750 566.0	395 933.5	5 750 551.5	14.8
11/11/2021	17:00:04	FE7f_02	Still	FE7f_02_02	362	-	395 936.0	5 750 566.0	395 926.0	5 750 548.0	20.6
11/11/2021	17:00:12	FE7f_02	Still	FE7f_02_03	363	-	395 936.0	5 750 566.0	395 918.2	5 750 545.3	27.3
11/11/2021	17:00:18	FE7f_02	Still	FE7f_02_04	364	-	395 936.0	5 750 566.0	395 911.9	5 750 544.1	32.6
11/11/2021	17:00:38	FE7f_02	Video	EOL	366	-	395 936.0	5 750 566.0	395 890.0	5 750 541.8	52.0
11/11/2021	17:24:04	FE7e_03a	Video	SOL	367	11	393 756.8	5 749 639.0	393 775.9	5 749 662.1	30.0
11/11/2021	17:24:26	FE7e_03a	Still	FE7e_03a_01	368	-	393 756.8	5 749 639.0	393 769.4	5 749 650.6	17.1
11/11/2021	17:24:42	FE7e_03a	Still	FE7e_03a_02	369	-	393 756.8	5 749 639.0	393 763.8	5 749 644.0	8.6
11/11/2021	17:24:53	FE7e_03a	Still	FE7e_03a_03	370	-	393 756.8	5 749 639.0	393 761.1	5 749 641.1	4.8
11/11/2021	17:25:05	FE7e_03a	Still	FE7e_03a_04	371	-	393 756.8	5 749 639.0	393 758.7	5 749 638.3	2.0
11/11/2021	17:25:20	FE7e_03a	Still	FE7e_03a_05	372	-	393 756.8	5 749 639.0	393 756.1	5 749 634.9	4.2
11/11/2021	17:25:33	FE7e_03a	Still	FE7e_03a_06	373	-	393 756.8	5 749 639.0	393 753.6	5 749 632.7	7.1
11/11/2021	17:25:45	FE7e_03a	Still	FE7e_03a_07	374	-	393 756.8	5 749 639.0	393 751.0	5 749 631.4	9.6
11/11/2021	17:25:59	FE7e_03a	Still	FE7e_03a_08	375	-	393 756.8	5 749 639.0	393 747.8	5 749 630.0	12.7
11/11/2021	17:26:09	FE7e_03a	Still	FE7e_03a_09	376	-	393 756.8	5 749 639.0	393 746.0	5 749 628.7	14.9
11/11/2021	17:26:20	FE7e_03a	Still	FE7e_03a_10	377	-	393 756.8	5 749 639.0	393 743.0	5 749 626.6	18.6

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	17:26:31	FE7e_03a	Still	FE7e_03a_11	378	-	393 756.8	5 749 639.0	393 739.4	5 749 623.8	23.1
11/11/2021	17:26:45	FE7e_03a	Still	FE7e_03a_12	379	-	393 756.8	5 749 639.0	393 735.6	5 749 619.5	28.8
11/11/2021	17:27:00	FE7e_03a	Still	FE7e_03a_13	380	-	393 756.8	5 749 639.0	393 732.8	5 749 615.7	33.5
11/11/2021	17:27:08	FE7e_03a	Video	EOL	381	-	393 756.8	5 749 639.0	393 731.2	5 749 614.3	35.6
11/11/2021	17:48:45	FE7e_01a	Video	SOL	382	13	392 894.4	5 748 177.1	392 909.0	5 748 203.1	29.8
11/11/2021	17:49:00	FE7e_01a	Still	FE7e_01a_01	383	-	392 894.4	5 748 177.1	392 904.6	5 748 194.5	20.2
11/11/2021	17:49:22	FE7e_01a	Still	FE7e_01a_02	384	-	392 894.4	5 748 177.1	392 898.6	5 748 183.4	7.6
11/11/2021	17:49:30	FE7e_01a	Still	FE7e_01a_03	385	-	392 894.4	5 748 177.1	392 896.5	5 748 179.9	3.5
11/11/2021	17:49:46	FE7e_01a	Still	FE7e_01a_04	386	-	392 894.4	5 748 177.1	392 892.7	5 748 172.2	5.2
11/11/2021	17:49:57	FE7e_01a	Still	FE7e_01a_05	387	-	392 894.4	5 748 177.1	392 889.2	5 748 167.6	10.8
11/11/2021	17:50:06	FE7e_01a	Still	FE7e_01a_06	388	-	392 894.4	5 748 177.1	392 885.9	5 748 164.2	15.4
11/11/2021	17:50:22	FE7e_01a	Still	FE7e_01a_07	389	-	392 894.4	5 748 177.1	392 882.4	5 748 157.1	23.4
11/11/2021	17:50:28	FE7e_01a	Video	EOL	390	-	392 894.4	5 748 177.1	392 881.2	5 748 154.4	26.3
11/11/2021	18:20:29	FE7d_03a_a	Video	SOL	391	10	392 590.3	5 746 236.9	392 614.5	5 746 259.4	33.1
11/11/2021	18:21:25	FE7d_03a_a	Still	FE7d_03a_01	394	-	392 590.3	5 746 236.9	392 596.3	5 746 247.6	12.3
11/11/2021	18:21:35	FE7d_03a_a	Still	FE7d_03a_02	395	-	392 590.3	5 746 236.9	392 594.8	5 746 244.4	8.8
11/11/2021	18:21:38	FE7d_03a_a	Still	FE7d_03a_03	396	-	392 590.3	5 746 236.9	392 594.3	5 746 243.4	7.6
11/11/2021	18:21:41	FE7d_03a_a	Still	FE7d_03a_04	397	-	392 590.3	5 746 236.9	392 593.8	5 746 242.4	6.5
11/11/2021	18:21:52	FE7d_03a_a	Still	FE7d_03a_05	398	-	392 590.3	5 746 236.9	392 592.3	5 746 238.6	2.6
11/11/2021	18:22:05	FE7d_03a_a	Still	FE7d_03a_06	399	-	392 590.3	5 746 236.9	392 591.0	5 746 234.7	2.3
11/11/2021	18:22:24	FE7d_03a_a	Still	FE7d_03a_07	400	-	392 590.3	5 746 236.9	392 588.7	5 746 230.2	6.9

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	18:22:43	FE7d_03a_a	Still	FE7d_03a_08	401	-	392 590.3	5 746 236.9	392 587.5	5 746 226.2	11.0
11/11/2021	18:22:58	FE7d_03a_a	Still	FE7d_03a_09	402	-	392 590.3	5 746 236.9	392 588.0	5 746 222.8	14.3
11/11/2021	18:23:10	FE7d_03a_a	Still	FE7d_03a_10	403	-	392 590.3	5 746 236.9	392 587.7	5 746 220.4	16.7
11/11/2021	18:23:16	FE7d_03a_a	Still	FE7d_03a_11	404	-	392 590.3	5 746 236.9	392 586.9	5 746 219.9	17.3
11/11/2021	18:23:29	FE7d_03a_a	Still	FE7d_03a_12	405	-	392 590.3	5 746 236.9	392 586.4	5 746 217.9	19.4
11/11/2021	18:23:41	FE7d_03a_a	Still	FE7d_03a_13	406	-	392 590.3	5 746 236.9	392 586.6	5 746 215.5	21.7
11/11/2021	18:23:52	FE7d_03a_a	Still	FE7d_03a_14	407	-	392 590.3	5 746 236.9	392 586.7	5 746 213.3	23.9
11/11/2021	18:23:57	FE7d_03a_a	Still	FE7d_03a_15	408	-	392 590.3	5 746 236.9	392 586.6	5 746 212.4	24.8
11/11/2021	18:24:13	FE7d_03a_a	Still	FE7d_03a_16	409	-	392 590.3	5 746 236.9	392 585.0	5 746 210.9	26.5
11/11/2021	18:24:24	FE7d_03a_a	Video	EOL	410	-	392 590.3	5 746 236.9	392 584.9	5 746 209.1	28.3
11/11/2021	19:44:14	FE7f_02a	Video	SOL	412	-	395 936.0	5 750 566.0	395 964.7	5 750 586.1	35.0
11/11/2021	19:44:33	FE7f_02a	Still	FE7f_02a_01	413	-	395 936.0	5 750 566.0	395 962.5	5 750 581.0	30.5
11/11/2021	19:44:53	FE7f_02a	Still	FE7f_02a_02	414	-	395 936.0	5 750 566.0	395 959.1	5 750 576.5	25.4
11/11/2021	19:45:06	FE7f_02a	Still	FE7f_02a_03	415	-	395 936.0	5 750 566.0	395 957.1	5 750 573.2	22.2
11/11/2021	19:45:26	FE7f_02a	Still	FE7f_02a_04	416	-	395 936.0	5 750 566.0	395 954.6	5 750 568.3	18.8
11/11/2021	19:45:37	FE7f_02a	Still	FE7f_02a_05	417	-	395 936.0	5 750 566.0	395 953.8	5 750 567.7	17.9
11/11/2021	19:45:57	FE7f_02a	Still	FE7f_02a_06	418	-	395 936.0	5 750 566.0	395 953.8	5 750 568.7	18.0
11/11/2021	19:46:07	FE7f_02a	Still	FE7f_02a_07	419	-	395 936.0	5 750 566.0	395 951.8	5 750 568.4	16.0
11/11/2021	19:46:22	FE7f_02a	Still	FE7f_02a_08	420	-	395 936.0	5 750 566.0	395 952.6	5 750 566.4	16.6
11/11/2021	19:47:12	FE7f_02a	Still	FE7f_02a_09	421	-	395 936.0	5 750 566.0	395 949.2	5 750 560.0	14.5
11/11/2021	19:47:42	FE7f_02a	Still	FE7f_02a_10	422	-	395 936.0	5 750 566.0	395 949.4	5 750 558.0	15.6

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	19:47:55	FE7f_02a	Still	FE7f_02a_11	423	-	395 936.0	5 750 566.0	395 948.5	5 750 556.3	15.8
11/11/2021	19:48:12	FE7f_02a	Still	FE7f_02a_12	424	-	395 936.0	5 750 566.0	395 943.0	5 750 554.6	13.4
11/11/2021	19:48:33	FE7f_02a	Still	FE7f_02a_13	425	-	395 936.0	5 750 566.0	395 941.6	5 750 548.5	18.3
11/11/2021	19:48:51	FE7f_02a	Still	FE7f_02a_14	426	-	395 936.0	5 750 566.0	395 942.7	5 750 542.0	24.9
11/11/2021	19:49:11	FE7f_02a	Still	FE7f_02a_15	427	-	395 936.0	5 750 566.0	395 941.8	5 750 536.4	30.1
11/11/2021	19:49:24	FE7f_02a	Video	EOL	428	-	395 936.0	5 750 566.0	395 941.8	5 750 532.6	33.9
11/11/2021	20:21:39	FE7e_03a	Video	SOL	429	9	393 756.8	5 749 639.0	393 784.9	5 749 691.9	59.9
11/11/2021	20:23:15	FE7d_03a	Still	FE7e_03a_01	431	-	393 756.8	5 749 639.0	393 761.3	5 749 661.9	23.4
11/11/2021	20:24:04	FE7d_03a	Still	FE7e_03a_02	432	-	393 756.8	5 749 639.0	393 769.1	5 749 646.5	14.4
11/11/2021	20:24:12	FE7d_03a	Still	FE7e_03a_03	433	-	393 756.8	5 749 639.0	393 768.6	5 749 644.5	13.0
11/11/2021	20:24:22	FE7d_03a	Still	FE7e_03a_04	434	-	393 756.8	5 749 639.0	393 768.0	5 749 642.5	11.7
11/11/2021	20:24:37	FE7d_03a	Still	FE7e_03a_05	435	-	393 756.8	5 749 639.0	393 768.3	5 749 639.3	11.5
11/11/2021	20:24:48	FE7d_03a	Still	FE7e_03a_06	436	-	393 756.8	5 749 639.0	393 768.5	5 749 637.5	11.8
11/11/2021	20:25:01	FE7d_03a	Still	FE7e_03a_07	437	-	393 756.8	5 749 639.0	393 767.6	5 749 636.1	11.2
11/11/2021	20:25:19	FE7d_03a	Still	FE7e_03a_08	438	-	393 756.8	5 749 639.0	393 764.8	5 749 635.5	8.7
11/11/2021	20:25:33	FE7d_03a	Still	FE7e_03a_09	439	-	393 756.8	5 749 639.0	393 762.9	5 749 635.4	7.1
11/11/2021	20:25:52	FE7d_03a	Still	FE7e_03a_10	440	-	393 756.8	5 749 639.0	393 761.3	5 749 634.7	6.2
11/11/2021	20:26:00	FE7d_03a	Still	FE7e_03a_11	441	-	393 756.8	5 749 639.0	393 760.9	5 749 634.4	6.1
11/11/2021	20:27:07	FE7d_03a	Still	FE7e_03a_12	442	-	393 756.8	5 749 639.0	393 759.6	5 749 625.4	13.9
11/11/2021	20:27:37	FE7d_03a	Still	FE7e_03a_13	443	-	393 756.8	5 749 639.0	393 760.8	5 749 621.4	18.1
11/11/2021	20:27:46	FE7d_03a	Still	FE7e_03a_14	444	-	393 756.8	5 749 639.0	393 760.7	5 749 620.4	19.0

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	20:28:02	FE7d_03a	Still	FE7e_03a_15	445	-	393 756.8	5 749 639.0	393 759.9	5 749 618.7	20.5
11/11/2021	20:28:26	FE7d_03a	Still	FE7e_03a_16	446	-	393 756.8	5 749 639.0	393 758.9	5 749 616.4	22.7
11/11/2021	20:28:35	FE7d_03a	Video	EOL	447	-	393 756.8	5 749 639.0	393 758.8	5 749 615.6	23.5
11/11/2021	20:53:06	FE7e_01a	Video	SOL	448	-	392 894.4	5 748 177.1	392 909.7	5 748 193.2	22.2
11/11/2021	20:53:14	FE7e_01a_a	Still	FE7e_01a_a_01	449	-	392 894.4	5 748 177.1	392 909.7	5 748 191.2	20.8
11/11/2021	20:53:41	FE7e_01a_a	Still	FE7e_01a_a_02	450	-	392 894.4	5 748 177.1	392 909.7	5 748 181.2	15.8
11/11/2021	20:54:08	FE7e_01a_a	Still	FE7e_01a_a_03	451	-	392 894.4	5 748 177.1	392 903.9	5 748 172.5	10.6
11/11/2021	20:54:19	FE7e_01a_a	Still	FE7e_01a_a_04	452	-	392 894.4	5 748 177.1	392 901.8	5 748 171.7	9.2
11/11/2021	20:54:52	FE7e_01a_a	Still	FE7e_01a_a_05	453	-	392 894.4	5 748 177.1	392 899.7	5 748 173.6	6.4
11/11/2021	20:55:20	FE7e_01a_a	Still	FE7e_01a_a_06	454	-	392 894.4	5 748 177.1	392 889.9	5 748 173.1	6.0
11/11/2021	20:55:33	FE7e_01a_a	Still	FE7e_01a_a_07	455	-	392 894.4	5 748 177.1	392 886.3	5 748 170.5	10.4
11/11/2021	20:55:48	FE7e_01a_a	Still	FE7e_01a_a_08	456	-	392 894.4	5 748 177.1	392 885.2	5 748 168.6	12.5
11/11/2021	20:56:15	FE7e_01a_a	Still	FE7e_01a_a_09	457	-	392 894.4	5 748 177.1	392 889.3	5 748 165.4	12.8
11/11/2021	20:56:36	FE7e_01a_a	Still	FE7e_01a_a_10	458	-	392 894.4	5 748 177.1	392 890.4	5 748 161.2	16.4
11/11/2021	20:57:01	FE7e_01a_a	Still	FE7e_01a_a_11	459	-	392 894.4	5 748 177.1	392 881.5	5 748 163.4	18.8
11/11/2021	20:57:49	FE7e_01a_a	Still	FE7e_01a_a_12	460	-	392 894.4	5 748 177.1	392 869.2	5 748 160.0	30.5
11/11/2021	20:58:04	FE7e_01a_a	Video	EOL	461	-	392 894.4	5 748 177.1	392 868.4	5 748 155.4	33.9
11/11/2021	21:16:29	FE7d_03a_a	Video	SOL	462	9	392 590.3	5 746 236.9	392 615.6	5 746 256.9	32.3
11/11/2021	21:16:56	FE7d_03a_a	Still	FE7d_03a_a_01	463	-	392 590.3	5 746 236.9	392 602.3	5 746 257.0	23.4
11/11/2021	21:17:28	FE7d_03a_a	Still	FE7d_03a_a_02	464	-	392 590.3	5 746 236.9	392 594.9	5 746 249.9	13.8
11/11/2021	21:17:44	FE7d_03a_a	Still	FE7d_03a_a_03	465	-	392 590.3	5 746 236.9	392 594.8	5 746 243.2	7.7

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	21:18:16	FE7d_03a_a	Still	FE7d_03a_a_04	466	-	392 590.3	5 746 236.9	392 602.6	5 746 231.4	13.5
11/11/2021	21:18:44	FE7d_03a_a	Still	FE7d_03a_a_05	467	-	392 590.3	5 746 236.9	392 602.0	5 746 230.9	13.1
11/11/2021	21:18:52	FE7d_03a_a	Still	FE7d_03a_a_06	468	-	392 590.3	5 746 236.9	392 602.8	5 746 231.3	13.7
11/11/2021	21:19:00	FE7d_03a_a	Still	FE7d_03a_a_07	469	-	392 590.3	5 746 236.9	392 602.4	5 746 231.0	13.4
11/11/2021	21:19:22	FE7d_03a_a	Still	FE7d_03a_a_08	470	-	392 590.3	5 746 236.9	392 605.2	5 746 225.0	19.1
11/11/2021	21:19:50	FE7d_03a_a	Video	EOL	471	-	392 590.3	5 746 236.9	392 633.3	5 746 217.0	47.4
11/11/2021	21:38:48	FE7d_02	Video	SOL	472	7	391 572.8	5 745 581.8	391 599.2	5 745 598.3	31.1
11/11/2021	21:39:01	FE7d_02	Still	FE7d_02_01	473	-	391 572.8	5 745 581.8	391 593.6	5 745 594.4	24.3
11/11/2021	21:39:34	FE7d_02	Still	FE7d_02_02	474	-	391 572.8	5 745 581.8	391 581.3	5 745 587.3	10.1
11/11/2021	21:39:50	FE7d_02	Still	FE7d_02_03	475	-	391 572.8	5 745 581.8	391 576.3	5 745 588.0	7.1
11/11/2021	21:40:08	FE7d_02	Still	FE7d_02_04	476	-	391 572.8	5 745 581.8	391 570.1	5 745 586.8	5.6
11/11/2021	21:40:25	FE7d_02	Still	FE7d_02_05	477	-	391 572.8	5 745 581.8	391 565.9	5 745 581.1	7.0
11/11/2021	21:41:12	FE7d_02	Still	FE7d_02_06	478	-	391 572.8	5 745 581.8	391 558.7	5 745 565.4	21.7
11/11/2021	21:41:25	FE7d_02	Still	FE7d_02_07	479	-	391 572.8	5 745 581.8	391 555.5	5 745 562.7	25.7
11/11/2021	21:41:35	FE7d_02	Still	FE7d_02_08	480	-	391 572.8	5 745 581.8	391 553.9	5 745 561.4	27.8
11/11/2021	21:50:43	FE7d_02a	Video	SOL	481	6	390 625.3	5 745 539.2	390 654.1	5 745 557.3	34.0
11/11/2021	21:51:16	FE7d_02a	Still	FE7d_02a_01	482	-	390 625.3	5 745 539.2	390 635.8	5 745 550.2	15.2
11/11/2021	21:51:26	FE7d_02a	Still	FE7d_02a_02	483	-	390 625.3	5 745 539.2	390 631.4	5 745 547.4	10.2
11/11/2021	21:51:38	FE7d_02a	Still	FE7d_02a_03	484	-	390 625.3	5 745 539.2	390 627.1	5 745 544.5	5.6
11/11/2021	21:51:55	FE7d_02a	Still	FE7d_02a_04	485	-	390 625.3	5 745 539.2	390 620.9	5 745 541.0	4.7
11/11/2021	21:52:15	FE7d_02a	Still	FE7d_02a_05	486	-	390 625.3	5 745 539.2	390 617.5	5 745 534.7	9.1

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	21:52:29	FE7d_02a	Still	FE7d_02a_06	487	-	390 625.3	5 745 539.2	390 618.5	5 745 528.7	12.6
11/11/2021	21:52:47	FE7d_02a	Still	FE7d_02a_07	488	-	390 625.3	5 745 539.2	390 621.0	5 745 521.6	18.2
11/11/2021	21:53:12	FE7d_02a	Still	FE7d_02a_08	489	-	390 625.3	5 745 539.2	390 624.8	5 745 516.9	22.3
11/11/2021	21:53:20	FE7d_02a	Still	FE7d_02a_09	490	-	390 625.3	5 745 539.2	390 626.1	5 745 516.0	23.2
11/11/2021	21:53:39	FE7d_02a	Still	FE7d_02a_10	491	-	390 625.3	5 745 539.2	390 629.2	5 745 515.0	24.5
11/11/2021	21:53:44	FE7d_02a	Still	FE7d_02a_11	492	-	390 625.3	5 745 539.2	390 630.1	5 745 515.1	24.6
11/11/2021	21:53:59	FE7d_02a	Still	FE7d_02a_12	493	-	390 625.3	5 745 539.2	390 629.2	5 745 516.3	23.2
11/11/2021	21:54:05	FE7d_02a	Still	FE7d_02a_13	494	-	390 625.3	5 745 539.2	390 628.0	5 745 516.8	22.5
11/11/2021	21:54:15	FE7d_02a	Still	FE7d_02a_14	495	-	390 625.3	5 745 539.2	390 625.8	5 745 516.6	22.6
11/11/2021	22:35:10	FE7b_03	Video	SOL	496	6	381 508.9	5 742 019.1	381 528.8	5 742 039.4	28.4
11/11/2021	22:35:17	FE7b_03	Still	FE7b_03_01	497	-	381 508.9	5 742 019.1	381 526.0	5 742 039.3	26.5
11/11/2021	22:36:08	FE7b_03	Still	FE7b_03_02	498	-	381 508.9	5 742 019.1	381 498.8	5 742 042.4	25.4
11/11/2021	22:36:20	FE7b_03	Still	FE7b_03_03	499	-	381 508.9	5 742 019.1	381 494.7	5 742 037.3	23.1
11/11/2021	22:36:35	FE7b_03	Still	FE7b_03_04	500	-	381 508.9	5 742 019.1	381 493.3	5 742 031.6	20.0
11/11/2021	22:36:43	FE7b_03	Still	FE7b_03_05	501	-	381 508.9	5 742 019.1	381 493.8	5 742 029.1	18.1
11/11/2021	22:36:54	FE7b_03	Still	FE7b_03_06	502	-	381 508.9	5 742 019.1	381 495.3	5 742 025.7	15.1
11/11/2021	22:37:19	FE7b_03	Still	FE7b_03_07	503	-	381 508.9	5 742 019.1	381 500.7	5 742 021.9	8.6
11/11/2021	22:37:25	FE7b_03	Still	FE7b_03_08	504	-	381 508.9	5 742 019.1	381 502.1	5 742 021.7	7.3
11/11/2021	22:37:44	FE7b_03	Still	FE7b_03_09	505	-	381 508.9	5 742 019.1	381 507.4	5 742 022.1	3.3
11/11/2021	22:37:57	FE7b_03	Still	FE7b_03_10	506	-	381 508.9	5 742 019.1	381 511.5	5 742 023.5	5.1
11/11/2021	22:38:20	FE7b_03	Still	FE7b_03_11	507	-	381 508.9	5 742 019.1	381 523.5	5 742 027.6	16.9

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	22:38:50	FE7b_03	Still	FE7b_03_12	508	-	381 508.9	5 742 019.1	381 535.4	5 742 030.0	28.6
11/11/2021	22:39:03	FE7b_03	Video	EOL	509	-	381 508.9	5 742 019.1	381 538.8	5 742 030.4	31.9
11/11/2021	22:48:42	FE7b_01	Video	SOL	510	7	381 555.4	5 742 302.3	381 580.5	5 742 325.8	34.4
11/11/2021	22:49:14	FE7b_01	Still	FE7b_01_01	511	-	381 555.4	5 742 302.3	381 561.8	5 742 313.1	12.5
11/11/2021	22:49:35	FE7b_01	Still	FE7b_01_02	512	-	381 555.4	5 742 302.3	381 554.0	5 742 307.8	5.7
11/11/2021	22:49:41	FE7b_01	Still	FE7b_01_03	513	-	381 555.4	5 742 302.3	381 551.9	5 742 306.9	5.7
11/11/2021	22:50:05	FE7b_01	Still	FE7b_01_04	514	-	381 555.4	5 742 302.3	381 545.2	5 742 304.1	10.4
11/11/2021	22:50:11	FE7b_01	Still	FE7b_01_05	515	-	381 555.4	5 742 302.3	381 544.0	5 742 303.7	11.5
11/11/2021	22:50:26	FE7b_01	Still	FE7b_01_06	516	-	381 555.4	5 742 302.3	381 541.0	5 742 303.7	14.5
11/11/2021	22:50:43	FE7b_01	Still	FE7b_01_07	517	-	381 555.4	5 742 302.3	381 538.0	5 742 303.9	17.5
11/11/2021	22:50:52	FE7b_01	Still	FE7b_01_08	518	-	381 555.4	5 742 302.3	381 536.5	5 742 304.1	19.0
11/11/2021	22:51:13	FE7b_01	Still	FE7b_01_09	519	-	381 555.4	5 742 302.3	381 533.5	5 742 305.6	22.1
11/11/2021	22:51:18	FE7b_01	Still	FE7b_01_10	520	-	381 555.4	5 742 302.3	381 532.9	5 742 306.2	22.8
11/11/2021	22:51:39	FE7b_01	Still	FE7b_01_11	521	-	381 555.4	5 742 302.3	381 531.1	5 742 307.8	24.9
11/11/2021	22:51:54	FE7b_01	Video	EOL	522	-	381 555.4	5 742 302.3	381 529.9	5 742 309.1	26.4
11/11/2021	23:06:57	FE7b_01a	Video	SOL	523	7	381 555.4	5 742 302.3	381 528.2	5 742 283.3	33.2
11/11/2021	23:07:48	FE7b_01a	Still	FE7b_01a_01	524	-	381 555.4	5 742 302.3	381 550.7	5 742 301.5	4.8
11/11/2021	23:08:25	FE7b_01a	Still	FE7b_01a_02	525	-	381 555.4	5 742 302.3	381 556.3	5 742 311.2	8.9
11/11/2021	23:08:30	FE7b_01a	Still	FE7b_01a_03	526	-	381 555.4	5 742 302.3	381 556.6	5 742 312.2	10.0
11/11/2021	23:08:49	FE7b_01a	Still	FE7b_01a_04	527	-	381 555.4	5 742 302.3	381 557.9	5 742 316.1	14.0
11/11/2021	23:08:54	FE7b_01a	Still	FE7b_01a_05	528	-	381 555.4	5 742 302.3	381 558.5	5 742 317.2	15.3

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
11/11/2021	23:09:19	FE7b_01a	Still	FE7b_01a_06	529	-	381 555.4	5 742 302.3	381 561.2	5 742 318.7	17.4
11/11/2021	23:09:35	FE7b_01a	Still	FE7b_01a_07	530	-	381 555.4	5 742 302.3	381 562.8	5 742 320.7	19.8
11/11/2021	23:09:51	FE7b_01a	Still	FE7b_01a_08	531	-	381 555.4	5 742 302.3	381 563.9	5 742 322.7	22.1
11/11/2021	23:10:09	FE7b_01a	Still	FE7b_01a_09	532	-	381 555.4	5 742 302.3	381 564.9	5 742 324.7	24.4
11/11/2021	23:10:26	FE7b_01a	Still	FE7b_01a_10	533	-	381 555.4	5 742 302.3	381 565.4	5 742 326.3	26.0
11/11/2021	23:10:46	FE7b_01a	Still	FE7b_01a_11	534	-	381 555.4	5 742 302.3	381 565.4	5 742 327.9	27.5
11/11/2021	23:11:04	FE7b_01a	Still	FE7b_01a_12	535	-	381 555.4	5 742 302.3	381 565.1	5 742 329.0	28.4
11/11/2021	23:11:12	FE7b_01a	Video	EOL	536	-	381 555.4	5 742 302.3	381 564.8	5 742 329.3	28.5
11/11/2021	23:19:09	FE7b_02	Video	SOL	537	6	381 454.7	5 742 388.5	381 480.8	5 742 416.3	38.1
11/11/2021	23:19:22	FE7b_02	Still	FE7b_02_01	538	-	381 454.7	5 742 388.5	381 476.5	5 742 412.7	32.5
11/11/2021	23:20:22	FE7b_02	Still	FE7b_02_02	539	-	381 454.7	5 742 388.5	381 465.0	5 742 400.4	15.7
11/11/2021	23:20:26	FE7b_02	Still	FE7b_02_03	540	-	381 454.7	5 742 388.5	381 464.3	5 742 399.6	14.7
11/11/2021	23:20:44	FE7b_02	Still	FE7b_02_04	541	-	381 454.7	5 742 388.5	381 461.9	5 742 396.4	10.7
11/11/2021	23:21:07	FE7b_02	Still	FE7b_02_05	542	-	381 454.7	5 742 388.5	381 456.8	5 742 393.8	5.7
11/11/2021	23:22:16	FE7b_02	Still	FE7b_02_06	543	-	381 454.7	5 742 388.5	381 439.7	5 742 392.4	15.5
11/11/2021	23:22:22	FE7b_02	Still	FE7b_02_07	544	-	381 454.7	5 742 388.5	381 438.6	5 742 392.2	16.5
11/11/2021	23:22:48	FE7b_02	Still	FE7b_02_08	545	-	381 454.7	5 742 388.5	381 434.3	5 742 391.8	20.7
11/11/2021	23:23:13	FE7b_02	Still	FE7b_02_09	546	-	381 454.7	5 742 388.5	381 430.7	5 742 390.7	24.1
11/11/2021	23:23:42	FE7b_02	Video	EOL	547	-	381 454.7	5 742 388.5	381 427.2	5 742 389.7	27.5
11/11/2021	23:59:50	FE7b_02	DG	SC	548	8	381 454.7	5 742 388.5	381 457.8	5 742 382.1	7.1
12/11/2021	00:15:01	FE7b_04	DG	SC	549	8	382 109.0	5 742 112.9	382 114.5	5 742 121.4	10.2

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
12/11/2021	01:39:01	FE7c_04	DG	SC	550	11	389 055.0	5 744 022.0	389 060.2	5 744 030.3	9.8
12/11/2021	02:37:47	FE7e_02	DG	SC	551	12	392 970.0	5 748 303.0	392 961.2	5 748 299.4	9.5
14/11/2021	21:06:31	FE7b_02	HG	FA	553	9	381 454.7	5 742 388.5	381 456.3	5 742 394.6	6.3
14/11/2021	21:32:20	FE7b_04	HG	FA	554	10	382 109.0	5 742 112.9	382 114.7	5 742 115.2	6.1
14/11/2021	22:21:19	FE7b_05	HG	FA	555	9	383 290.0	5 742 263.0	383 300.8	5 742 269.4	12.5
14/11/2021	23:12:13	FE7b_06	HG	FA	557	10	384 667.0	5 742 324.0	384 667.1	5 742 324.3	0.3
14/11/2021	23:54:32	FE7c_01	HG	NS	558	9	385 936.0	5 742 691.0	385 940.5	5 742 693.1	4.9
15/11/2021	00:27:22	FE7c_01	HG	FA	559	9	385 936.0	5 742 691.0	385 941.5	5 742 696.5	7.8
15/11/2021	01:02:14	FE7c_02	HG	NS	560	9	387 190.0	5 743 318.0	387 205.7	5 743 325.4	17.3
15/11/2021	01:20:16	FE7c_02	HG	FA	562	9	387 190.0	5 743 318.0	387 198.6	5 743 325.9	11.6
15/11/2021	02:27:28	FE7c_03	HG	FA	563	9	388 184.0	5 743 823.0	388 197.6	5 743 823.6	13.6
15/11/2021	03:04:29	FE7c_04	HG	FA	564	10	389 055.0	5 744 022.0	389 049.8	5 744 032.0	11.3
15/11/2021	03:58:50	FE7d_01	HG	NS	565	9	390 309.0	5 744 985.0	390 296.0	5 744 977.2	15.2
15/11/2021	04:12:26	FE7d_01	HG	NS	566	9	390 309.0	5 744 985.0	390 298.6	5 744 965.5	22.1
15/11/2021	04:36:30	FE7d_01	HG	FA	567	9	390 309.0	5 744 985.0	390 302.2	5 744 980.6	8.1
15/11/2021	05:38:25	FE7d_02	HG	NS	568	8	391 572.8	5 745 581.8	391 566.7	5 745 576.1	8.3
15/11/2021	05:44:08	FE7d_02	HG	NS	569	8	391 572.8	5 745 581.8	391 558.5	5 745 562.1	24.3
15/11/2021	06:24:33	FE7d_02	HG	NS	570	8	391 572.8	5 745 581.8	391 569.4	5 745 571.2	11.1
15/11/2021	06:46:57	FE7d_02	HG	NS	572	8	391 572.8	5 745 581.8	391 579.9	5 745 589.8	10.7
15/11/2021	07:40:39	FE7d_02	HG	NS	573	8	391 572.8	5 745 581.8	391 575.9	5 745 595.5	14.0
15/11/2021	07:57:14	FE7d_03	HG	NS	574	11	392 632.9	5 746 248.0	392 636.2	5 746 260.1	12.5

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
15/11/2021	08:18:42	FE7d_03	HG	NS	575	11	392 632.9	5 746 248.0	392 626.9	5 746 241.9	8.6
15/11/2021	08:30:55	FE7d_03	HG	NS	576	11	392 632.9	5 746 248.0	392 634.4	5 746 250.1	2.6
15/11/2021	09:05:23	FE7d_03	HG	FA	577	11	392 632.9	5 746 248.0	392 631.5	5 746 248.7	1.6
15/11/2021	09:29:54	FE7e_01	HG	NS	578	12	392 863.0	5 747 783.0	392 866.6	5 747 784.4	3.9
15/11/2021	09:46:54	FE7e_01	HG	FA	579	12	392 863.0	5 747 783.0	392 869.0	5 747 787.2	7.4
15/11/2021	10:12:10	FE7e_02	HG	FA	580	13	392 970.0	5 748 303.0	392 971.9	5 748 305.2	2.9
15/11/2021	10:40:24	FE7e_03	HG	FA	581	11	393 566.0	5 749 542.0	393 569.7	5 749 546.2	5.6
15/11/2021	11:01:41	FE7f_01	HG	NS	582	10	394 682.0	5 750 306.0	394 689.2	5 750 318.4	14.3
15/11/2021	11:15:02	FE7f_01	HG	FA	583	10	394 682.0	5 750 306.0	394 683.0	5 750 306.8	1.3
15/11/2021	11:26:11	FE7f_01	HG	NS	584	10	394 682.0	5 750 306.0	394 677.7	5 750 303.7	4.9
15/11/2021	11:43:20	FE7f_01_moved	HG	NS	585	10	394 682.0	5 750 306.0	394 625.9	5 750 308.4	56.2
15/11/2021	12:47:39	FE7f_02	HG	NS	586	7	395 936.0	5 750 566.0	395 937.8	5 750 578.3	12.4
15/11/2021	12:53:21	FE7f_02	HG	NS	587	7	395 936.0	5 750 566.0	395 939.8	5 750 587.6	21.9
15/11/2021	12:59:32	FE7f_02	HG	NS	588	7	395 936.0	5 750 566.0	395 949.1	5 750 580.9	19.8
15/11/2021	13:12:44	FE7f_02_moved	HG	NS	589	7	395 936.0	5 750 566.0	395 997.2	5 750 582.9	63.4
15/11/2021	13:30:06	FE7g_01	HG	NS	590	9	397 129.0	5 749 909.0	397 136.2	5 749 910.3	7.3
15/11/2021	13:49:35	FE7g_01	HG	NS	591	9	397 129.0	5 749 909.0	397 137.6	5 749 916.9	11.7
15/11/2021	14:31:41	FE7g_01	HG	NS	592	9	397 129.0	5 749 909.0	397 142.7	5 749 915.5	15.2
15/11/2021	14:38:28	FE7g_01	HG	FA	593	9	397 129.0	5 749 909.0	397 060.6	5 749 907.1	68.4
15/11/2021	15:08:48	FE7g_02	HG	FA	594	11	398 410.0	5 749 371.0	398 410.2	5 749 373.2	2.2
15/11/2021	15:57:32	FE7g_03	HG	SC	595	16	399 484.4	5 748 814.3	399 473.2	5 748 809.2	12.3

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	
15/11/2021	16:41:44	FE7g_03	DG	FA	596	16	399 484.4	5 748 814.3	399 477.8	5 748 803.1	13.0
15/11/2021	17:40:29	FE6_01	HG	NS	597	15	398 993.0	5 747 423.0	398 986.3	5 747 408.8	15.7
15/11/2021	17:51:37	FE6_01	HG	FA	598	15	398 993.0	5 747 423.0	398 985.2	5 747 405.1	19.6
15/11/2021	18:35:35	FE6_02	HG	FA	599	15	398 489.0	5 746 031.0	398 490.1	5 746 039.6	8.7
15/11/2021	19:13:33	FE6_04	HG	NS	600	17	399 941.0	5 743 615.0	399 935.3	5 743 603.8	12.6
15/11/2021	19:26:37	FE6_04	HG	NS	601	17	399 941.0	5 743 615.0	399 938.7	5 743 616.8	2.9
15/11/2021	19:42:24	FE6_04	HG	FA	602	17	399 941.0	5 743 615.0	399 938.6	5 743 631.8	17.0
15/11/2021	20:12:01	FE6_05	HG	NS	603	22	401 027.0	5 742 943.0	401 020.6	5 742 938.2	8.0
15/11/2021	20:28:04	FE6_05	HG	NS	604	22	401 027.0	5 742 943.0	401 020.6	5 742 936.8	9.0
15/11/2021	21:22:48	FE6_05	HG	NS	605	22	401 027.0	5 742 943.0	401 033.9	5 742 952.6	11.8
15/11/2021	21:37:21	FE6_05_50E	HG	NS	607	22	401 027.0	5 742 943.0	401 084.6	5 742 957.4	59.4
15/11/2021	21:53:33	FE6_06	HG	FA	608	17	402 426.0	5 743 023.0	402 432.1	5 743 025.2	6.4
15/11/2021	22:21:41	FE6_07	HG	FA	609	20	403 871.0	5 743 138.0	403 878.5	5 743 139.3	7.6
15/11/2021	22:48:43	FE6_08	HG	FA	610	22	405 301.0	5 743 436.0	405 303.2	5 743 437.7	2.8
15/11/2021	23:12:52	FE6_09	HG	FA	611	20	406 753.0	5 743 803.0	406 767.5	5 743 814.2	18.3
16/11/2021	01:09:25	FE6_10	HG	FA	615	21	408 472.0	5 744 432.0	408 482.6	5 744 447.2	18.6
16/11/2021	01:35:10	FE6_11	HG	FA	616	23	409 460.0	5 744 858.0	409 467.8	5 744 861.7	8.6
16/11/2021	02:10:28	FE6_11	HG	NS	617	23	409 460.0	5 744 858.0	409 463.7	5 744 861.9	5.4
16/11/2021	02:31:55	FE6_11	HG	NS	618	23	409 460.0	5 744 858.0	409 463.5	5 744 851.7	7.2
16/11/2021	02:38:10	FE6_11	HG	NS	619	23	409 460.0	5 744 858.0	409 462.3	5 744 841.3	16.9
16/11/2021	02:48:44	FE6_11_moved	HG	NS	620	23	409 460.0	5 744 858.0	409 420.0	5 744 848.1	41.2
Notes											

Geodetic Parameters: WGS 84, UTM Zone 31 North											
Date	Time [UTC]	Transect	Type	Sample Rep / Still No.	Fix No.	Water Depth [m BSL]	Proposed Location		Actual Location		Offset [m]
							Easting	Northing	Easting	Northing	

BSL = Below sea level
FA = Fauna sample A
NT = Not triggered
UTC = Coordinated Universal Time
DG = Day grab
HG = Hamon grab
SC = Sediment chemistry
EOL = End of line
NS = No sample
SOL = Start of line

C.3 Grab Log

Date	Time [UTC]	Station	Sample Rep	Fix No.	Sample Volume / depth* [L / cm]	Sediment Description (including stratigraphy)				Comments (fauna, smell, bioturbation, debris)
						Depth [cm]	Sediment Type	Sediment Description	Colour	
09/11/2021	01:08:23	FE5_01	FA	3	5	-	gsM	Gravelly sandy mud	Brown	Clay lumps, shell fragments, brittlestars
09/11/2021	02:14:02	FE5_02	NS	4	-	-		-	-	-
09/11/2021	02:39:31	FE5_02	NS	5	3	-	gsM	Gravelly sandy mud	Brown	-
09/11/2021	07:21:05	FE5_02	NS	7	3	-		-	-	-
09/11/2021	07:45:22	FE5_02	NS	8	1	-		-	-	-
09/11/2021	08:02:06	FE5_02	FA	9	5	-	gsM	Gravelly sandy mud	Brown	-
09/11/2021	08:29:45	FE5_03	FA	10	8	-	gsM	Gravelly sandy mud	Brown	Clay lumps, shell fragments, ophiuroidea, Actineria, urchin, faunal tubes
09/11/2021	09:16:42	FE5_04	FA	11	5	-	gsM	Gravelly sandy mud	Brown	-
09/11/2021	09:41:08	FE5_05	FA	12	6	-	(g)sM	Slightly gravelly sandy mud	Brown	-
09/11/2021	10:31:01	FE5_06	FA	13	6	-	(g)sM	Slightly gravelly sandy mud	Brown	Urchins
09/11/2021	11:01:10	FE5_07	FA	15	8	-	(g)sM	Slightly gravelly sandy mud	Brown	-
09/11/2021	11:55:31	FE5_08	FA	17	6	-	(g)sM	Slightly gravelly sandy mud	Brown	Consolidated clay, piddocks, urchins
09/11/2021	13:09:20	FE5_09	FA	18	8	-	(g)sM	Slightly gravelly sandy mud	Brown	Brittlestars, consolidated clay, shell fragments
09/11/2021	13:51:39	FE5_09	SC	19	8 cm	-	(g)sM	Slightly gravelly sandy mud	Brown	Brittlestars
09/11/2021	14:30:45	FE4_02	NT	20	-	-		-	-	Did not trigger
09/11/2021	14:42:32	FE4_02	NS	21	-	-		-	-	Rock in jaw
09/11/2021	14:57:22	FE4_02	NS	22	-	-		-	-	Triggered in water column

Date	Time [UTC]	Station	Sample Rep	Fix No.	Sample Volume / depth* [L / cm]	Sediment Description (including stratigraphy)				Comments (fauna, smell, bioturbation, debris)
						Depth [cm]	Sediment Type	Sediment Description	Colour	
09/11/2021	15:10:06	FE4_02	NS	23	-	-		-	-	Triggered in water column
09/11/2021	15:47:57	FE4_02	SC	24	7	-	gsM	Gravelly sandy mud	Brown	Moved 50m
09/11/2021	16:33:30	FE4_05	SC	25	7	-	gsM	Gravelly sandy mud	Brown	Brittlestars
09/11/2021	19:04:11	FE5_10	FA	26	8	-	gsM	Gravelly sandy mud	Brown	Clay lumps, shell fragments, mud shrimp
09/11/2021	19:38:21	FE4-01	NS	27	2	-	gM	Gravelly clay	Brown	-
09/11/2021	20:14:47	FE4-01	FA	28	5	-	gM	Gravelly clay	Brown	Piddocks
09/11/2021	20:48:16	FE4-02	FA	29	6	-	(g)mS	Slightly gravelly muddy sand	Brown	Urchins
09/11/2021	21:35:16	FE4_03	FA	30	5	-	gsM	Gravelly muddy sand	Brown	Clay lumps, Actineria, Polychaete, Annelids
09/11/2021	22:37:46	FE4_04	FA	31	5	-	gsM	Gravelly muddy sand	Brown	Clay lumps, Actineria, Polychaete, Annelids, mud shrimp, crab, urchin
09/11/2021	23:12:31	FE4_05	FA	32	5	-	gsM	Gravelly muddy sand	Brown	Actineria, *Corystes* sp., urchin
09/11/2021	23:40:14	FE4_06	FA	33	6	-	S	Coarse sand	Yellow	Shell fragments
10/11/2021	00:04:52	FE4_07	NS	34	-	-		-	-	Stone in jaw
10/11/2021	00:18:12	FE4_07	FA	35	5	-	gsM	Gravelly muddy sand	Brown	-
10/11/2021	01:16:13	FE4_08	FA	36	5	-	(g)sM	Slightly gravelly sandy mud	Brown	Shell fragments, clay lumps
12/11/2021	23:59:50	FE7b_02	SC	548	10 cm	-	sM	sandy mud	greyish brown	Shell fragments
12/11/2021	00:15:01	FE7b_04	SC	549	8 cm	-	sM	sandy mud	greyish brown	Shell fragments
12/11/2021	01:39:01	FE7c_04	SC	550	10 cm	1 cm	m	Mud	Brown	1cm surface layer then anoxic

Date	Time [UTC]	Station	Sample Rep	Fix No.	Sample Volume / depth* [L / cm]	Sediment Description (including stratigraphy)				Comments (fauna, smell, bioturbation, debris)
						Depth [cm]	Sediment Type	Sediment Description	Colour	
12/11/2021	01:39:01					9 cm	m	Partially anoxic mud	Grey	
12/11/2021	02:37:47	FE7e_02	SC	551	10 cm	1 cm	m	Mud	Brown	1cm surface layer then anoxic
12/11/2021	02:37:47					9 cm	m	Partially anoxic mud	Grey	
14/11/2021	21:06:31	FE7b_02	FA	553	5	-	(g)M	Slightly gravelly mud	Brown	Clay (consolidated lumps), shell fragments, polychaetes
14/11/2021	21:32:20	FE7b_04	FA	554	9	-	(g)M	Slightly gravelly mud	Brown	Clay (consolidated lumps), shell fragments, peanut worms, Actineria
14/11/2021	22:21:19	FE7b_05	FA	555	10	-	(g)M	Gravelly mud	Brown	Shell fragments, polycheates, helmet crab, very small sab fragments
12/11/2021	22:21:19					-	M	Clay	Grey	Anoxic layer
14/11/2021	23:12:13	FE7b_06	FA	557	8	-	gM	Gravelly mud	Brown	Shell fragments, brittlestars, urchins
12/11/2021	23:12:13					-	M	Clay	Grey	Anoxic layer
14/11/2021	23:54:32	FE7c_01	NS	558	2	-	(g)M	Slightly gravelly mud	Brown	Clay lumps
15/11/2021	00:27:22	FE7c_01	FA	559	7	-	gsM	Gravelly sandy mud	Brown	Brittlestars, shell fragments, cobbles
15/11/2021	01:02:14	FE7c_02	NS	560	< 1	-	gsM	Gravelly sandy mud	Brown	-
15/11/2021	01:20:16	FE7c_02	FA	562	5	-	gsM	Gravelly sandy mud	Brown	Anoxic patch and lumps of clay
15/11/2021	02:27:28	FE7c_03	FA	563	6	-	gsM	Gravelly sandy mud	Brown	-
15/11/2021	03:04:29	FE7c_04	FA	564	10	-	M	Mud	Grey/ Black	Anoxic - hydrogen sulphide smell. Faunal tubes
15/11/2021	03:58:50	FE7d_01	NS	565	< 1	-	gM	Gravelly mud	Brown	-
15/11/2021	04:12:26	FE7d_01	NS	566	2	-	gM	Gravelly mud	Brown	-

Date	Time [UTC]	Station	Sample Rep	Fix No.	Sample Volume / depth* [L / cm]	Sediment Description (including stratigraphy)				Comments (fauna, smell, bioturbation, debris)
						Depth [cm]	Sediment Type	Sediment Description	Colour	
15/11/2021	04:36:30	FE7d_01	FA	567	4	-	gsM	Gravelly sandy mud	Brown	Strong current. Accepted a 4L sample. Sab fragments
15/11/2021	05:38:25	FE7d_02	NS	568	0	-		-	-	-
15/11/2021	05:44:08	FE7d_02	NS	569	0	-		-	-	-
15/11/2021	06:24:33	FE7d_02	NS	570	0	-		-	-	Empty - stong tides
15/11/2021	06:46:57	FE7d_02	NS	572	0	-		-	-	Moved 50m - empty grab
15/11/2021	07:40:39	FE7d_02	NS	573	0	-		-	-	Strong tides - Low volume
15/11/2021	07:57:14	FE7d_03	NS	574	0	-		-	-	Low volume
15/11/2021	08:18:42	FE7d_03	NS	575	0	-		-	-	Stone in jaw
15/11/2021	08:30:55	FE7d_03	NS	576	0	-		-	-	Low volume
15/11/2021	09:05:23	FE7d_03	FA	577	4	-	gM	Gravelly mud	-	Changed rubber on grab (marginal sample) - Shell fragments
15/11/2021	09:29:54	FE7e_01	NS	578	0	-				Low volume
15/11/2021	09:46:54	FE7e_01	FA	579	5	-	gM	Gravelly mud	Brown	Shell fragments
15/11/2021	10:12:10	FE7e_02	FA	580	10	-	(g)M	Slightly gravelly mud	Grey/Black	Anoxic layer, shell fragments, smell hydrogen sulphide
15/11/2021	10:40:24	FE7e_03	FA	581	6	-	mS	Muddy sand	Brown	Shell fragments
15/11/2021	11:01:41	FE7f_01	NS	582	1	-		-	-	Low sample
15/11/2021	11:15:02	FE7f_01	FA	583	3	-	(g)S	Slightly gravelly sand	Brown	Low sample
15/11/2021	11:26:11	FE7f_01	NS	584	1	-			Brown	Low sample
15/11/2021	11:43:20	FE7f_01	NS	585	2	-			Brown	Moved 50m - Low sample
15/11/2021	12:47:39	FE7f_02	NS	586	1	-		-	-	Boulder with epifauna

Date	Time [UTC]	Station	Sample Rep	Fix No.	Sample Volume / depth* [L / cm]	Sediment Description (including stratigraphy)				Comments (fauna, smell, bioturbation, debris)
						Depth [cm]	Sediment Type	Sediment Description	Colour	
15/11/2021	12:53:21	FE7f_02	NS	587	0	-		-	-	Empty grab
15/11/2021	12:59:32	FE7f_02	NS	588	0	-		-	-	Empty grab
15/11/2021	13:12:44	FE7f_02	NS	589	0	-		-	-	Empty grab
15/11/2021	13:30:06	FE7g_01	NS	590	0	-		-	-	Empty grab
15/11/2021	13:49:35	FE7g_01	NS	591	0	-		-	-	Empty grab
15/11/2021	14:31:41	FE7g_01	NS	592	0	-		-	-	Empty grab
15/11/2021	14:38:28	FE7g_01	FA	593	8	-		-	-	Moved 50m - Ascidians
15/11/2021	15:08:48	FE7g_02	FA	594	10	-	sM	Sand and clay	Brown	Anoxic
15/11/2021	15:57:32	FE7g_03	SC	595	11 cm	-	sM	Slightly sandy mud	grey/black	Anoxic layer
15/11/2021	16:41:44	FE7g_03	FA	596	10	-	M	Mud	Black	Anoxic
15/11/2021	17:40:29	FE6_01	NS	597	2	-	gS	Gravelly sand	Brown	-
15/11/2021	17:51:37	FE6_01	FA	598	7	-	gS	Gravelly sand	Brown	-
15/11/2021	18:35:35	FE6_02	FA	599	5	-	gS	Gravelly sand	Brown	Faunal tubes
15/11/2021	19:13:33	FE6_04	NS	600	<1	-	gS	Gravelly sand	Brown	-
15/11/2021	19:26:37	FE6_04	NS	601	1	-	gS	Gravelly sand	Brown	-
15/11/2021	19:42:24	FE6_04	FA	602	6	-	(g)mS	Slightly gravelly muddy sand	Brown	Urchins, shell fragments
15/11/2021	20:12:01	FE6_05	NS	603	2	-		-	-	-
15/11/2021	20:28:04	FE6_05	NS	604	< 1	-		-	-	-
15/11/2021	21:22:48	FE6_05	NS	605	< 1	-		-	-	-
15/11/2021	21:37:21	FE6_05	NS	607	0	-		-	-	-
15/11/2021	21:53:33	FE6_06	FA	608	9	-	s	Coarse sand	Yellow	Shell fragments

Date	Time [UTC]	Station	Sample Rep	Fix No.	Sample Volume / depth* [L / cm]	Sediment Description (including stratigraphy)				Comments (fauna, smell, bioturbation, debris)
						Depth [cm]	Sediment Type	Sediment Description	Colour	
15/11/2021	22:21:41	FE6_07	FA	609	6	-	s	Coarse sand	Yellow	Shell fragments
15/11/2021	22:48:43	FE6_08	FA	610	9	-	s	Coarse sand	Yellow	Shell fragments
15/11/2021	23:12:52	FE6_09	FA	611	< 1	-		-	-	-
16/11/2021	01:09:25	FE6_10	FA	615	5	-	gS	Gravelly sand	Yellow	Small proportion of mud
16/11/2021	01:35:10	FE6_11	FA	616	6	-	gS	Gravelly sand	Yellow	Brittlestars, faunal tubes
16/11/2021	02:10:28	FE6_11	NS	617	3 cm	-		-	-	Low volume
16/11/2021	02:31:55	FE6_11	NS	618	-	-		-	-	Stone caught in jaws
16/11/2021	02:38:10	FE6_11	NS	619	4 cm	-		-	-	Low volume, moved 50m
16/11/2021	02:48:44	FE6_11	NS	620	-	-		-	-	Stone in jaw

Notes
UTC = Coordinated Universal Time
SOL = Start of line
EOL = End of line
FA = Fauna sample A
SC = Sediment chemistry
NS = No sample

* Sample depth recorded in cm for Day grab

C.4 Video and Photographic Log

Geodetic Parameters: WGS 84, UTM Zone 31 North							
Station	Point on Line	Video Coordinates		Length [m]	Still Nos.	Sediment Description	Fauna / Bioturbation / Debris
		Easting [m]	Northing [m]				
FE4_01	SOL	422 084.1	5 738 388.0	69	FE4_01_01-FE4_01_14	Gravelly sandy mud/muddy sand with varying proportions of cobbles and shell fragments. Sporadic small clumps of clay with piddock holes	Starfish (*Asterias rubens*), soft coral (*Alcyonium digitatum*), crab (*Inachus* sp.), hermit crabs (Paguridae), anemones (Actiniaria including Sagartiidae), bryozoans (Bryozoa including Flustridae and *Pentapora foliacea*), hydroids (*Nemertesia antennina*), faunal turf (Hydrozoa/Bryozoa)
	EOL	422 075.3	5 738 320.0				
FE4_02	SOL	423 696.1	5 739 158.0	55	FE4_02_01-FE4_02_15	Gravelly sandy mud/muddy sand with varying proportions of cobbles and shell fragments. Sporadic small clumps of clay with piddock holes	Starfish (*Asterias rubens*), sea urchins (*Psammechinus miliaris*), spider crab (*Inachus* sp.), sponge (Porifera), soft coral (*Alcyonium digitatum*), painted topshell (*Calliostoma zizyphinum*), anemones (Actiniaria including Sagartiidae and *Urticina* sp.), faunal turf (Hydrozoa/Bryozoa), encrusting bryozoans (Bryozoa), hydroids (Hydrozoa), faunal tubes (Polychaeta including *Spirobranchus* sp.)
	EOL	423 704.4	5 739 104.0				
FE4_03	SOL	425 304.3	5 739 864.0	16	FE4_03_01 - FE4_03_09	Gravelly muddy sand with varying proportions of cobbles, boulders and shell fragments	Starfish (*Asterias rubens*), anemones (Actiniaria including Sagartiidae), soft coral (*Alcyonium digitatum*), sponge (Porifera), faunal turf (Hydrozoa/Bryozoa), elasmobranch egg case
	EOL	425 307.4	5 739 848.0				
	SOL	425 307.4	5 739 848.0	46	FE4_03_10-FE4_03_23	Gravelly muddy sand with areas of clay with piddock holes, varying proportions of cobbles and shell fragments	Starfish (*Asterias rubens*), anemones (Actiniaria including *Urticina* sp. and Sagartiidae), spider crab (*Macropodia* sp.), scallops (*Aequipecten opercularis*), soft coral (*Alcyonium digitatum*), sponge (Porifera), faunal tubes (Polychaeta including *Spirobranchus* sp.), hydroids (Hydrozoa including *Nemertesia antennina*), encrusting bryozoans (Bryozoa), faunal turf

Geodetic Parameters: WGS 84, UTM Zone 31 North							
Station	Point on Line	Video Coordinates		Length [m]	Still Nos.	Sediment Description	Fauna / Bioturbation / Debris
		Easting [m]	Northing [m]				
	EOL	425 292.4	5 739 804.0				(Hydrozoa/Bryozoa), elasmobranch egg cases, goby (Gobiidae), fish (Pisces)
FE4_04	SOL	426 928.5	5 740 559.0	53	FE4_04_01 - FE4_04_19	Gravelly muddy sand with varying proportions of cobbles and shell fragments	Starfish (*Asterias rubens*), anemones (Actiniaria including *Urticina* sp. and Sagartiidae), hermit crab (Paguridae), sea urchins (*Psammechinus miliaris*), scallop (Pectinidae), soft coral (*Alcyonium digitatum*), topshell (*Calliostoma granulatum*), whelk (Buccinidae), ?sponge (Porifera), faunal tubes (Polychaeta including *Spirobranchus* sp.), ross worm crusts and tubes (*Sabellaria spinulosa*), encrusting bryozoans (Bryozoa), bryozoan (*Alcyonidium diaphanum*), hydroids (Hydrozoa possible Haleciidae), faunal turf (Hydrozoa/Bryozoa)
	EOL	426 916.1	5 740 507.0				
FE4_05	SOL	428 559.6	5 741 294.0	63	FE4_05_01 - FE4_05_19	Sandy muddy gravel with varying proportions of cobbles and shell fragments	Starfish (*Asterias rubens*), brittlestars (Ophiuroidea including areas of dense *Ophiothrix fragilis*), sea urchins (*Psammechinus miliaris*), scallop (*Aequipecten opercularis*), whelk (Buccinidae), soft coral (*Alcyonium digitatum*), anemones (Actiniaria including *Urticina* sp. and ?Sagartiidae), faunal tubes (Polychaeta including *Spirobranchus* sp.), encrusting bryozoans (Bryozoa), faunal turf (Hydrozoa/Bryozoa), small-spotted catshark (*Scyliorhinus canicula*)
	EOL	428 542.2	5 741 233.0				
FE4_08	SOL	433 570.9	5 743 180.0	62	FE4_08_01 - FE4_08_25	Gravelly muddy sand with cobbles and shell fragments	Poor visibility. Starfish (*Asterias rubens*) small-spotted catshark (*Scyliorhinus canicula*), faunal tubes (Serpulidae), soft coral (*Alcyonium digitatum*)
	EOL	433 551.2	5 743 121.0				

Geodetic Parameters: WGS 84, UTM Zone 31 North							
Station	Point on Line	Video Coordinates		Length [m]	Still Nos.	Sediment Description	Fauna / Bioturbation / Debris
		Easting [m]	Northing [m]				
FE5_01c	SOL	410 734.2	5 744 368.8	45	FE5_01_04 - FE5_01_10	Poor visibility, seabed not visible	Poor visibility, seabed not visible
	EOL	410 715.2	5 744 409.2				
FE5_09a	SOL	419 135.2	5 737 771.0	55	FE5_09a_01 - FE5_09a_18	Gravelly sandy mud/muddy sand with occasional cobbles and shell fragments	Dense coverage of brittlestars (Ophiuroidea and *Ophiothrix fragilis*), starfish (*Asterias rubens*), sea urchins (*Psammechinus miliaris*), hermit crabs (Paguridae),-anemones (Actiniaria), soft coral (*Alcyonium digitatum*), faunal turf (Hydrozoa/Bryozoa), faunal tubes (Polychaeta including *Spirobranchus* sp.)
	EOL	419 165.6	5 737 817.0				
FE7b_01a	SOL	381 527.4	5 742 282.7	60	FE7b_01a_01 - FE7b_01a_12	Poor visibility. Gravelly sandy mud/muddy sand and shell fragments	Poor visibility. Faunal turf (Hydrozoa/Bryozoa)
	EOL	381 564.9	5 742 329.2				
FE7b_02	SOL	381 481.1	5 742 416.6	60	FE7b_02_01 - FE7b_02_09	Poor visibility. Gravelly sandy mud/muddy sand and shell fragments	Poor visibility. Faunal turf (Hydrozoa/Bryozoa), ross worm (*Sabellaria spinulosa*)
	EOL	381 427.4	5 742 389.8				
FE7b_03	SOL	381 529.2	5 742 039.4	13	FE7b_03_01 - FE7b_03_12	Poor visibility. Gravelly sandy mud/muddy sand and shell fragments	Poor visibility. Faunal turf (Hydrozoa/Bryozoa)
	EOL	381 538.6	5 742 030.4				
FE7d_02	SOL	391 599.2	5 745 598.3	58	FE7d_02_01 - FE7d_02_08	Poor visibility, seabed not visible	Poor visibility, seabed not visible
	EOL	391 554.2	5 745 561.6				
FE7d_02a	SOL	390 654.6	5 745 557.4	50	FE7d_02a_01 - FE7d_02a_14	Poor visibility. Gravelly sand, cobbles and shell fragments	Poor visibility. ?ross worm (*Sabellaria spinulosa*) crust
	EOL	390 626.0	5 745 516.8				

Geodetic Parameters: WGS 84, UTM Zone 31 North							
Station	Point on Line	Video Coordinates		Length [m]	Still Nos.	Sediment Description	Fauna / Bioturbation / Debris
		Easting [m]	Northing [m]				
FE7d_03a	SOL	392 614.1	5 746 259.0	58	FE7d_03a_01 - FE7d_03a_16	Poor visibility. Possible gravelly sandy mud/muddy sand and shell fragments	Poor visibility. Bryozoan (*Flustra foliacea*)
	EOL	392 584.9	5 746 209.0				
FE7e_01a	SOL	392 908.4	5 748 203.0	55	FE7e_01a_01 - FE7e_01a_07	Poor visibility, seabed not visible	Poor visibility, seabed not visible
	EOL	392 881.4	5 748 155.0				
FE7e_03a_a	SOL	393 761.0	5 749 671.1	55	FE7e_03a_a_01 - FE7e_03a_a_16	Poor visibility. Sandy mud/muddy sand (?rippled) and shell fragments	Poor visibility. Faunal turf (Hydrozoa/Bryozoa), bryozoan (?*Vesicularia spinosa*)
	EOL	393 758.7	5 749 615.8				
FE7f_02a	SOL	395 971.5	5 750 593.6	67	FE7f_02a_01 - FE7f_02a_15	Poor visibility. Possible gravelly sand, cobbles and boulders	Poor visibility. Bryozoan (*Flustra foliacea*), soft coral (*Alcyonium digitatum*), faunal turf (Hydrozoa/Bryozoa), ?ross worm (*Sabellaria spinulosa*)
	EOL	395 941.7	5 750 533.2				

Notes
UTC = Coordinated Universal Time
? = Identification is uncertain

Appendix D

Sediment Particle Size and Grab Sample Photographs

Certificate of Analysis

Certificate Number	EP/22/4981	**Revision Number**	1
Job Number	200867		
Job Reference	RWE Five Estuaries		
Prepared For		**Prepared By**	
RWE		**Adam Burtonshaw** **Fugro GB Marine Limited** Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom	
		Phone: +44 (0) 2392 205500 **Email:** sediment@fugro.com **Web:** www.fugro.com	

Sampling Undertaken By	FGBML	**Sampling Date**	26/07/2021 – 27/07/2021, 09/11/2021 – 16/11/2021
Date of Receipt	27/07/2021, 18/11/2021	**Date of Analysis**	25/11/2021 – 14/01/2022
Sample Matrix	Marine Sediments		
Method Reference	Particle Size Distribution by Dry Sieving – EUAF-FGBM-SED-TM-001 based on NMBAQC's Best Practice Guidance - Particle Size Analysis (PSA) for Supporting Biological Analysis 2016 and EUAF-FGBM-SED-TM-002 based on BS 1377: Parts 1: 2016 and 2: 1990. Particle Size Distribution by Laser Diffraction using a Malvern Mastersizer 2000 and Hydro 2000G Dispersion Unit – EUAF-FGBM-SED-TM-006 based on NMBAQC's Best Practice Guidance - Particle Size Analysis (PSA) for Supporting Biological Analysis 2016 and BS ISO 13320: 2020.		
Test Results	Refer to pages 2-8 of 8 Refer to Excel results file for laser diffraction metadata.		
Laboratory Comments	**Deviating Codes:** None		
Authorised Signature	J. R. Hut		
Name	James Hutchinson		
Position	Sediment Laboratory Manager		
Issue Date	27/01/2022		

- Further information on methods of analysis may be obtained from the above address
- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
- Test results reported relate only to those items tested
- Test results reported specifically refer to sample(s) tested as received unless otherwise stated
- [Sub]Indicates subcontracted test
- [DS]Indicates relevant Deviating Code applies to test results

A UKAS TESTING LABORATORY

UKAS TESTING 0919

Registered in England: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB, UK
Registered in England No. 1135456 | VAT No. GB 579 3459 84

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	I_TR01_HW	I_TR01_MW	I_TR01_LW	I_TR02_HW	I_TR02_MW	I_TR02_LW	I_TR03_HW	I_TR03_MW	I_TR03_LW	I_TR04_HW	I_TR04_MW	I_TR04_LW	I_TR05_HW	I_TR05_MW	I_TR05_LW
LAB ID:	**WL039804**	**WL039805**	**WL039806**	**WL039807**	**WL039808**	**WL039809**	**WL039810**	**WL039811**	**WL039812**	**WL039813**	**WL039814**	**WL039815**	**WL039816**	**WL039817**	**WL039818**
Aperture [µm]	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**
63000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22400	0.00	0.00	0.00	0.00	0.00	9.31	0.00	7.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16000	0.00	7.50	0.00	0.00	0.00	0.00	0.00	7.49	4.39	0.00	0.00	0.00	0.00	5.08	0.00
11200	0.00	11.79	0.00	0.00	0.00	2.00	10.39	9.13	1.60	0.00	0.00	0.00	0.00	6.08	0.00
8000	3.20	2.57	0.00	1.06	0.00	0.40	8.24	7.72	0.90	0.00	0.00	0.00	0.00	7.45	0.00
5600	1.54	13.41	0.00	0.53	4.29	1.99	13.08	7.72	2.75	0.00	0.20	0.00	0.17	8.44	0.00
4000	1.57	11.86	0.00	1.30	3.21	1.05	8.47	7.73	1.84	0.08	0.11	0.00	0.08	5.75	0.00
2800	1.42	9.91	0.00	1.02	3.91	2.57	7.49	5.47	2.69	0.00	0.09	0.00	0.20	5.15	0.02
2000	1.63	5.71	0.02	1.12	3.90	3.16	3.21	4.75	4.31	0.06	0.24	0.00	0.32	4.90	0.00
1400	1.51	3.56	0.05	1.09	3.45	4.09	1.69	4.18	5.29	0.17	0.23	0.01	0.26	3.56	0.00
1000	1.87	4.22	0.08	1.40	3.62	5.03	1.24	2.86	4.94	0.21	0.39	0.01	0.27	2.38	0.00
707.00	14.76	9.55	0.24	14.82	10.36	10.59	1.83	2.63	6.35	0.00	0.02	0.00	0.01	0.43	0.00
500.00	29.67	9.63	8.20	28.34	17.62	15.96	9.03	7.24	12.96	3.77	3.94	0.56	4.05	4.62	0.56
353.60	28.63	6.71	32.22	29.29	21.43	18.76	17.15	11.55	19.53	26.82	27.18	16.19	30.95	15.39	16.16
250.00	12.63	3.00	40.51	16.23	17.83	15.72	13.91	9.89	19.29	44.90	44.76	48.88	47.03	19.89	48.87
176.80	1.56	0.60	17.22	3.77	8.79	7.90	4.11	3.82	10.83	21.93	21.03	31.02	15.98	9.72	31.06
125.00	0.00	0.00	1.45	0.03	1.60	1.48	0.16	0.30	2.32	2.05	1.81	3.33	0.66	1.16	3.33
88.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	I_TR06_MW	I_TR06_LW	I_TR07_HW	I_TR07_MW	I_TR07_LW	I_TR08_HW	I_TR08_MW	I_TR08_LW
LAB ID:	**WL039819**	**WL039820**	**WL039821**	**WL039822**	**WL039823**	**WL039824**	**WL039825**	**WL039826**
Aperture [µm]	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**
63000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31500	0.00	0.00	17.89	0.00	0.00	0.00	0.00	0.00
22400	0.00	0.00	7.17	0.00	0.00	18.70	0.00	0.00
16000	0.00	0.00	5.73	0.00	0.00	6.81	0.00	0.00
11200	0.00	0.00	7.12	3.58	0.00	8.96	9.32	0.00
8000	0.00	0.56	7.34	0.00	0.00	7.36	0.00	3.08
5600	0.00	0.00	8.11	2.23	0.00	6.72	0.00	5.28
4000	0.00	0.11	5.06	0.76	0.00	5.08	0.55	5.07
2800	0.02	0.04	3.70	0.35	0.00	3.65	0.58	5.27
2000	0.00	0.05	2.22	0.58	0.01	3.58	0.52	5.15
1400	0.03	0.09	1.73	0.52	0.01	2.59	0.57	4.83
1000	0.05	0.13	1.20	0.53	0.02	1.91	0.47	3.80
707.00	0.00	0.00	0.59	0.01	0.00	1.65	0.01	1.45
500.00	2.32	2.91	4.21	3.68	1.00	5.73	2.78	5.33
353.60	26.10	26.68	10.85	24.94	19.74	10.99	21.43	14.85
250.00	49.20	47.34	11.71	41.14	49.97	10.83	39.48	22.40
176.80	21.03	20.67	4.91	19.87	27.01	4.85	21.77	17.42
125.00	1.25	1.41	0.46	1.81	2.25	0.57	2.53	5.85
88.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
63.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	FE1_01	FE1_02	FE1_03	FE1_04	FE1_05	FE1_06	FE1_07	FE1_08	FE2_01	FE2_02	FE2_03	FE2_04	FE2_05	FE2_06	FE3_01
LAB ID:	**WL039831**	**WL039832**	**WL039833**	**WL039834**	**WL039835**	**WL039836**	**WL039837**	**WL039838**	**WL039839**	**WL039840**	**WL039841**	**WL039842**	**WL039843**	**WL039844**	**WL039845**
Aperture [µm]	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**
63000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31500	0.00	25.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22400	0.00	15.28	0.00	26.39	0.00	0.00	0.00	8.90	0.00	0.00	0.00	0.00	0.00	11.31	0.00
16000	0.00	0.00	0.00	0.00	0.00	6.76	3.87	0.00	18.04	0.00	0.00	0.00	0.00	8.67	6.42
11200	0.00	4.07	0.00	4.85	0.87	2.99	9.27	2.72	11.45	0.15	0.00	0.00	0.00	17.93	2.79
8000	3.21	4.91	0.30	4.17	0.36	5.42	6.87	3.64	16.21	0.00	0.62	0.20	0.00	5.21	4.37
5600	4.31	2.85	2.16	3.42	2.11	4.03	5.60	4.55	5.28	0.14	2.23	0.12	0.00	5.10	7.30
4000	2.98	2.36	2.57	1.79	1.63	2.95	3.31	2.59	5.01	0.60	1.98	0.24	0.09	4.45	3.16
2800	2.50	2.32	4.35	1.06	1.34	1.58	2.92	2.88	4.73	0.72	2.35	0.42	0.39	4.10	2.21
2000	2.80	2.02	5.21	0.60	2.20	1.23	1.92	2.36	3.40	1.46	2.98	0.65	0.53	2.45	1.56
1400	2.69	2.08	5.44	0.74	2.16	1.04	1.43	2.05	1.86	2.54	2.99	1.29	1.11	1.61	1.30
1000	3.02	2.28	5.44	0.74	2.95	0.85	0.88	2.06	1.07	4.46	2.82	3.33	2.02	1.05	1.81
707.00	7.57	10.02	24.45	5.39	20.75	5.33	7.04	16.17	3.98	23.73	15.32	19.52	9.79	3.74	15.59
500.00	9.58	10.69	31.44	19.36	35.11	17.88	23.94	25.78	8.35	35.75	37.64	36.71	33.64	10.96	23.63
353.60	7.58	6.67	16.42	22.33	24.70	25.96	24.90	19.83	8.93	24.57	26.75	29.19	38.26	12.51	17.23
250.00	3.47	1.95	2.22	8.32	5.74	17.83	7.74	6.22	4.64	5.81	4.30	8.11	13.46	5.26	5.10
176.80	0.77	0.07	0.00	0.49	0.08	4.75	0.31	0.24	0.82	0.07	0.01	0.22	0.71	0.51	0.23
125.00	0.20	0.01	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88.39	0.64	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
63.00	1.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.18	0.64
44.20	2.66	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.31	0.48
31.30	3.52	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.19	0.24
22.10	4.14	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.14	0.27
15.60	4.35	0.45	0.00	0.02	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.20	0.42
11.00	4.35	0.58	0.00	0.06	0.00	0.16	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.30	0.52
7.80	4.30	0.68	0.00	0.06	0.00	0.23	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.40	0.59
5.50	4.51	0.75	0.00	0.06	0.00	0.24	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.53	0.69
3.90	4.49	0.71	0.00	0.05	0.00	0.23	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.61	0.75
2.75	4.20	0.60	0.00	0.05	0.00	0.20	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.64	0.73
1.95	3.34	0.41	0.00	0.04	0.00	0.16	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.54	0.59
1.38	2.47	0.26	0.00	0.00	0.00	0.06	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.42	0.43
0.98	1.84	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.30	0.31
0.69	1.51	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22	0.24
0.49	1.05	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.14	0.16
0.34	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.02	0.00
0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	FE3_02	FE3_03	FE4_01	FE4_02	FE4_03	FE4_04	FE4_05	FE4_06	FE4_07	FE4_08	FE5_01	FE5_02	FE5_03	FE5_04	FE5_05
LAB ID:	**WL039846**	**WL039847**	**WL039848**	**WL039849**	**WL039850**	**WL039851**	**WL039852**	**WL039853**	**WL039854**	**WL039855**	**WL039856**	**WL039857**	**WL039858**	**WL039859**	**WL039860**
Aperture [µm]	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**
63000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31500	33.81	0.00	30.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22400	8.97	21.98	0.00	0.00	28.01	14.35	42.35	0.00	38.71	0.00	0.00	0.00	0.00	0.00	18.03
16000	11.91	13.68	3.90	5.83	0.00	6.66	3.08	5.81	0.00	0.00	10.70	0.00	0.00	0.00	23.05
11200	6.63	2.96	4.23	5.80	8.35	0.00	6.24	0.00	2.40	2.81	2.54	10.24	2.99	4.22	1.21
8000	5.52	2.81	5.13	7.43	2.30	2.23	1.75	1.77	3.78	1.56	6.94	0.84	4.95	7.01	6.01
5600	2.75	5.65	3.86	2.33	3.26	2.98	1.16	3.72	5.92	5.66	3.88	1.76	5.10	10.72	3.92
4000	1.79	3.57	1.95	2.59	2.13	2.58	1.58	5.96	3.05	2.22	3.92	2.14	2.73	2.40	2.16
2800	1.22	2.15	1.54	3.68	1.94	1.57	1.64	6.56	1.71	2.83	1.69	1.17	1.66	2.01	2.66
2000	1.34	1.19	1.19	3.11	1.62	1.80	1.76	6.88	1.84	3.36	1.89	1.01	1.41	2.51	2.90
1400	1.14	0.83	1.03	3.53	1.95	2.37	2.06	7.45	1.76	4.51	1.82	0.53	1.12	2.33	3.05
1000	1.09	0.90	1.11	4.55	2.29	3.15	2.41	8.92	1.39	5.78	1.84	0.49	1.32	2.63	2.84
707.00	6.21	12.27	2.53	10.04	5.26	12.27	8.15	22.82	3.95	11.41	5.05	1.20	5.22	7.60	6.59
500.00	9.38	15.17	3.45	11.51	5.47	14.47	8.61	20.63	6.97	12.75	7.06	2.03	7.38	12.42	7.32
353.60	6.57	9.94	3.80	10.90	4.32	11.40	6.24	8.66	8.34	9.13	7.17	2.52	7.42	12.55	5.55
250.00	1.66	2.89	3.20	8.16	2.60	5.40	2.90	0.82	6.28	3.67	5.51	2.28	5.29	7.38	2.62
176.80	0.01	0.14	1.94	4.23	1.18	1.14	0.75	0.00	2.57	0.51	4.01	1.52	2.80	2.35	0.69
125.00	0.00	0.00	0.91	1.14	0.49	0.02	0.15	0.00	0.31	0.01	3.75	0.97	1.45	0.87	0.37
88.39	0.00	0.28	0.55	0.05	0.45	0.21	0.26	0.00	0.00	0.47	3.72	0.98	1.17	1.47	0.73
63.00	0.00	0.42	0.63	0.29	0.75	0.71	0.37	0.00	0.06	1.08	2.88	1.45	1.33	1.95	0.88
44.20	0.00	0.23	0.93	0.73	1.24	0.96	0.39	0.00	0.37	1.51	1.91	2.36	1.88	1.74	0.79
31.30	0.00	0.10	1.25	0.85	1.62	1.00	0.40	0.00	0.47	1.71	1.34	3.24	2.62	1.19	0.62
22.10	0.00	0.14	1.63	0.88	1.96	1.14	0.49	0.00	0.54	1.96	1.49	4.24	3.50	1.04	0.60
15.60	0.00	0.23	1.98	0.98	2.20	1.30	0.60	0.00	0.69	2.21	1.92	5.32	4.02	1.20	0.69
11.00	0.00	0.29	2.25	1.16	2.38	1.45	0.69	0.00	0.89	2.50	2.36	6.66	4.09	1.45	0.79
7.80	0.00	0.33	2.46	1.34	2.50	1.54	0.78	0.00	1.04	2.82	2.70	7.90	3.96	1.67	0.88
5.50	0.00	0.38	2.83	1.56	2.72	1.67	0.89	0.00	1.20	3.32	3.03	8.92	4.18	1.95	0.98
3.90	0.00	0.40	3.07	1.63	2.77	1.69	0.95	0.00	1.26	3.59	2.99	8.60	4.38	2.07	0.98
2.75	0.00	0.37	3.09	1.56	2.65	1.60	0.92	0.00	1.22	3.54	2.64	7.35	4.41	2.01	0.90
1.95	0.00	0.28	2.60	1.26	2.20	1.31	0.76	0.00	1.01	2.91	1.93	5.25	3.80	1.64	0.69
1.38	0.00	0.19	2.00	0.95	1.72	1.00	0.58	0.00	0.76	2.18	1.29	3.50	3.04	1.23	0.50
0.98	0.00	0.13	1.49	0.71	1.34	0.76	0.42	0.00	0.57	1.57	0.86	2.36	2.38	0.91	0.37
0.69	0.00	0.08	1.24	0.59	1.13	0.63	0.34	0.00	0.46	1.23	0.65	1.78	2.04	0.74	0.31
0.49	0.00	0.00	0.90	0.43	0.81	0.45	0.23	0.00	0.33	0.84	0.42	1.13	1.52	0.53	0.22
0.34	0.00	0.00	0.45	0.20	0.38	0.20	0.10	0.00	0.14	0.34	0.10	0.27	0.81	0.23	0.09
0.24	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	FE5_06	FE5_07	FE5_08	FE5_09	FE5_10	FE6_01	FE6_02	FE6_04	FE6_06	FE6_07	FE6_08	FE6_09	FE6_10	FE6_11	FE7b_02
LAB ID:	WL039861	WL039862	WL039863	WL039864	WL039865	WL039866	WL039867	WL039868	WL039869	WL039870	WL039871	WL039872	WL039873	WL039874	WL039875
Aperture [µm]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]	Fractional [%]
63000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00	0.00	43.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.88	0.00	0.00
22400	0.00	0.00	0.00	0.00	0.00	20.49	6.63	0.00	0.00	0.00	0.00	0.00	8.60	0.00	0.00
16000	4.91	19.59	0.00	0.00	0.00	11.14	13.65	14.39	0.00	0.00	0.00	9.95	8.14	0.00	1.38
11200	9.04	3.10	6.24	3.86	2.23	18.34	0.87	18.73	0.00	0.00	0.00	10.71	6.29	8.44	6.26
8000	5.00	13.88	7.31	0.00	6.69	8.50	3.82	8.20	0.16	1.90	0.14	10.21	2.63	2.34	4.50
5600	4.80	6.33	5.69	1.39	2.51	6.02	2.80	6.90	1.28	3.39	0.44	3.29	2.07	4.86	1.99
4000	2.11	1.82	3.38	1.18	3.05	2.38	1.76	4.51	4.84	2.94	0.41	1.62	1.22	3.86	3.86
2800	2.56	2.39	2.94	1.14	2.48	1.40	1.97	3.65	7.18	2.64	0.60	1.77	1.49	2.90	2.49
2000	1.37	1.92	2.04	1.69	1.86	1.14	1.55	2.58	14.36	3.66	1.11	1.36	0.90	3.14	2.47
1400	1.12	1.75	1.72	1.62	2.04	0.89	1.38	2.22	17.07	5.89	4.70	1.37	0.78	3.70	2.60
1000	1.15	1.77	1.47	1.90	2.28	0.86	1.36	2.42	20.73	6.86	22.13	1.83	0.71	5.58	2.31
707.00	3.66	5.44	1.42	3.61	7.39	2.30	2.78	7.03	19.23	19.07	31.91	3.68	1.53	14.68	3.27
500.00	9.53	7.42	1.66	3.55	12.33	2.59	3.23	8.89	10.84	23.12	23.08	7.80	2.11	15.52	3.77
353.60	14.60	7.78	1.58	3.07	15.39	2.50	2.73	8.16	2.55	19.04	10.70	13.69	3.87	12.30	3.33
250.00	12.54	5.89	1.25	2.38	12.87	2.62	1.80	5.39	0.05	9.54	2.97	16.27	6.49	7.67	2.28
176.80	5.34	2.88	0.82	1.52	6.12	3.14	1.33	2.60	0.12	1.95	0.71	11.45	7.69	4.34	1.74
125.00	0.64	0.68	0.54	0.72	1.00	3.52	1.49	1.09	0.57	0.00	0.61	3.87	5.90	2.76	2.77
88.39	0.00	0.04	0.62	0.43	0.00	3.13	1.65	0.62	0.40	0.00	0.46	0.18	2.60	1.89	4.97
63.00	0.18	0.33	1.10	0.82	0.08	2.09	1.32	0.47	0.02	0.00	0.04	0.00	0.40	1.07	6.44
44.20	0.94	0.72	1.98	1.86	0.78	1.18	0.80	0.32	0.00	0.00	0.00	0.00	0.00	0.51	6.63
31.30	1.19	0.87	2.77	3.02	1.14	0.62	0.37	0.17	0.00	0.00	0.00	0.00	0.13	0.28	5.12
22.10	1.29	0.99	3.50	4.19	1.24	0.50	0.26	0.12	0.04	0.00	0.00	0.00	0.27	0.31	3.90
15.60	1.49	1.14	4.13	5.08	1.41	0.51	0.30	0.14	0.06	0.00	0.00	0.00	0.18	0.37	3.33
11.00	1.78	1.33	4.92	5.76	1.70	0.52	0.33	0.17	0.07	0.00	0.00	0.05	0.10	0.40	3.30
7.80	2.01	1.52	5.85	6.36	2.01	0.52	0.35	0.19	0.08	0.00	0.00	0.17	0.11	0.42	3.39
5.50	2.28	1.75	7.00	7.36	2.40	0.56	0.38	0.22	0.09	0.00	0.00	0.21	0.16	0.48	3.58
3.90	2.37	1.84	7.35	7.92	2.57	0.58	0.39	0.23	0.10	0.00	0.00	0.20	0.19	0.52	3.50
2.75	2.26	1.79	6.88	7.85	2.48	0.56	0.38	0.21	0.10	0.00	0.00	0.16	0.18	0.51	3.20
1.95	1.83	1.49	5.33	6.54	1.98	0.45	0.31	0.17	0.05	0.00	0.00	0.12	0.14	0.42	2.50
1.38	1.36	1.15	3.78	4.99	1.42	0.34	0.23	0.12	0.00	0.00	0.00	0.02	0.11	0.31	1.81
0.98	1.01	0.88	2.65	3.72	1.01	0.25	0.17	0.08	0.00	0.00	0.00	0.00	0.08	0.22	1.31
0.69	0.83	0.74	2.08	3.08	0.79	0.20	0.13	0.02	0.00	0.00	0.00	0.00	0.04	0.17	1.05
0.49	0.58	0.54	1.42	2.25	0.54	0.14	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.71
0.34	0.25	0.25	0.55	1.10	0.21	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
0.24	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	FE7b_04	FE7b_05	FE7b_06	FE7c_01	FE7c_02
LAB ID:	**WL039876**	**WL039877**	**WL039878**	**WL039879**	**WL039880**
Aperture [µm]	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**
63000	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00
31500	0.00	0.00	0.00	57.52	0.00
22400	0.00	27.02	0.00	17.56	0.00
16000	0.00	0.00	0.00	0.00	22.51
11200	0.00	3.42	0.00	2.52	18.37
8000	0.00	4.70	2.83	1.54	4.05
5600	0.69	3.28	3.20	1.08	3.68
4000	1.21	2.40	2.61	0.78	2.90
2800	0.40	1.24	1.94	0.65	1.24
2000	0.50	1.36	1.15	0.49	1.36
1400	0.41	1.03	1.48	0.40	1.12
1000	0.53	0.90	1.91	0.44	1.22
707.00	0.93	2.06	4.75	1.28	2.69
500.00	1.39	3.20	6.43	1.96	3.56
353.60	1.41	3.56	6.58	1.97	3.46
250.00	1.09	2.86	5.23	1.32	2.57
176.80	0.81	1.93	3.73	0.76	2.02
125.00	0.98	1.88	3.54	0.85	2.64
88.39	1.94	2.85	4.62	1.27	3.74
63.00	3.44	3.82	5.52	1.37	3.92
44.20	5.29	4.31	5.82	1.11	3.22
31.30	6.23	3.74	4.91	0.66	2.00
22.10	6.75	3.13	4.12	0.44	1.37
15.60	7.12	2.74	3.62	0.41	1.25
11.00	7.87	2.64	3.48	0.45	1.34
7.80	8.71	2.65	3.45	0.48	1.42
5.50	9.53	2.75	3.60	0.51	1.53
3.90	9.12	2.62	3.51	0.51	1.53
2.75	7.84	2.32	3.24	0.47	1.45
1.95	5.66	1.77	2.59	0.38	1.17
1.38	3.80	1.28	1.96	0.28	0.88
0.98	2.60	0.96	1.52	0.21	0.67
0.69	2.03	0.81	1.31	0.17	0.56
0.49	1.33	0.57	0.95	0.12	0.40
0.34	0.37	0.21	0.39	0.04	0.16
0.24	0.00	0.00	0.00	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00
TOTAL:	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

TEST RESULTS

Test Results: Particle Size Distribution by Dry Sieving (63000 - 1000 µm) and Laser Diffraction (< 1000 - < 0.04 µm) @ 0.5 Phi Intervals
Job Number: 200867
Job Reference: RWE Five Estuaries

SAMPLE ID:	**FE7c_03**	**FE7c_04**	**FE7d_01**	**FE7d_03**	**FE7e_01**	**FE7e_02**	**FE7e_03**	**FE7f_01**	**FE7g_01**	**FE7g_02**	**FE7g_03**
LAB ID:	**WL039881**	**WL039882**	**WL039883**	**WL039884**	**WL039885**	**WL039886**	**WL039887**	**WL039888**	**WL039889**	**WL039890**	**WL039891**
Aperture [µm]	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**	**Fractional [%]**
63000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31500	0.00	0.00	0.00	19.93	0.00	0.00	0.00	0.00	29.82	0.00	0.00
22400	22.03	0.00	23.92	32.04	12.55	0.00	37.03	19.27	0.00	0.00	0.00
16000	12.07	0.00	15.00	8.44	28.37	0.00	0.00	9.14	6.52	0.00	0.00
11200	9.16	0.00	2.43	4.04	12.23	0.00	3.60	15.48	10.08	0.00	0.00
8000	4.65	0.00	2.31	1.78	3.12	0.00	4.80	6.34	6.42	0.00	0.00
5600	4.78	0.00	3.46	2.21	0.62	0.00	2.80	3.05	6.94	0.00	0.19
4000	2.68	0.00	2.21	1.65	1.34	0.00	1.28	1.48	3.92	0.00	0.18
2800	2.14	0.04	1.53	1.14	1.34	0.02	1.74	0.80	2.33	0.08	0.01
2000	1.70	0.03	1.06	1.16	1.50	0.05	0.73	0.42	1.99	0.09	0.06
1400	1.39	0.03	1.00	1.26	1.18	0.03	0.58	0.15	1.83	0.20	0.07
1000	1.37	0.05	0.95	1.47	0.88	0.07	0.61	0.09	2.16	0.34	0.07
707.00	3.12	0.14	1.88	4.56	1.57	0.32	1.39	0.00	5.13	2.05	0.21
500.00	3.96	0.09	2.22	6.58	2.40	0.36	4.61	0.58	6.24	7.78	5.05
353.60	3.62	0.01	2.20	6.24	3.33	1.34	8.89	5.54	5.94	14.05	13.86
250.00	2.52	0.28	2.29	3.64	3.94	4.21	10.72	13.85	4.48	15.61	18.94
176.80	1.92	4.22	3.04	1.09	4.06	8.44	8.18	15.02	2.66	11.24	15.44
125.00	2.44	11.77	4.26	0.20	3.94	11.54	3.85	7.28	1.29	5.92	7.86
88.39	3.25	17.65	4.93	0.42	3.56	11.38	1.12	1.07	0.60	3.83	3.08
63.00	3.15	16.42	4.28	0.60	2.72	8.49	0.59	0.00	0.34	4.00	2.20
44.20	2.40	10.88	3.09	0.44	1.85	5.96	0.91	0.00	0.23	4.27	2.81
31.30	1.42	4.88	1.87	0.16	1.09	4.38	0.93	0.00	0.14	3.43	2.88
22.10	1.01	2.85	1.46	0.07	0.82	4.36	0.71	0.00	0.09	2.81	2.86
15.60	0.99	3.27	1.52	0.10	0.81	4.87	0.56	0.00	0.09	2.82	3.08
11.00	1.07	4.09	1.70	0.14	0.86	5.44	0.59	0.00	0.11	3.26	3.47
7.80	1.12	4.37	1.83	0.15	0.90	5.71	0.68	0.07	0.13	3.58	3.64
5.50	1.18	4.41	1.97	0.14	0.96	5.81	0.75	0.14	0.14	3.68	3.60
3.90	1.17	4.03	1.92	0.12	0.96	5.20	0.70	0.13	0.14	3.28	3.14
2.75	1.08	3.42	1.73	0.10	0.89	4.21	0.58	0.09	0.11	2.66	2.53
1.95	0.85	2.47	1.32	0.07	0.70	2.87	0.41	0.02	0.08	1.83	1.76
1.38	0.62	1.67	0.93	0.05	0.52	1.84	0.27	0.00	0.04	1.19	1.15
0.98	0.45	1.16	0.66	0.00	0.38	1.25	0.18	0.00	0.00	0.81	0.77
0.69	0.37	0.95	0.54	0.00	0.31	1.02	0.13	0.00	0.00	0.65	0.60
0.49	0.25	0.64	0.37	0.00	0.22	0.69	0.05	0.00	0.00	0.43	0.39
0.34	0.08	0.15	0.11	0.00	0.06	0.16	0.00	0.00	0.00	0.10	0.08
0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
< 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Intertidal Core Samples PSD

I_TR01_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	3.20	3.20
5600	-2.5	1.54	4.75
4000	-2.0	1.57	6.31
2800	-1.5	1.42	7.73
2000	-1.0	1.63	9.36
1400	-0.5	1.51	10.88
1000	0.0	1.87	12.75
707.00	0.5	14.76	27.51
500.00	1.0	29.67	57.18
353.60	1.5	28.63	85.81
250.00	2.0	12.63	98.44
176.80	2.5	1.56	100.00
125.00	3.0	0.00	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.99	Moderately Sorted
Skewness	-0.34	Very Coarse Skewed
Kurtosis	1.95	Very Leptokurtic
Mean [µm]	566.76	Coarse Sand
Mean [phi]	0.82	
Median [µm]	543.70	Coarse Sand
Median [phi]	0.88	
Gravel [%]	9.36	Gravelly Sand
Sand [%]	90.64	
Mud [%]	0.00	

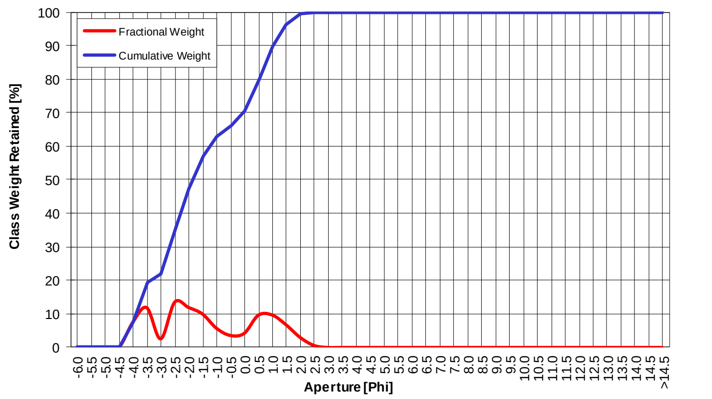
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR01_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	7.50	7.50
11200	-3.5	11.79	19.29
8000	-3.0	2.57	21.85
5600	-2.5	13.41	35.26
4000	-2.0	11.86	47.12
2800	-1.5	9.91	57.03
2000	-1.0	5.71	62.74
1400	-0.5	3.56	66.30
1000	0.0	4.22	70.52
707.00	0.5	9.55	80.07
500.00	1.0	9.63	89.69
353.60	1.5	6.71	96.40
250.00	2.0	3.00	99.40
176.80	2.5	0.60	100.00
125.00	3.0	0.00	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.93	Poorly Sorted
Skewness	0.17	Fine Skewed
Kurtosis	0.73	Platykurtic
Mean [µm]	3013.92	Granule
Mean [phi]	-1.59	
Median [µm]	3606.23	Granule
Median [phi]	-1.85	
Gravel [%]	62.74	Sandy Gravel
Sand [%]	37.26	
Mud [%]	0.00	



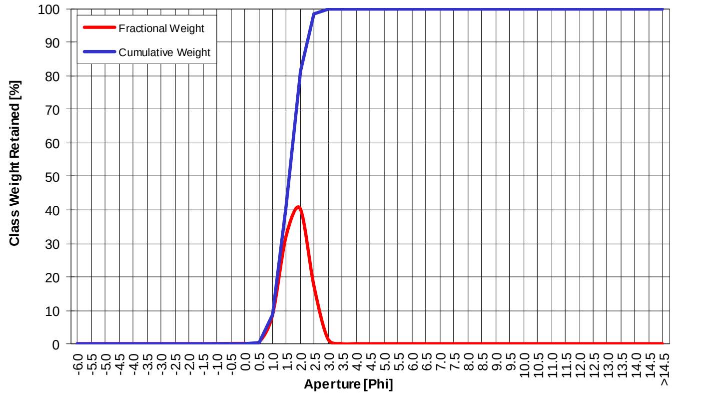
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR01_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.00	0.00
2000	-1.0	0.02	0.02
1400	-0.5	0.05	0.08
1000	0.0	0.08	0.16
707.00	0.5	0.24	0.39
500.00	1.0	8.20	8.60
353.60	1.5	32.22	40.82
250.00	2.0	40.51	81.34
176.80	2.5	17.22	98.55
125.00	3.0	1.45	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.49	Well Sorted
Skewness	-0.03	Symmetrical
Kurtosis	0.99	Mesokurtic
Mean [µm]	329.48	Medium Sand
Mean [phi]	1.60	
Median [µm]	326.89	Medium Sand
Median [phi]	1.61	
Gravel [%]	0.02	Slightly Gravelly Sand
Sand [%]	99.98	
Mud [%]	0.00	

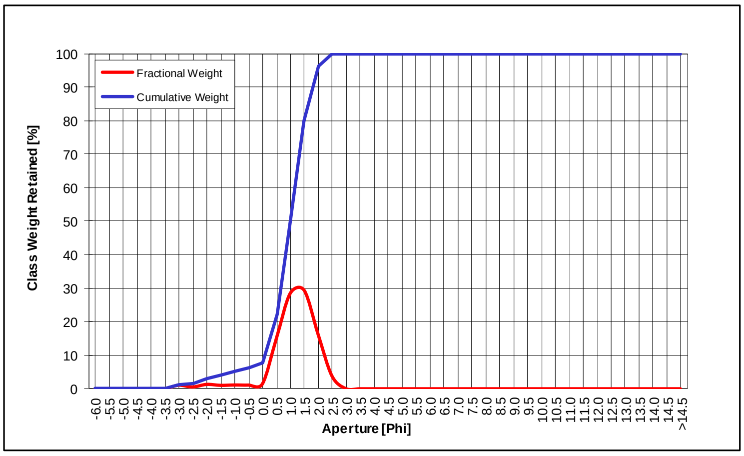


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR02_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	1.06	1.06
5600	-2.5	0.53	1.59
4000	-2.0	1.30	2.88
2800	-1.5	1.02	3.90
2000	-1.0	1.12	5.02
1400	-0.5	1.09	6.11
1000	0.0	1.40	7.52
707.00	0.5	14.82	22.34
500.00	1.0	28.34	50.68
353.60	1.5	29.29	79.96
250.00	2.0	16.23	96.20
176.80	2.5	3.77	99.97
125.00	3.0	0.03	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.78	Moderately Sorted
Skewness	-0.20	Coarse Skewed
Kurtosis	1.40	Leptokurtic
Mean [µm]	511.87	Coarse Sand
Mean [phi]	0.97	
Median [µm]	504.17	Coarse Sand
Median [phi]	0.99	
Gravel [%]	5.02	Gravelly Sand
Sand [%]	94.98	
Mud [%]	0.00	

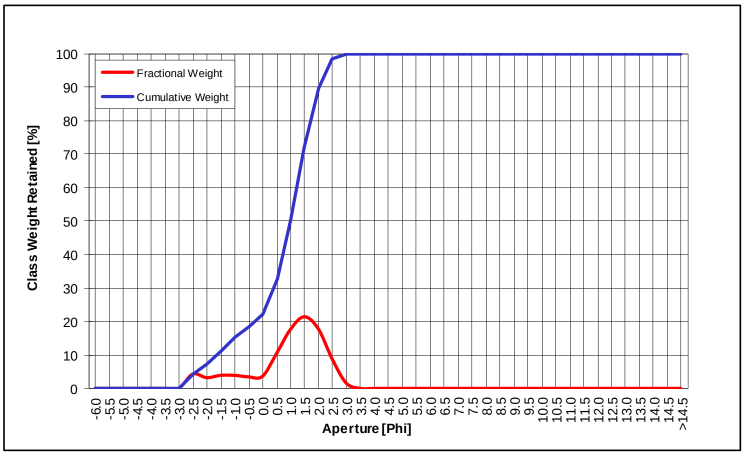


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR02_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	4.29	4.29
4000	-2.0	3.21	7.50
2800	-1.5	3.91	11.41
2000	-1.0	3.90	15.30
1400	-0.5	3.45	18.75
1000	0.0	3.62	22.37
707.00	0.5	10.36	32.72
500.00	1.0	17.62	50.34
353.60	1.5	21.43	71.77
250.00	2.0	17.83	89.61
176.80	2.5	8.79	98.40
125.00	3.0	1.60	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.39	Poorly Sorted
Skewness	-0.41	Very Coarse Skewed
Kurtosis	1.31	Leptokurtic
Mean [µm]	639.20	Coarse Sand
Mean [phi]	0.65	
Median [µm]	503.39	Coarse Sand
Median [phi]	0.99	
Gravel [%]	15.30	Gravelly Sand
Sand [%]	84.70	
Mud [%]	0.00	



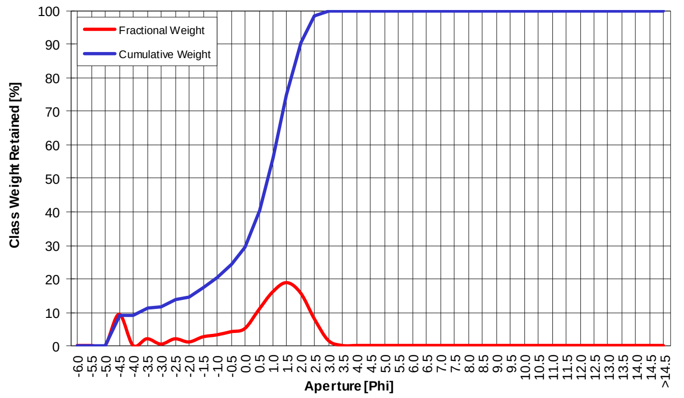
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR02_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	9.31	9.31
16000	-4.0	0.00	9.31
11200	-3.5	2.00	11.31
8000	-3.0	0.40	11.71
5600	-2.5	1.99	13.70
4000	-2.0	1.05	14.74
2800	-1.5	2.57	17.31
2000	-1.0	3.16	20.47
1400	-0.5	4.09	24.56
1000	0.0	5.03	29.59
707.00	0.5	10.59	40.18
500.00	1.0	15.96	56.14
353.60	1.5	18.76	74.90
250.00	2.0	15.72	90.62
176.80	2.5	7.90	98.52
125.00	3.0	1.48	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.94	Poorly Sorted
Skewness	-0.51	Very Coarse Skewed
Kurtosis	1.47	Leptokurtic
Mean [µm]	821.81	Coarse Sand
Mean [phi]	0.28	
Median [µm]	571.28	Coarse Sand
Median [phi]	0.81	
Gravel [%]	20.47	Gravelly Sand
Sand [%]	79.53	
Mud [%]	0.00	



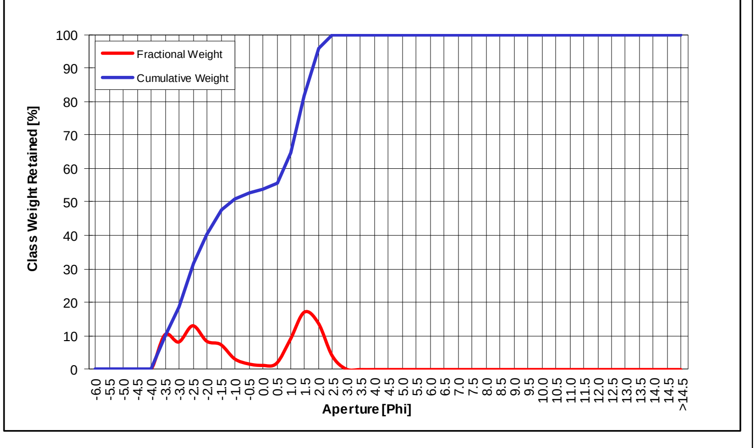
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR03_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	10.39	10.39
8000	-3.0	8.24	18.63
5600	-2.5	13.08	31.71
4000	-2.0	8.47	40.18
2800	-1.5	7.49	47.67
2000	-1.0	3.21	50.88
1400	-0.5	1.69	52.58
1000	0.0	1.24	53.82
707.00	0.5	1.83	55.65
500.00	1.0	9.03	64.68
353.60	1.5	17.15	81.82
250.00	2.0	13.91	95.73
176.80	2.5	4.11	99.84
125.00	3.0	0.16	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.05	Very Poorly Sorted
Skewness	0.12	Fine Skewed
Kurtosis	0.58	Very Platykurtic
Mean [µm]	1870.45	Very Coarse Sand
Mean [phi]	-0.90	
Median [µm]	2193.75	Granule
Median [phi]	-1.13	
Gravel [%]	50.88	Sandy Gravel
Sand [%]	49.12	
Mud [%]	0.00	



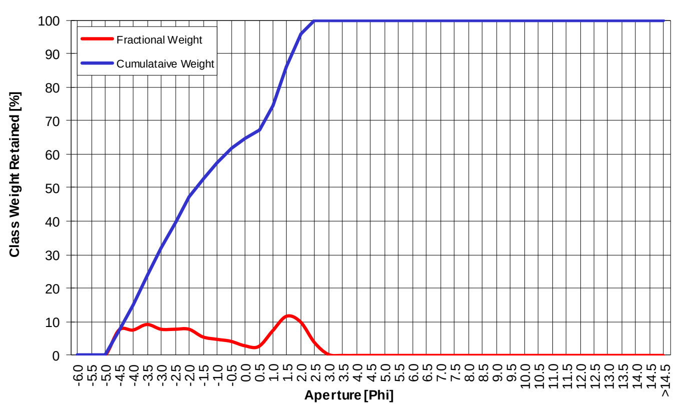
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR03_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	7.52	7.52
16000	-4.0	7.49	15.01
11200	-3.5	9.13	24.14
8000	-3.0	7.72	31.86
5600	-2.5	7.72	39.58
4000	-2.0	7.73	47.31
2800	-1.5	5.47	52.78
2000	-1.0	4.75	57.53
1400	-0.5	4.18	61.71
1000	0.0	2.86	64.57
707.00	0.5	2.63	67.20
500.00	1.0	7.24	74.44
353.60	1.5	11.55	85.99
250.00	2.0	9.89	95.88
176.80	2.5	3.82	99.70
125.00	3.0	0.30	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.34	Very Poorly Sorted
Skewness	0.15	Fine Skewed
Kurtosis	0.61	Very Platykurtic
Mean [µm]	2686.40	Granule
Mean [phi]	-1.43	
Median [µm]	3356.00	Granule
Median [phi]	-1.75	
Gravel [%]	57.53	Sandy Gravel
Sand [%]	38.29	
Mud [%]	0.00	



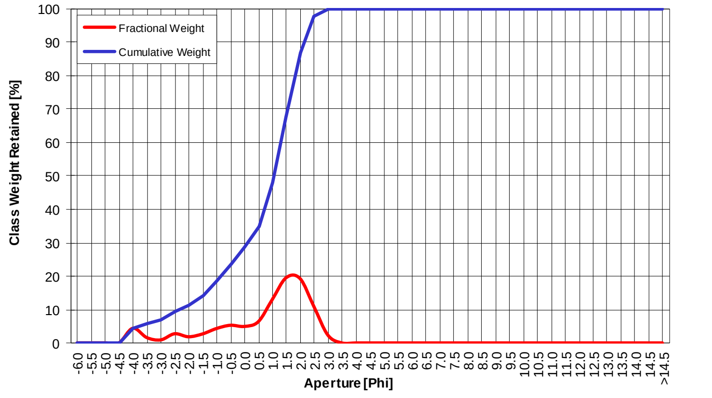
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR03_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	4.39	4.39
11200	-3.5	1.60	5.99
8000	-3.0	0.90	6.90
5600	-2.5	2.75	9.65
4000	-2.0	1.84	11.49
2800	-1.5	2.69	14.18
2000	-1.0	4.31	18.49
1400	-0.5	5.29	23.78
1000	0.0	4.94	28.72
707.00	0.5	6.35	35.07
500.00	1.0	12.96	48.03
353.60	1.5	19.53	67.55
250.00	2.0	19.29	86.84
176.80	2.5	10.83	97.68
125.00	3.0	2.32	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.74	Poorly Sorted
Skewness	-0.51	Very Coarse Skewed
Kurtosis	1.23	Leptokurtic
Mean [µm]	675.73	Coarse Sand
Mean [phi]	0.57	
Median [µm]	482.80	Medium Sand
Median [phi]	1.05	
Gravel [%]	18.49	Gravelly Sand
Sand [%]	81.51	
Mud [%]	0.00	

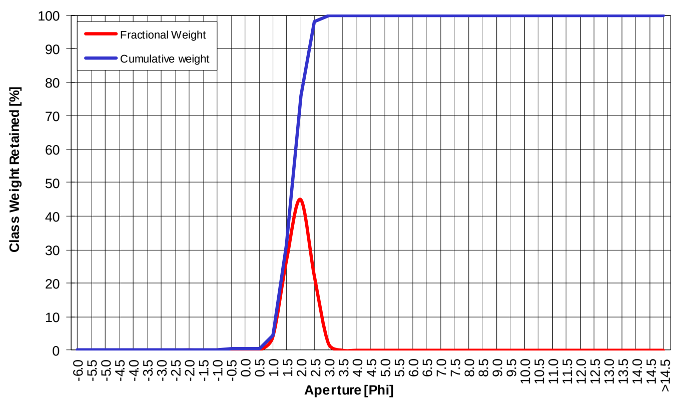


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR04_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.08	0.08
2800	-1.5	0.00	0.08
2000	-1.0	0.06	0.14
1400	-0.5	0.17	0.31
1000	0.0	0.21	0.52
707.00	0.5	0.00	0.52
500.00	1.0	3.77	4.29
353.60	1.5	26.82	31.11
250.00	2.0	44.90	76.02
176.80	2.5	21.93	97.95
125.00	3.0	2.05	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.46	Well Sorted
Skewness	0.00	Symmetrical
Kurtosis	0.97	Mesokurtic
Mean [µm]	307.06	Medium Sand
Mean [phi]	1.70	
Median [µm]	305.62	Medium Sand
Median [phi]	1.71	
Gravel [%]	0.14	Slightly Gravelly Sand
Sand [%]	99.86	
Mud [%]	0.00	



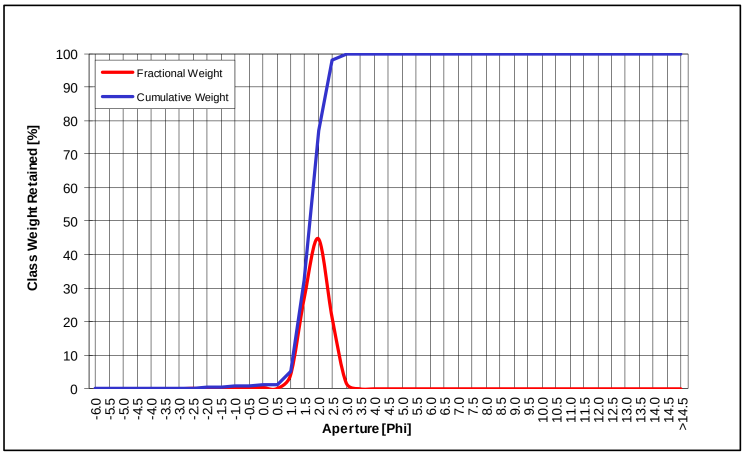
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR04_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.20	0.20
4000	-2.0	0.11	0.31
2800	-1.5	0.09	0.40
2000	-1.0	0.24	0.64
1400	-0.5	0.23	0.87
1000	0.0	0.39	1.26
707.00	0.5	0.02	1.27
500.00	1.0	3.94	5.21
353.60	1.5	27.18	32.40
250.00	2.0	44.76	77.16
176.80	2.5	21.03	98.19
125.00	3.0	1.81	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.46	Well Sorted
Skewness	-0.02	Symmetrical
Kurtosis	0.97	Mesokurtic
Mean [µm]	310.83	Medium Sand
Mean [phi]	1.69	
Median [µm]	308.53	Medium Sand
Median [phi]	1.70	
Gravel [%]	0.64	Slightly Gravelly Sand
Sand [%]	99.36	
Mud [%]	0.00	

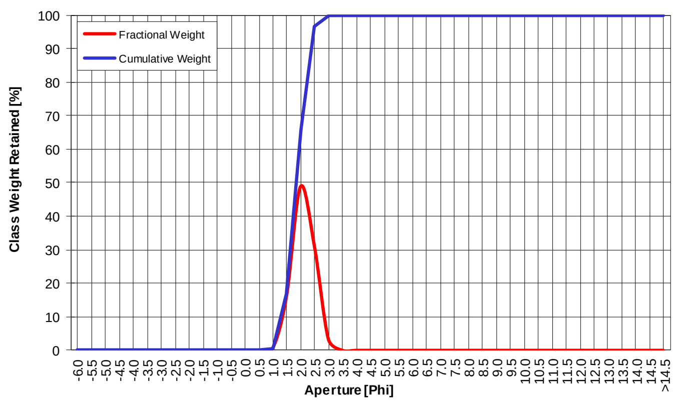


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR04_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.00	0.00
2000	-1.0	0.00	0.00
1400	-0.5	0.01	0.01
1000	0.0	0.01	0.01
707.00	0.5	0.00	0.01
500.00	1.0	0.56	0.57
353.60	1.5	16.19	16.76
250.00	2.0	48.88	65.64
176.80	2.5	31.02	96.67
125.00	3.0	3.33	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.41	Well Sorted
Skewness	0.03	Symmetrical
Kurtosis	0.97	Mesokurtic
Mean [µm]	273.45	Medium Sand
Mean [phi]	1.87	
Median [µm]	279.34	Medium Sand
Median [phi]	1.84	
Gravel [%]	0.00	Sand
Sand [%]	100.00	
Mud [%]	0.00	

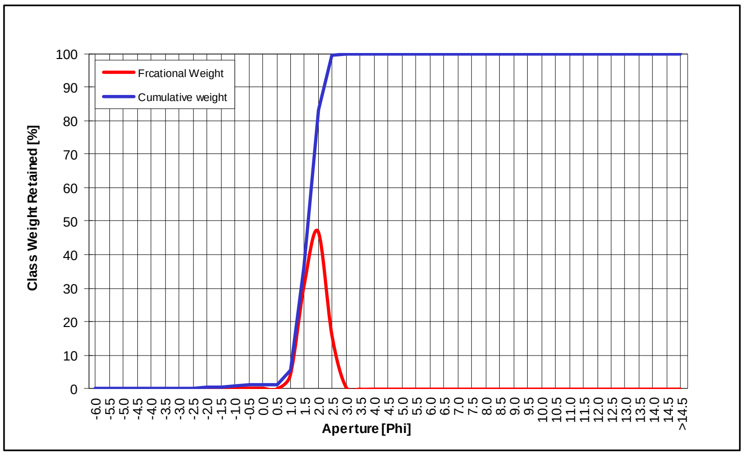


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR05_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.17	0.17
4000	-2.0	0.08	0.25
2800	-1.5	0.20	0.45
2000	-1.0	0.32	0.77
1400	-0.5	0.26	1.04
1000	0.0	0.27	1.31
707.00	0.5	0.01	1.33
500.00	1.0	4.05	5.38
353.60	1.5	30.95	36.33
250.00	2.0	47.03	83.36
176.80	2.5	15.98	99.34
125.00	3.0	0.66	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.43	Well Sorted
Skewness	-0.05	Symmetrical
Kurtosis	0.97	Mesokurtic
Mean [µm]	327.09	Medium Sand
Mean [phi]	1.61	
Median [µm]	319.71	Medium Sand
Median [phi]	1.65	
Gravel [%]	0.77	Slightly Gravelly Sand
Sand [%]	99.23	
Mud [%]	0.00	



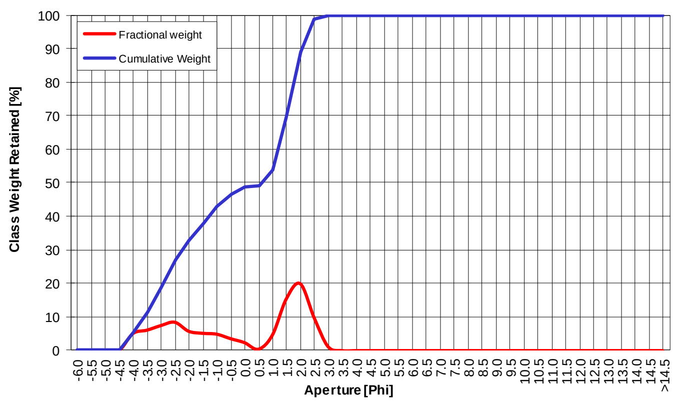
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR05_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	5.08	5.08
11200	-3.5	6.08	11.16
8000	-3.0	7.45	18.60
5600	-2.5	8.44	27.05
4000	-2.0	5.75	32.80
2800	-1.5	5.15	37.95
2000	-1.0	4.90	42.85
1400	-0.5	3.56	46.41
1000	0.0	2.38	48.78
707.00	0.5	0.43	49.21
500.00	1.0	4.62	53.83
353.60	1.5	15.39	69.23
250.00	2.0	19.89	89.11
176.80	2.5	9.72	98.84
125.00	3.0	1.16	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.22	Very Poorly Sorted
Skewness	-0.47	Very Coarse Skewed
Kurtosis	0.61	Very Platykurtic
Mean [µm]	1179.12	Very Coarse Sand
Mean [phi]	-0.24	
Median [µm]	666.52	Coarse Sand
Median [phi]	0.59	
Gravel [%]	42.85	Sandy Gravel
Sand [%]	57.15	
Mud [%]	0.00	



Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR05_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.02	0.02
2000	-1.0	0.00	0.02
1400	-0.5	0.00	0.02
1000	0.0	0.00	0.03
707.00	0.5	0.00	0.03
500.00	1.0	0.56	0.59
353.60	1.5	16.16	16.75
250.00	2.0	48.87	65.62
176.80	2.5	31.06	96.67
125.00	3.0	3.33	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.41	Well Sorted
Skewness	0.03	Symmetrical
Kurtosis	0.97	Mesokurtic
Mean [µm]	273.40	Medium Sand
Mean [phi]	1.87	
Median [µm]	279.29	Medium Sand
Median [phi]	1.84	
Gravel [%]	0.02	Slightly Gravelly Sand
Sand [%]	99.98	
Mud [%]	0.00	

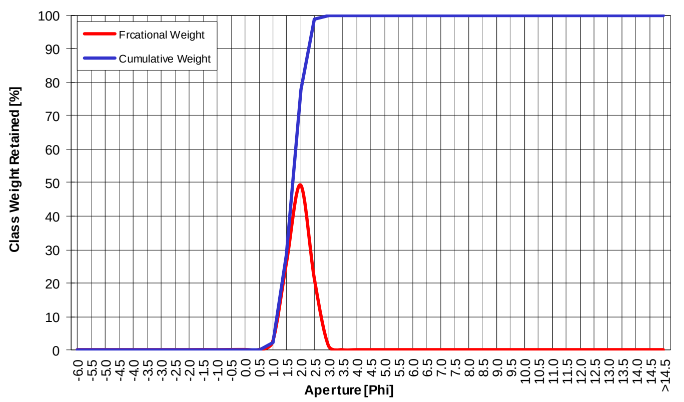
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR06_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.02	0.02
2000	-1.0	0.00	0.02
1400	-0.5	0.03	0.05
1000	0.0	0.05	0.10
707.00	0.5	0.00	0.10
500.00	1.0	2.32	2.42
353.60	1.5	26.10	28.52
250.00	2.0	49.20	77.72
176.80	2.5	21.03	98.75
125.00	3.0	1.25	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.43	Well Sorted
Skewness	-0.01	Symmetrical
Kurtosis	1.03	Mesokurtic
Mean [µm]	305.83	Medium Sand
Mean [phi]	1.71	
Median [µm]	303.93	Medium Sand
Median [phi]	1.72	
Gravel [%]	0.02	Slightly Gravelly Sand
Sand [%]	99.98	
Mud [%]	0.00	



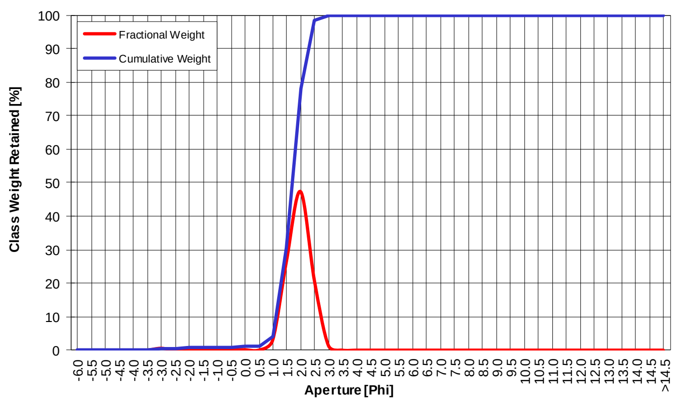
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR06_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.56	0.56
5600	-2.5	0.00	0.56
4000	-2.0	0.11	0.68
2800	-1.5	0.04	0.72
2000	-1.0	0.05	0.77
1400	-0.5	0.09	0.86
1000	0.0	0.13	0.99
707.00	0.5	0.00	0.99
500.00	1.0	2.91	3.90
353.60	1.5	26.68	30.58
250.00	2.0	47.34	77.92
176.80	2.5	20.67	98.59
125.00	3.0	1.41	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.44	Well Sorted
Skewness	-0.01	Symmetrical
Kurtosis	0.99	Mesokurtic
Mean [µm]	309.31	Medium Sand
Mean [phi]	1.69	
Median [µm]	306.73	Medium Sand
Median [phi]	1.70	
Gravel [%]	0.77	Slightly Gravelly Sand
Sand [%]	99.23	
Mud [%]	0.00	



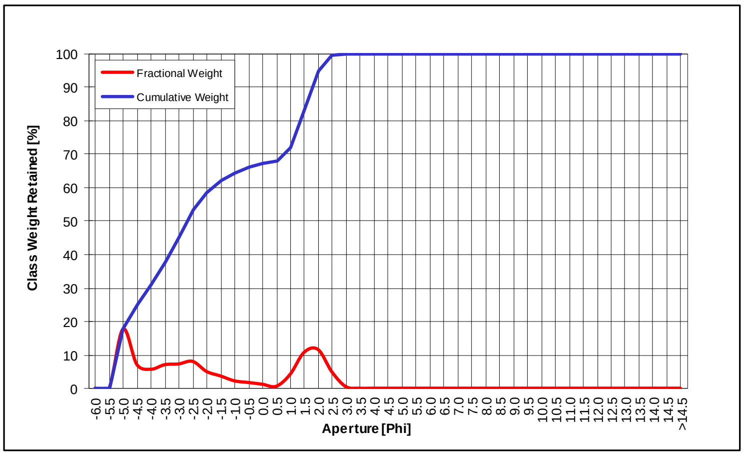
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR07_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	17.89	17.89
22400	-4.5	7.17	25.06
16000	-4.0	5.73	30.78
11200	-3.5	7.12	37.91
8000	-3.0	7.34	45.24
5600	-2.5	8.11	53.36
4000	-2.0	5.06	58.42
2800	-1.5	3.70	62.12
2000	-1.0	2.22	64.34
1400	-0.5	1.73	66.07
1000	0.0	1.20	67.27
707.00	0.5	0.59	67.86
500.00	1.0	4.21	72.07
353.60	1.5	10.85	82.92
250.00	2.0	11.71	94.63
176.80	2.5	4.91	99.54
125.00	3.0	0.46	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.76	Very Poorly Sorted
Skewness	0.29	Fine Skewed
Kurtosis	0.54	Very Platykurtic
Mean [µm]	4173.92	Pebble
Mean [phi]	-2.06	
Median [µm]	6490.95	Pebble
Median [phi]	-2.70	
Gravel [%]	64.34	Sandy Gravel
Sand [%]	35.66	
Mud [%]	0.00	



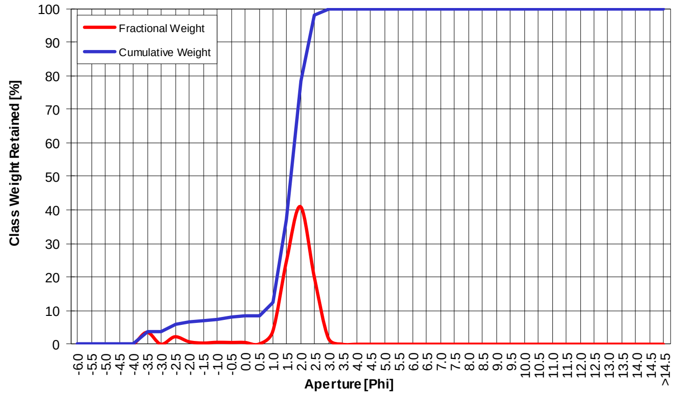
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR07_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	3.58	3.58
8000	-3.0	0.00	3.58
5600	-2.5	2.23	5.81
4000	-2.0	0.76	6.57
2800	-1.5	0.35	6.92
2000	-1.0	0.58	7.50
1400	-0.5	0.52	8.02
1000	0.0	0.53	8.55
707.00	0.5	0.01	8.57
500.00	1.0	3.68	12.24
353.60	1.5	24.94	37.19
250.00	2.0	41.14	78.32
176.80	2.5	19.87	98.19
125.00	3.0	1.81	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.04	Poorly Sorted
Skewness	-0.39	Very Coarse Skewed
Kurtosis	2.96	Very Leptokurtic
Mean [µm]	324.31	Medium Sand
Mean [phi]	1.62	
Median [µm]	317.40	Medium Sand
Median [phi]	1.66	
Gravel [%]	7.50	Gravelly Sand
Sand [%]	92.50	
Mud [%]	0.00	

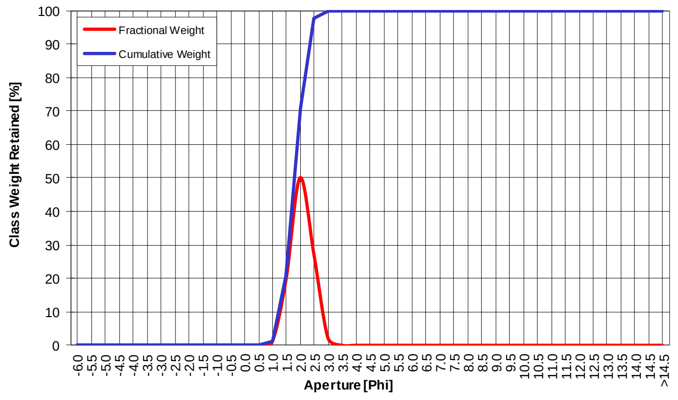


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR07_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.00	0.00
2000	-1.0	0.01	0.01
1400	-0.5	0.01	0.01
1000	0.0	0.02	0.03
707.00	0.5	0.00	0.03
500.00	1.0	1.00	1.03
353.60	1.5	19.74	20.77
250.00	2.0	49.97	70.74
176.80	2.5	27.01	97.75
125.00	3.0	2.25	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.42	Well Sorted
Skewness	0.01	Symmetrical
Kurtosis	1.03	Mesokurtic
Mean [µm]	286.06	Medium Sand
Mean [phi]	1.81	
Median [µm]	288.69	Medium Sand
Median [phi]	1.79	
Gravel [%]	0.01	Slightly Gravelly Sand
Sand [%]	99.99	
Mud [%]	0.00	



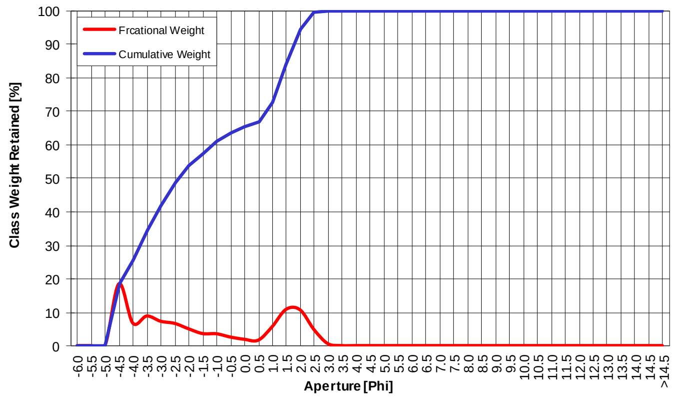
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

I_TR08_HW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	18.70	18.70
16000	-4.0	6.81	25.51
11200	-3.5	8.96	34.47
8000	-3.0	7.36	41.83
5600	-2.5	6.72	48.56
4000	-2.0	5.08	53.64
2800	-1.5	3.65	57.29
2000	-1.0	3.58	60.87
1400	-0.5	2.59	63.46
1000	0.0	1.91	65.37
707.00	0.5	1.65	67.02
500.00	1.0	5.73	72.75
353.60	1.5	10.99	83.74
250.00	2.0	10.83	94.57
176.80	2.5	4.85	99.43
125.00	3.0	0.57	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.56	Very Poorly Sorted
Skewness	0.27	Fine Skewed
Kurtosis	0.55	Very Platykurtic
Mean [µm]	3476.10	Granule
Mean [phi]	-1.80	
Median [µm]	5089.59	Pebble
Median [phi]	-2.35	
Gravel [%]	60.87	Sandy Gravel
Sand [%]	39.13	
Mud [%]	0.00	

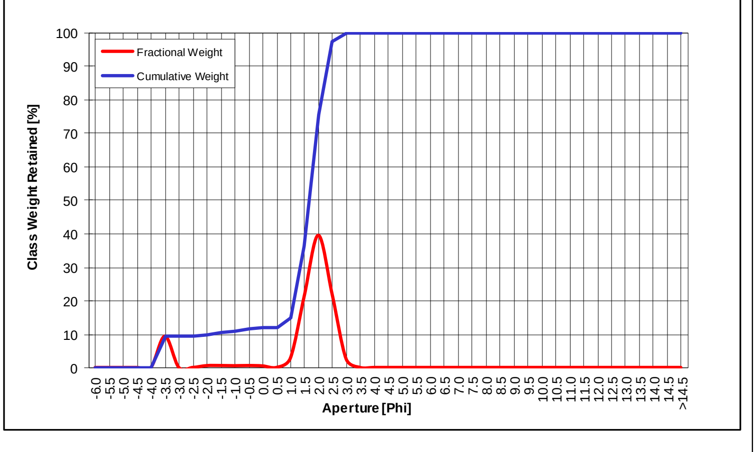


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR08_MW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	9.32	9.32
8000	-3.0	0.00	9.32
5600	-2.5	0.00	9.32
4000	-2.0	0.55	9.87
2800	-1.5	0.58	10.45
2000	-1.0	0.52	10.97
1400	-0.5	0.57	11.54
1000	0.0	0.47	12.01
707.00	0.5	0.01	12.01
500.00	1.0	2.78	14.79
353.60	1.5	21.43	36.22
250.00	2.0	39.48	75.70
176.80	2.5	21.77	97.47
125.00	3.0	2.53	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.23	Poorly Sorted
Skewness	-0.43	Very Coarse Skewed
Kurtosis	3.36	Extremely Leptokurtic
Mean [µm]	322.85	Medium Sand
Mean [phi]	1.63	
Median [µm]	313.30	Medium Sand
Median [phi]	1.67	
Gravel [%]	10.97	Gravelly Sand
Sand [%]	89.03	
Mud [%]	0.00	

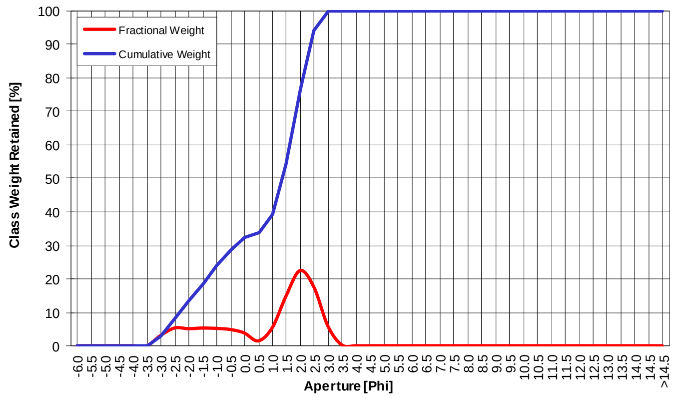


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

I_TR08_LW

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	3.08	3.08
5600	-2.5	5.28	8.36
4000	-2.0	5.07	13.43
2800	-1.5	5.27	18.70
2000	-1.0	5.15	23.86
1400	-0.5	4.83	28.69
1000	0.0	3.80	32.48
707.00	0.5	1.45	33.93
500.00	1.0	5.33	39.26
353.60	1.5	14.85	54.11
250.00	2.0	22.40	76.50
176.80	2.5	17.42	93.92
125.00	3.0	5.85	99.77
88.39	3.5	0.23	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.81	Poorly Sorted
Skewness	-0.56	Very Coarse Skewed
Kurtosis	0.78	Platykurtic
Mean [µm]	655.61	Coarse Sand
Mean [phi]	0.61	
Median [µm]	389.17	Medium Sand
Median [phi]	1.36	
Gravel [%]	23.86	Gravelly Sand
Sand [%]	71.31	
Mud [%]	0.00	



Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

Intertidal Core Samples Photographs

Station I_TR01_HW

Station I_TR01_MW

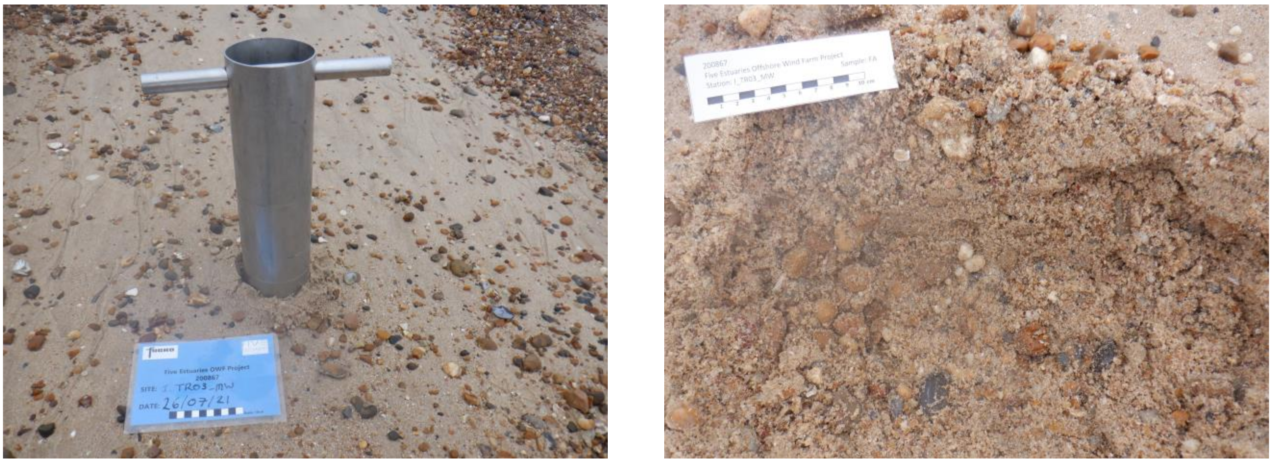

Station I_TR01_LW

Station I_TR02_HW

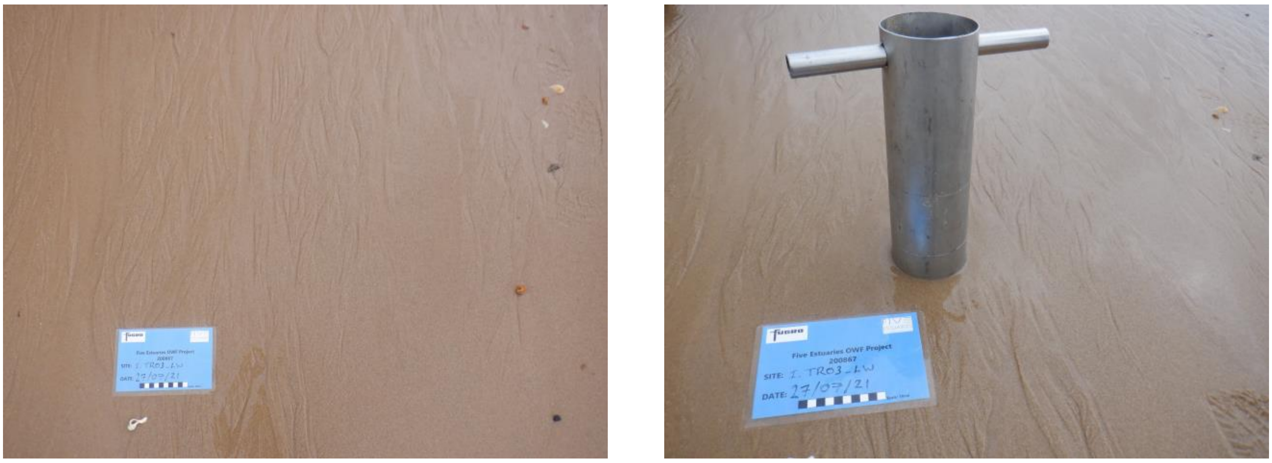
Station I_TR02_MW

Station I_TR02_LW

Station I_TR03_HW



Station I_TR03_MW



Station I_TR03_LW

Station I_TR04_HW

Station I_TR04_MW

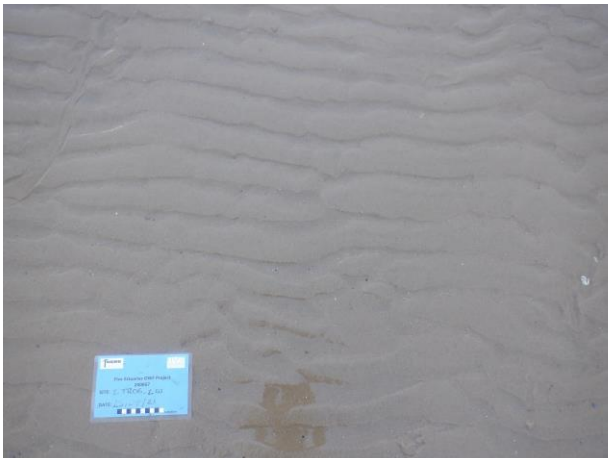
Station I_TR04_LW

Station I_TR05_HW

Station I_TR05_MW

Station I_TR05_LW


Station I_TR06_MW



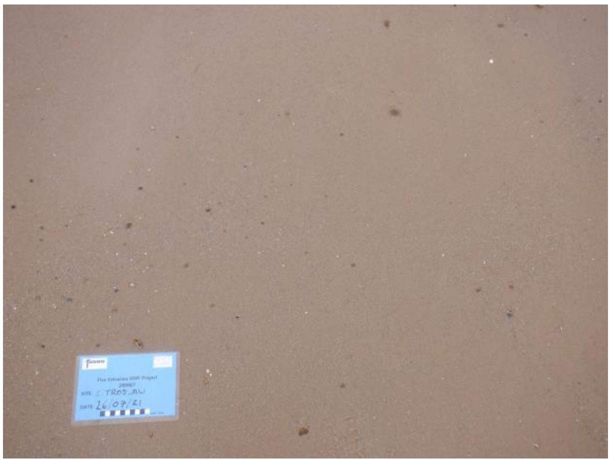

Station I_TR06_LW


Station I_TR07_HW

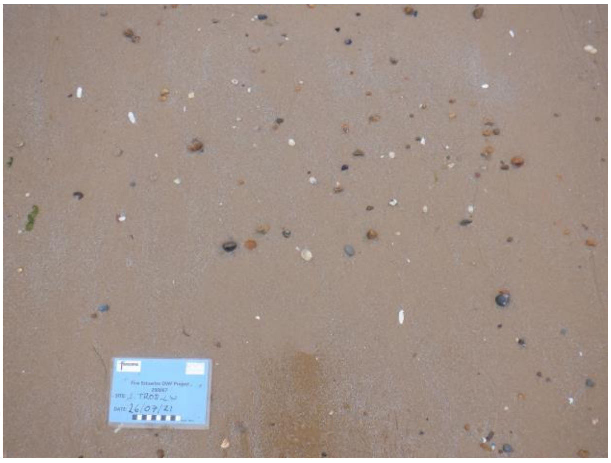
Station I_TR07_MW

Station I_TR07_LW

Station I_TR08_HW




Station I_TR08_MW



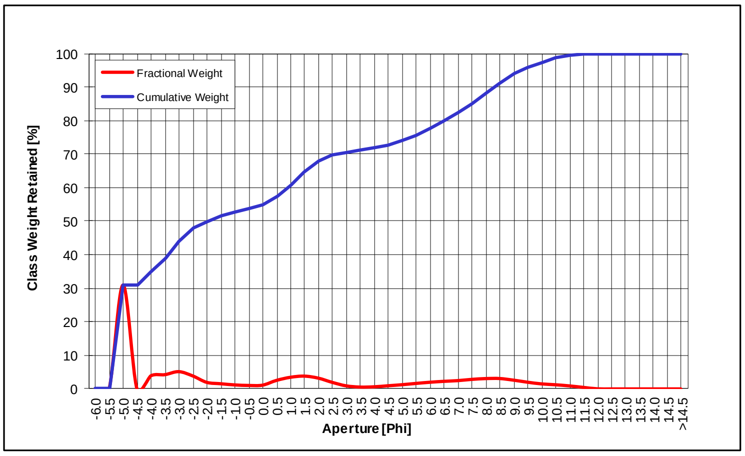

Station I_TR08_LW

Subtidal Grab Samples PSD
Export Cable Route

FE4_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	30.87	30.87
22400	-4.5	0.00	30.87
16000	-4.0	3.90	34.77
11200	-3.5	4.23	39.00
8000	-3.0	5.13	44.13
5600	-2.5	3.86	47.98
4000	-2.0	1.95	49.93
2800	-1.5	1.54	51.47
2000	-1.0	1.19	52.66
1400	-0.5	1.03	53.69
1000	0.0	1.11	54.80
707.00	0.5	2.53	57.33
500.00	1.0	3.45	60.77
353.60	1.5	3.80	64.57
250.00	2.0	3.20	67.78
176.80	2.5	1.94	69.72
125.00	3.0	0.91	70.63
88.39	3.5	0.55	71.18
63.00	4.0	0.63	71.81
44.20	4.5	0.93	72.74
31.30	5.0	1.25	73.98
22.10	5.5	1.63	75.61
15.60	6.0	1.98	77.59
11.00	6.5	2.25	79.84
7.80	7.0	2.46	82.30
5.50	7.5	2.83	85.13
3.90	8.0	3.07	88.20
2.75	8.5	3.09	91.29
1.95	9.0	2.60	93.89
1.38	9.5	2.00	95.89
0.98	10.0	1.49	97.38
0.69	10.5	1.24	98.62
0.49	11.0	0.90	99.51
0.34	11.5	0.45	99.97
0.24	12.0	0.03	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	5.36	Extremely Poorly Sorted
Skewness	0.51	Very Fine Skewed
Kurtosis	0.58	Very Platykurtic
Mean [µm]	976.60	Coarse Sand
Mean [phi]	0.03	
Median [µm]	3937.77	Granule
Median [phi]	-1.98	
Gravel [%]	52.66	Muddy Gravel
Sand [%]	19.15	
Mud [%]	28.19	



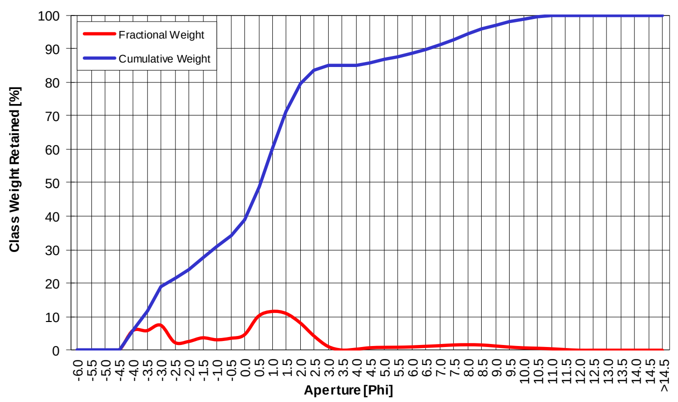
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE4_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	5.83	5.83
11200	-3.5	5.80	11.63
8000	-3.0	7.43	19.06
5600	-2.5	2.33	21.39
4000	-2.0	2.59	23.98
2800	-1.5	3.68	27.66
2000	-1.0	3.11	30.76
1400	-0.5	3.53	34.29
1000	0.0	4.55	38.84
707.00	0.5	10.04	48.88
500.00	1.0	11.51	60.40
353.60	1.5	10.90	71.29
250.00	2.0	8.16	79.46
176.80	2.5	4.23	83.69
125.00	3.0	1.14	84.83
88.39	3.5	0.05	84.88
63.00	4.0	0.29	85.17
44.20	4.5	0.73	85.90
31.30	5.0	0.85	86.75
22.10	5.5	0.88	87.63
15.60	6.0	0.98	88.61
11.00	6.5	1.16	89.77
7.80	7.0	1.34	91.11
5.50	7.5	1.56	92.67
3.90	8.0	1.63	94.30
2.75	8.5	1.56	95.86
1.95	9.0	1.26	97.13
1.38	9.5	0.95	98.07
0.98	10.0	0.71	98.78
0.69	10.5	0.59	99.37
0.49	11.0	0.43	99.80
0.34	11.5	0.20	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.32	Very Poorly Sorted
Skewness	-0.02	Symmetrical
Kurtosis	1.41	Leptokurtic
Mean [µm]	1003.35	Very Coarse Sand
Mean [phi]	0.00	
Median [µm]	683.60	Coarse Sand
Median [phi]	0.55	
Gravel [%]	30.76	Muddy Sandy Gravel
Sand [%]	54.40	
Mud [%]	14.83	



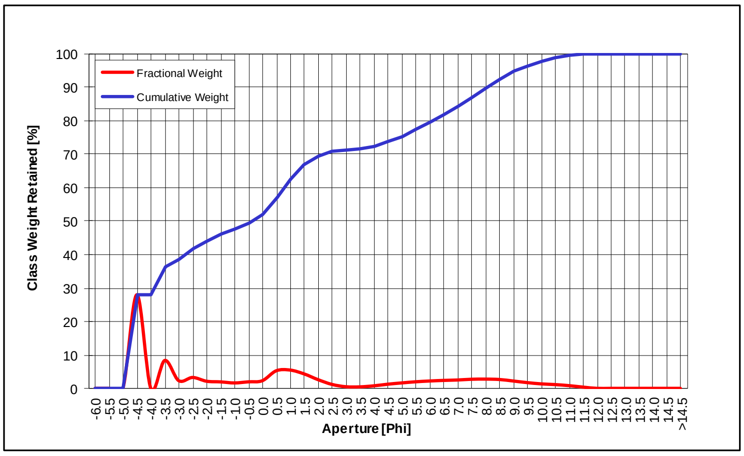
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE4_03

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	28.01	28.01
16000	-4.0	0.00	28.01
11200	-3.5	8.35	36.36
8000	-3.0	2.30	38.67
5600	-2.5	3.26	41.92
4000	-2.0	2.13	44.05
2800	-1.5	1.94	45.99
2000	-1.0	1.62	47.61
1400	-0.5	1.95	49.57
1000	0.0	2.29	51.85
707.00	0.5	5.26	57.11
500.00	1.0	5.47	62.58
353.60	1.5	4.32	66.90
250.00	2.0	2.60	69.50
176.80	2.5	1.18	70.68
125.00	3.0	0.49	71.17
88.39	3.5	0.45	71.62
63.00	4.0	0.75	72.37
44.20	4.5	1.24	73.61
31.30	5.0	1.62	75.24
22.10	5.5	1.96	77.20
15.60	6.0	2.20	79.40
11.00	6.5	2.38	81.77
7.80	7.0	2.50	84.27
5.50	7.5	2.72	86.99
3.90	8.0	2.77	89.76
2.75	8.5	2.65	92.41
1.95	9.0	2.20	94.61
1.38	9.5	1.72	96.34
0.98	10.0	1.34	97.68
0.69	10.5	1.13	98.81
0.49	11.0	0.81	99.62
0.34	11.5	0.38	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	5.03	Extremely Poorly Sorted
Skewness	0.31	Very Fine Skewed
Kurtosis	0.61	Very Platykurtic
Mean [µm]	650.82	Coarse Sand
Mean [phi]	0.62	
Median [µm]	1313.26	Very Coarse Sand
Median [phi]	-0.39	
Gravel [%]	47.61	Muddy Gravel
Sand [%]	24.76	
Mud [%]	27.63	

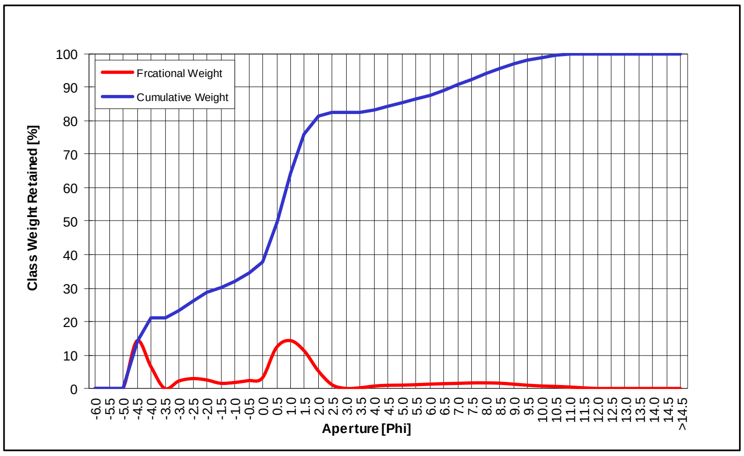


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE4_04

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	14.35	14.35
16000	-4.0	6.66	21.01
11200	-3.5	0.00	21.01
8000	-3.0	2.23	23.24
5600	-2.5	2.98	26.22
4000	-2.0	2.58	28.80
2800	-1.5	1.57	30.37
2000	-1.0	1.80	32.17
1400	-0.5	2.37	34.55
1000	0.0	3.15	37.70
707.00	0.5	12.27	49.97
500.00	1.0	14.47	64.44
353.60	1.5	11.40	75.84
250.00	2.0	5.40	81.24
176.80	2.5	1.14	82.38
125.00	3.0	0.02	82.39
88.39	3.5	0.21	82.61
63.00	4.0	0.71	83.32
44.20	4.5	0.96	84.27
31.30	5.0	1.00	85.28
22.10	5.5	1.14	86.41
15.60	6.0	1.30	87.72
11.00	6.5	1.45	89.16
7.80	7.0	1.54	90.70
5.50	7.5	1.67	92.37
3.90	8.0	1.69	94.06
2.75	8.5	1.60	95.67
1.95	9.0	1.31	96.97
1.38	9.5	1.00	97.97
0.98	10.0	0.76	98.73
0.69	10.5	0.63	99.35
0.49	11.0	0.45	99.80
0.34	11.5	0.20	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.17	Extremely Poorly Sorted
Skewness	0.04	Symmetrical
Kurtosis	1.29	Leptokurtic
Mean [µm]	892.93	Coarse Sand
Mean [phi]	0.16	
Median [µm]	706.51	Coarse Sand
Median [phi]	0.50	
Gravel [%]	32.17	Muddy Sandy Gravel
Sand [%]	51.14	
Mud [%]	16.68	



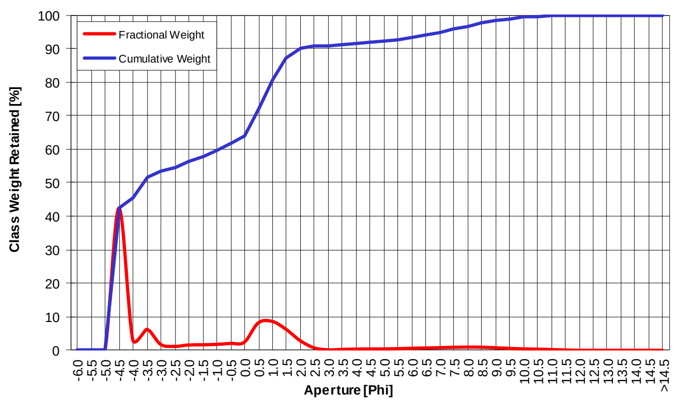
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE4_05

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	42.35	42.35
16000	-4.0	3.08	45.44
11200	-3.5	6.24	51.68
8000	-3.0	1.75	53.42
5600	-2.5	1.16	54.59
4000	-2.0	1.58	56.17
2800	-1.5	1.64	57.81
2000	-1.0	1.76	59.57
1400	-0.5	2.06	61.64
1000	0.0	2.41	64.04
707.00	0.5	8.15	72.20
500.00	1.0	8.61	80.81
353.60	1.5	6.24	87.05
250.00	2.0	2.90	89.95
176.80	2.5	0.75	90.69
125.00	3.0	0.15	90.84
88.39	3.5	0.26	91.10
63.00	4.0	0.37	91.46
44.20	4.5	0.39	91.85
31.30	5.0	0.40	92.25
22.10	5.5	0.49	92.74
15.60	6.0	0.60	93.34
11.00	6.5	0.69	94.04
7.80	7.0	0.78	94.81
5.50	7.5	0.89	95.71
3.90	8.0	0.95	96.65
2.75	8.5	0.92	97.57
1.95	9.0	0.76	98.33
1.38	9.5	0.58	98.91
0.98	10.0	0.42	99.33
0.69	10.5	0.34	99.67
0.49	11.0	0.23	99.90
0.34	11.5	0.10	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.33	Very Poorly Sorted
Skewness	0.70	Very Fine Skewed
Kurtosis	0.92	Mesokurtic
Mean [µm]	5228.75	Pebble
Mean [phi]	-2.39	
Median [µm]	12326.45	Pebble
Median [phi]	-3.62	
Gravel [%]	59.57	Muddy Sandy Gravel
Sand [%]	31.89	
Mud [%]	8.54	



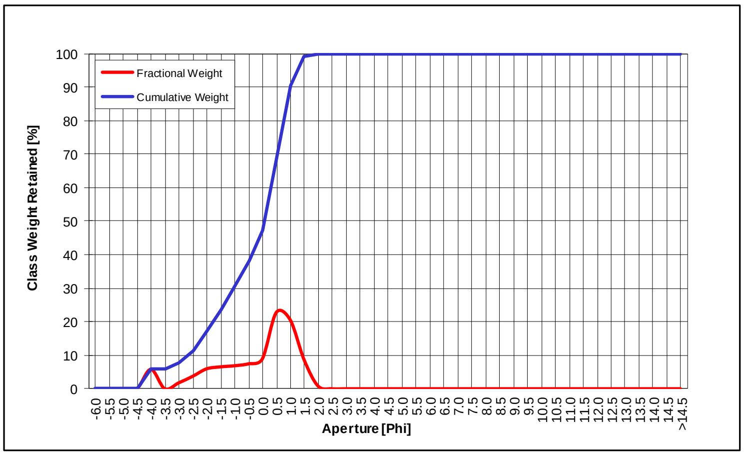
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE4_06

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	5.81	5.81
11200	-3.5	0.00	5.81
8000	-3.0	1.77	7.58
5600	-2.5	3.72	11.30
4000	-2.0	5.96	17.26
2800	-1.5	6.56	23.82
2000	-1.0	6.88	30.70
1400	-0.5	7.45	38.15
1000	0.0	8.92	47.07
707.00	0.5	22.82	69.89
500.00	1.0	20.63	90.52
353.60	1.5	8.66	99.18
250.00	2.0	0.82	100.00
176.80	2.5	0.00	100.00
125.00	3.0	0.00	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.54	Poorly Sorted
Skewness	-0.51	Very Coarse Skewed
Kurtosis	1.08	Mesokurtic
Mean [µm]	1318.41	Very Coarse Sand
Mean [phi]	-0.40	
Median [µm]	956.45	Coarse Sand
Median [phi]	0.06	
Gravel [%]	30.70	Sandy Gravel
Sand [%]	61.85	
Mud [%]	0.00	

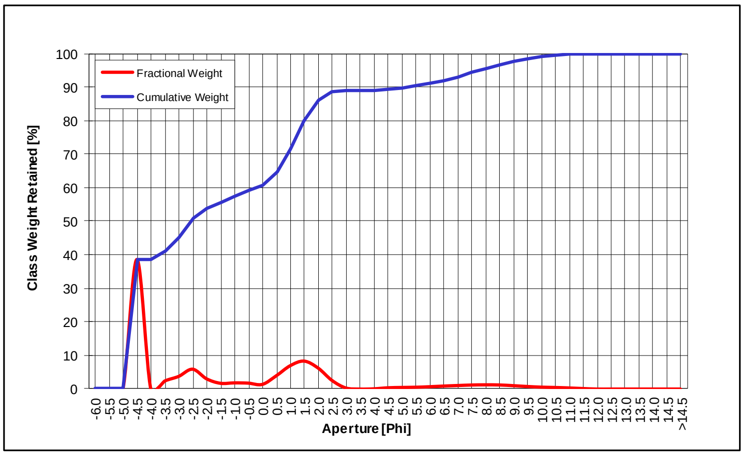


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE4_07

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	38.71	38.71
16000	-4.0	0.00	38.71
11200	-3.5	2.40	41.11
8000	-3.0	3.78	44.89
5600	-2.5	5.92	50.82
4000	-2.0	3.05	53.87
2800	-1.5	1.71	55.58
2000	-1.0	1.84	57.43
1400	-0.5	1.76	59.19
1000	0.0	1.39	60.57
707.00	0.5	3.95	64.53
500.00	1.0	6.97	71.49
353.60	1.5	8.34	79.84
250.00	2.0	6.28	86.12
176.80	2.5	2.57	88.68
125.00	3.0	0.31	88.99
88.39	3.5	0.00	88.99
63.00	4.0	0.06	89.05
44.20	4.5	0.37	89.42
31.30	5.0	0.47	89.89
22.10	5.5	0.54	90.43
15.60	6.0	0.69	91.12
11.00	6.5	0.89	92.01
7.80	7.0	1.04	93.05
5.50	7.5	1.20	94.25
3.90	8.0	1.26	95.51
2.75	8.5	1.22	96.73
1.95	9.0	1.01	97.74
1.38	9.5	0.76	98.50
0.98	10.0	0.57	99.07
0.69	10.5	0.46	99.53
0.49	11.0	0.33	99.86
0.34	11.5	0.14	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.58	Very Poorly Sorted
Skewness	0.48	Very Fine Skewed
Kurtosis	0.89	Platykurtic
Mean [µm]	3562.73	Granule
Mean [phi]	-1.83	
Median [µm]	5882.27	Pebble
Median [phi]	-2.56	
Gravel [%]	57.43	Muddy Sandy Gravel
Sand [%]	31.63	
Mud [%]	10.95	



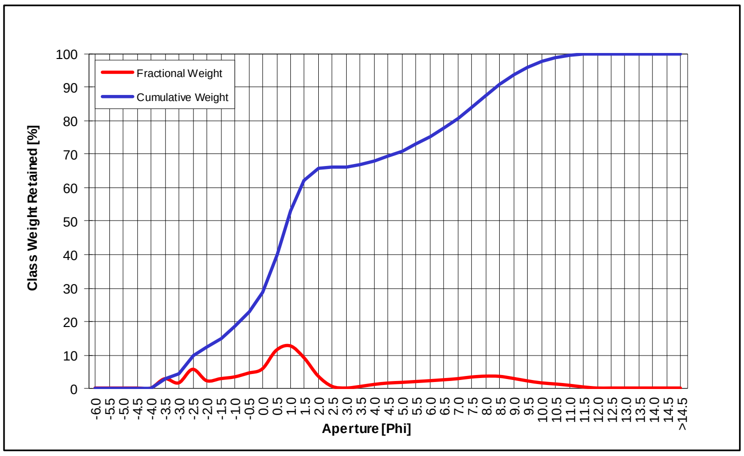
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE4_08

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	2.81	2.81
8000	-3.0	1.56	4.37
5600	-2.5	5.66	10.03
4000	-2.0	2.22	12.25
2800	-1.5	2.83	15.08
2000	-1.0	3.36	18.44
1400	-0.5	4.51	22.96
1000	0.0	5.78	28.74
707.00	0.5	11.41	40.15
500.00	1.0	12.75	52.90
353.60	1.5	9.13	62.03
250.00	2.0	3.67	65.69
176.80	2.5	0.51	66.21
125.00	3.0	0.01	66.21
88.39	3.5	0.47	66.68
63.00	4.0	1.08	67.76
44.20	4.5	1.51	69.27
31.30	5.0	1.71	70.98
22.10	5.5	1.96	72.94
15.60	6.0	2.21	75.15
11.00	6.5	2.50	77.64
7.80	7.0	2.82	80.46
5.50	7.5	3.32	83.79
3.90	8.0	3.59	87.38
2.75	8.5	3.54	90.91
1.95	9.0	2.91	93.83
1.38	9.5	2.18	96.01
0.98	10.0	1.57	97.58
0.69	10.5	1.23	98.81
0.49	11.0	0.84	99.66
0.34	11.5	0.34	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.07	Extremely Poorly Sorted
Skewness	0.43	Very Fine Skewed
Kurtosis	0.80	Platykurtic
Mean [µm]	195.29	Fine Sand
Mean [phi]	2.36	
Median [µm]	541.00	Coarse Sand
Median [phi]	0.89	
Gravel [%]	18.44	Gravelly Muddy Sand
Sand [%]	49.32	
Mud [%]	32.24	



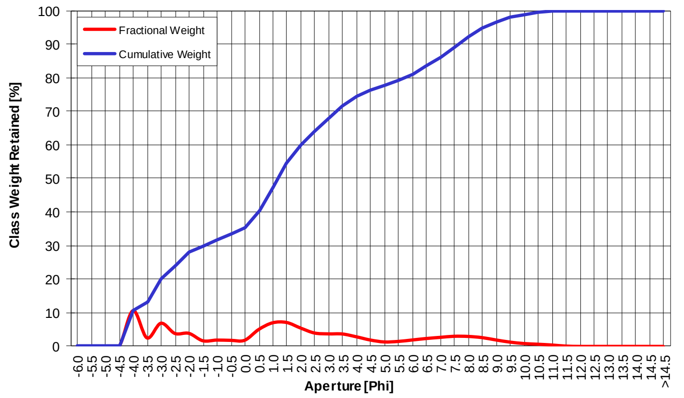
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	10.70	10.70
11200	-3.5	2.54	13.24
8000	-3.0	6.94	20.18
5600	-2.5	3.88	24.06
4000	-2.0	3.92	27.97
2800	-1.5	1.69	29.66
2000	-1.0	1.89	31.55
1400	-0.5	1.82	33.37
1000	0.0	1.84	35.21
707.00	0.5	5.05	40.26
500.00	1.0	7.06	47.32
353.60	1.5	7.17	54.49
250.00	2.0	5.51	60.00
176.80	2.5	4.01	64.02
125.00	3.0	3.75	67.77
88.39	3.5	3.72	71.49
63.00	4.0	2.88	74.37
44.20	4.5	1.91	76.28
31.30	5.0	1.34	77.62
22.10	5.5	1.49	79.11
15.60	6.0	1.92	81.03
11.00	6.5	2.36	83.39
7.80	7.0	2.70	86.09
5.50	7.5	3.03	89.12
3.90	8.0	2.99	92.11
2.75	8.5	2.64	94.75
1.95	9.0	1.93	96.68
1.38	9.5	1.29	97.97
0.98	10.0	0.86	98.83
0.69	10.5	0.65	99.48
0.49	11.0	0.42	99.90
0.34	11.5	0.10	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.42	Extremely Poorly Sorted
Skewness	0.12	Fine Skewed
Kurtosis	0.81	Platykurtic
Mean [µm]	352.50	Medium Sand
Mean [phi]	1.50	
Median [µm]	439.34	Medium Sand
Median [phi]	1.19	
Gravel [%]	31.55	Muddy Sandy Gravel
Sand [%]	42.82	
Mud [%]	25.63	



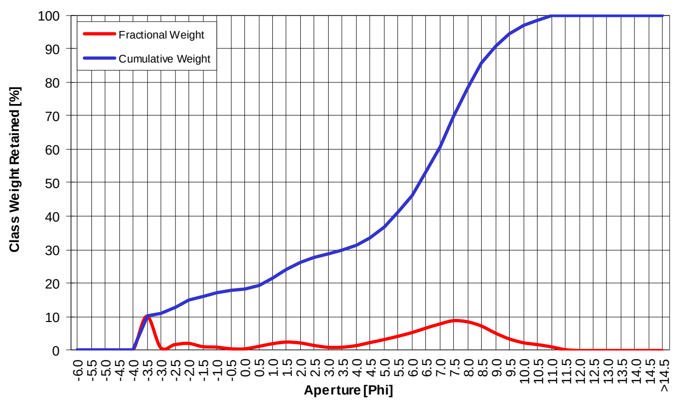
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	10.24	10.24
8000	-3.0	0.84	11.08
5600	-2.5	1.76	12.84
4000	-2.0	2.14	14.98
2800	-1.5	1.17	16.15
2000	-1.0	1.01	17.15
1400	-0.5	0.53	17.68
1000	0.0	0.49	18.17
707.00	0.5	1.20	19.37
500.00	1.0	2.03	21.40
353.60	1.5	2.52	23.92
250.00	2.0	2.28	26.20
176.80	2.5	1.52	27.72
125.00	3.0	0.97	28.69
88.39	3.5	0.98	29.67
63.00	4.0	1.45	31.12
44.20	4.5	2.36	33.48
31.30	5.0	3.24	36.72
22.10	5.5	4.24	40.96
15.60	6.0	5.32	46.28
11.00	6.5	6.66	52.94
7.80	7.0	7.90	60.84
5.50	7.5	8.92	69.76
3.90	8.0	8.60	78.36
2.75	8.5	7.35	85.71
1.95	9.0	5.25	90.96
1.38	9.5	3.50	94.46
0.98	10.0	2.36	96.81
0.69	10.5	1.78	98.60
0.49	11.0	1.13	99.73
0.34	11.5	0.27	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.51	Extremely Poorly Sorted
Skewness	-0.54	Very Coarse Skewed
Kurtosis	0.90	Mesokurtic
Mean [µm]	48.21	Coarse Silt
Mean [phi]	4.37	
Median [µm]	12.84	Fine Silt
Median [phi]	6.28	
Gravel [%]	17.15	Gravelly Mud
Sand [%]	13.97	
Mud [%]	68.88	

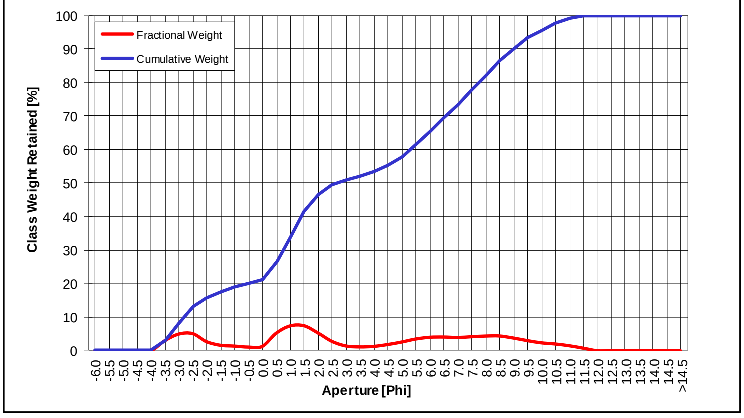


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE5_03

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	2.99	2.99
8000	-3.0	4.95	7.94
5600	-2.5	5.10	13.04
4000	-2.0	2.73	15.77
2800	-1.5	1.66	17.43
2000	-1.0	1.41	18.84
1400	-0.5	1.12	19.96
1000	0.0	1.32	21.28
707.00	0.5	5.22	26.50
500.00	1.0	7.38	33.88
353.60	1.5	7.42	41.30
250.00	2.0	5.29	46.59
176.80	2.5	2.80	49.39
125.00	3.0	1.45	50.84
88.39	3.5	1.17	52.01
63.00	4.0	1.33	53.34
44.20	4.5	1.88	55.22
31.30	5.0	2.62	57.83
22.10	5.5	3.50	61.33
15.60	6.0	4.02	65.35
11.00	6.5	4.09	69.44
7.80	7.0	3.96	73.39
5.50	7.5	4.18	77.57
3.90	8.0	4.38	81.95
2.75	8.5	4.41	86.35
1.95	9.0	3.80	90.15
1.38	9.5	3.04	93.19
0.98	10.0	2.38	95.57
0.69	10.5	2.04	97.61
0.49	11.0	1.52	99.13
0.34	11.5	0.81	99.94
0.24	12.0	0.06	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.54	Extremely Poorly Sorted
Skewness	0.09	Symmetrical
Kurtosis	0.79	Platykurtic
Mean [µm]	124.53	Very Fine Sand
Mean [phi]	3.01	
Median [µm]	152.94	Fine Sand
Median [phi]	2.71	
Gravel [%]	18.84	Gravelly Mud
Sand [%]	34.50	
Mud [%]	46.66	



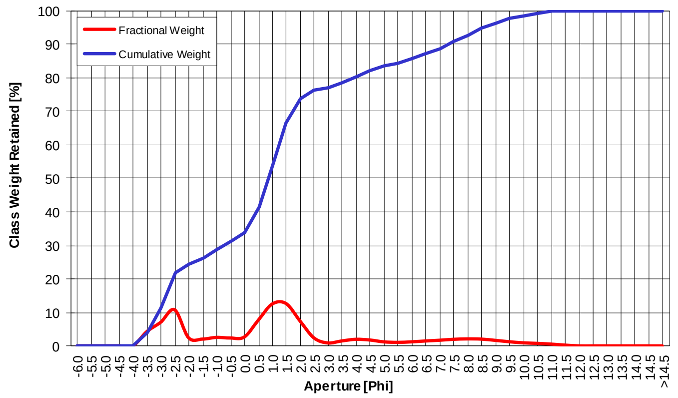
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_04

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	4.22	4.22
8000	-3.0	7.01	11.23
5600	-2.5	10.72	21.95
4000	-2.0	2.40	24.36
2800	-1.5	2.01	26.37
2000	-1.0	2.51	28.88
1400	-0.5	2.33	31.21
1000	0.0	2.63	33.84
707.00	0.5	7.60	41.45
500.00	1.0	12.42	53.87
353.60	1.5	12.55	66.42
250.00	2.0	7.38	73.80
176.80	2.5	2.35	76.15
125.00	3.0	0.87	77.02
88.39	3.5	1.47	78.48
63.00	4.0	1.95	80.43
44.20	4.5	1.74	82.17
31.30	5.0	1.19	83.36
22.10	5.5	1.04	84.40
15.60	6.0	1.20	85.60
11.00	6.5	1.45	87.05
7.80	7.0	1.67	88.71
5.50	7.5	1.95	90.66
3.90	8.0	2.07	92.73
2.75	8.5	2.01	94.74
1.95	9.0	1.64	96.37
1.38	9.5	1.23	97.60
0.98	10.0	0.91	98.51
0.69	10.5	0.74	99.25
0.49	11.0	0.53	99.77
0.34	11.5	0.23	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.84	Very Poorly Sorted
Skewness	0.20	Fine Skewed
Kurtosis	1.20	Leptokurtic
Mean [µm]	458.07	Medium Sand
Mean [phi]	1.13	
Median [µm]	556.95	Coarse Sand
Median [phi]	0.84	
Gravel [%]	28.88	Gravelly Muddy Sand
Sand [%]	51.55	
Mud [%]	19.57	

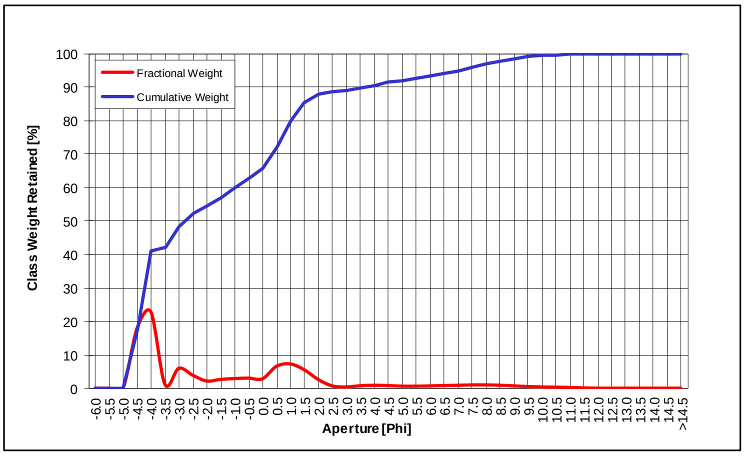


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE5_05

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	18.03	18.03
16000	-4.0	23.05	41.09
11200	-3.5	1.21	42.30
8000	-3.0	6.01	48.31
5600	-2.5	3.92	52.23
4000	-2.0	2.16	54.39
2800	-1.5	2.66	57.05
2000	-1.0	2.90	59.95
1400	-0.5	3.05	63.00
1000	0.0	2.84	65.84
707.00	0.5	6.59	72.43
500.00	1.0	7.32	79.75
353.60	1.5	5.55	85.29
250.00	2.0	2.62	87.91
176.80	2.5	0.69	88.60
125.00	3.0	0.37	88.97
88.39	3.5	0.73	89.70
63.00	4.0	0.88	90.58
44.20	4.5	0.79	91.37
31.30	5.0	0.62	91.99
22.10	5.5	0.60	92.59
15.60	6.0	0.69	93.28
11.00	6.5	0.79	94.07
7.80	7.0	0.88	94.95
5.50	7.5	0.98	95.93
3.90	8.0	0.98	96.91
2.75	8.5	0.90	97.81
1.95	9.0	0.69	98.51
1.38	9.5	0.50	99.01
0.98	10.0	0.37	99.38
0.69	10.5	0.31	99.69
0.49	11.0	0.22	99.91
0.34	11.5	0.09	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.28	Very Poorly Sorted
Skewness	0.53	Very Fine Skewed
Kurtosis	0.97	Mesokurtic
Mean [µm]	3941.07	Granule
Mean [phi]	-1.98	
Median [µm]	6859.38	Pebble
Median [phi]	-2.78	
Gravel [%]	59.95	Muddy Sandy Gravel
Sand [%]	30.63	
Mud [%]	9.42	



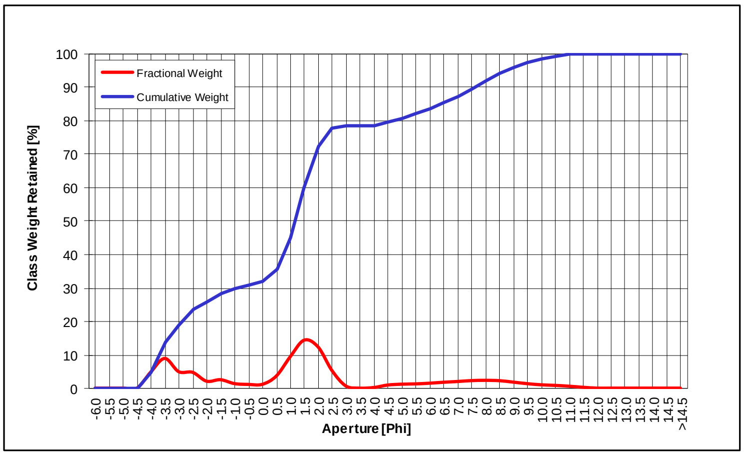
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_06

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	4.91	4.91
11200	-3.5	9.04	13.95
8000	-3.0	5.00	18.95
5600	-2.5	4.80	23.75
4000	-2.0	2.11	25.85
2800	-1.5	2.56	28.41
2000	-1.0	1.37	29.78
1400	-0.5	1.12	30.90
1000	0.0	1.15	32.06
707.00	0.5	3.66	35.71
500.00	1.0	9.53	45.25
353.60	1.5	14.60	59.85
250.00	2.0	12.54	72.39
176.80	2.5	5.34	77.73
125.00	3.0	0.64	78.36
88.39	3.5	0.00	78.36
63.00	4.0	0.18	78.54
44.20	4.5	0.94	79.48
31.30	5.0	1.19	80.67
22.10	5.5	1.29	81.96
15.60	6.0	1.49	83.45
11.00	6.5	1.78	85.23
7.80	7.0	2.01	87.24
5.50	7.5	2.28	89.52
3.90	8.0	2.37	91.89
2.75	8.5	2.26	94.15
1.95	9.0	1.83	95.98
1.38	9.5	1.36	97.33
0.98	10.0	1.01	98.34
0.69	10.5	0.83	99.17
0.49	11.0	0.58	99.75
0.34	11.5	0.25	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.29	Extremely Poorly Sorted
Skewness	0.12	Fine Skewed
Kurtosis	1.18	Leptokurtic
Mean [µm]	393.65	Medium Sand
Mean [phi]	1.35	
Median [µm]	446.66	Medium Sand
Median [phi]	1.16	
Gravel [%]	29.78	Gravelly Muddy Sand
Sand [%]	48.76	
Mud [%]	21.46	



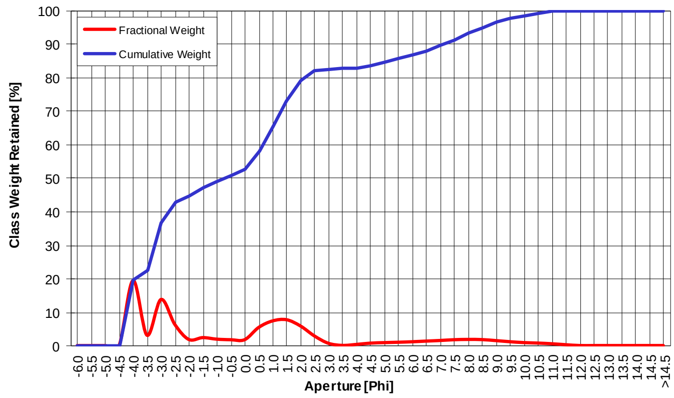
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_07

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	19.59	19.59
11200	-3.5	3.10	22.69
8000	-3.0	13.88	36.57
5600	-2.5	6.33	42.90
4000	-2.0	1.82	44.72
2800	-1.5	2.39	47.10
2000	-1.0	1.92	49.02
1400	-0.5	1.75	50.77
1000	0.0	1.77	52.54
707.00	0.5	5.44	57.98
500.00	1.0	7.42	65.40
353.60	1.5	7.78	73.18
250.00	2.0	5.89	79.07
176.80	2.5	2.88	81.95
125.00	3.0	0.68	82.63
88.39	3.5	0.04	82.67
63.00	4.0	0.33	83.00
44.20	4.5	0.72	83.72
31.30	5.0	0.87	84.59
22.10	5.5	0.99	85.58
15.60	6.0	1.14	86.72
11.00	6.5	1.33	88.05
7.80	7.0	1.52	89.57
5.50	7.5	1.75	91.33
3.90	8.0	1.84	93.17
2.75	8.5	1.79	94.96
1.95	9.0	1.49	96.44
1.38	9.5	1.15	97.59
0.98	10.0	0.88	98.48
0.69	10.5	0.74	99.22
0.49	11.0	0.54	99.75
0.34	11.5	0.25	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.14	Extremely Poorly Sorted
Skewness	0.33	Very Fine Skewed
Kurtosis	1.04	Mesokurtic
Mean [µm]	1032.77	Very Coarse Sand
Mean [phi]	-0.05	
Median [µm]	1638.41	Very Coarse Sand
Median [phi]	-0.71	
Gravel [%]	49.02	Muddy Sandy Gravel
Sand [%]	33.98	
Mud [%]	17.00	



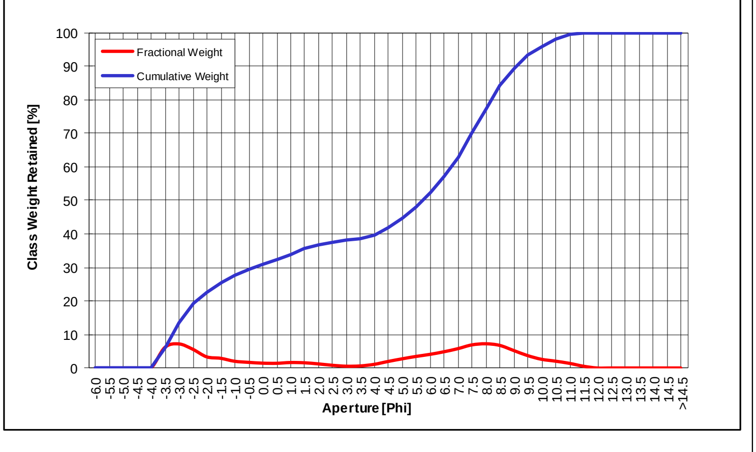
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_08

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	6.24	6.24
8000	-3.0	7.31	13.55
5600	-2.5	5.69	19.24
4000	-2.0	3.38	22.62
2800	-1.5	2.94	25.57
2000	-1.0	2.04	27.61
1400	-0.5	1.72	29.33
1000	0.0	1.47	30.79
707.00	0.5	1.42	32.22
500.00	1.0	1.66	33.88
353.60	1.5	1.58	35.46
250.00	2.0	1.25	36.70
176.80	2.5	0.82	37.53
125.00	3.0	0.54	38.07
88.39	3.5	0.62	38.69
63.00	4.0	1.10	39.79
44.20	4.5	1.98	41.77
31.30	5.0	2.77	44.54
22.10	5.5	3.50	48.05
15.60	6.0	4.13	52.18
11.00	6.5	4.92	57.10
7.80	7.0	5.85	62.95
5.50	7.5	7.00	69.95
3.90	8.0	7.35	77.30
2.75	8.5	6.88	84.18
1.95	9.0	5.33	89.51
1.38	9.5	3.78	93.30
0.98	10.0	2.65	95.95
0.69	10.5	2.08	98.03
0.49	11.0	1.42	99.45
0.34	11.5	0.55	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.85	Extremely Poorly Sorted
Skewness	-0.45	Very Coarse Skewed
Kurtosis	0.58	Very Platykurtic
Mean [µm]	70.94	Very Fine Sand
Mean [phi]	3.82	
Median [µm]	18.74	Medium Silt
Median [phi]	5.74	
Gravel [%]	27.61	Gravelly Mud
Sand [%]	12.18	
Mud [%]	60.21	

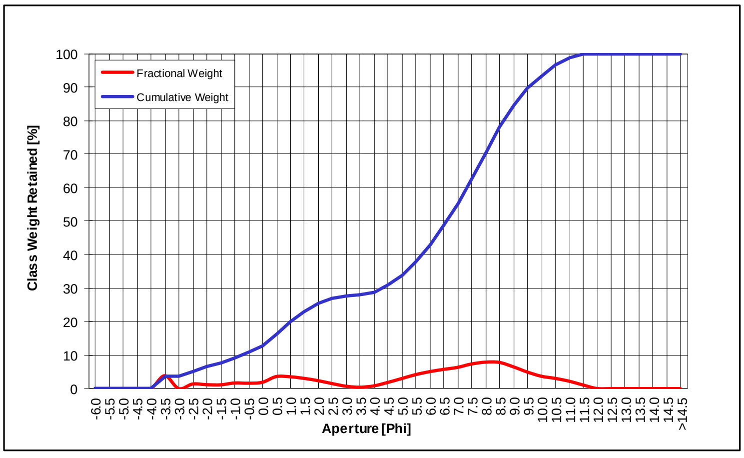


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE5_09

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	3.86	3.86
8000	-3.0	0.00	3.86
5600	-2.5	1.39	5.24
4000	-2.0	1.18	6.43
2800	-1.5	1.14	7.57
2000	-1.0	1.69	9.26
1400	-0.5	1.62	10.88
1000	0.0	1.90	12.78
707.00	0.5	3.61	16.39
500.00	1.0	3.55	19.94
353.60	1.5	3.07	23.01
250.00	2.0	2.38	25.39
176.80	2.5	1.52	26.91
125.00	3.0	0.72	27.63
88.39	3.5	0.43	28.06
63.00	4.0	0.82	28.89
44.20	4.5	1.86	30.74
31.30	5.0	3.02	33.76
22.10	5.5	4.19	37.95
15.60	6.0	5.08	43.02
11.00	6.5	5.76	48.78
7.80	7.0	6.36	55.13
5.50	7.5	7.36	62.50
3.90	8.0	7.92	70.42
2.75	8.5	7.85	78.27
1.95	9.0	6.54	84.81
1.38	9.5	4.99	89.80
0.98	10.0	3.72	93.52
0.69	10.5	3.08	96.60
0.49	11.0	2.25	98.85
0.34	11.5	1.10	99.95
0.24	12.0	0.05	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.07	Extremely Poorly Sorted
Skewness	-0.44	Very Coarse Skewed
Kurtosis	0.82	Platykurtic
Mean [µm]	24.87	Medium Silt
Mean [phi]	5.33	
Median [µm]	10.30	Fine Silt
Median [phi]	6.60	
Gravel [%]	9.26	Gravelly Mud
Sand [%]	19.63	
Mud [%]	71.11	



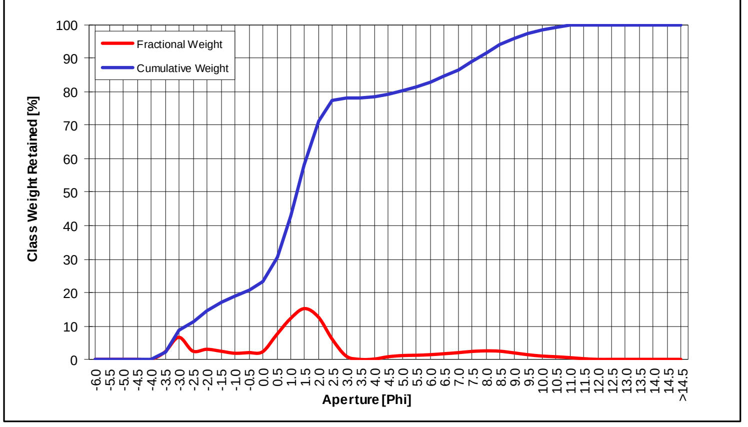
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE5_10

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	2.23	2.23
8000	-3.0	6.69	8.92
5600	-2.5	2.51	11.42
4000	-2.0	3.05	14.48
2800	-1.5	2.48	16.96
2000	-1.0	1.86	18.81
1400	-0.5	2.04	20.85
1000	0.0	2.28	23.13
707.00	0.5	7.39	30.52
500.00	1.0	12.33	42.85
353.60	1.5	15.39	58.24
250.00	2.0	12.87	71.11
176.80	2.5	6.12	77.22
125.00	3.0	1.00	78.22
88.39	3.5	0.00	78.22
63.00	4.0	0.08	78.31
44.20	4.5	0.78	79.09
31.30	5.0	1.14	80.23
22.10	5.5	1.24	81.48
15.60	6.0	1.41	82.88
11.00	6.5	1.70	84.58
7.80	7.0	2.01	86.60
5.50	7.5	2.40	89.00
3.90	8.0	2.57	91.57
2.75	8.5	2.48	94.05
1.95	9.0	1.98	96.03
1.38	9.5	1.42	97.45
0.98	10.0	1.01	98.46
0.69	10.5	0.79	99.25
0.49	11.0	0.54	99.79
0.34	11.5	0.21	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.83	Very Poorly Sorted
Skewness	0.26	Fine Skewed
Kurtosis	2.25	Very Leptokurtic
Mean [µm]	256.91	Medium Sand
Mean [phi]	1.96	
Median [µm]	425.65	Medium Sand
Median [phi]	1.23	
Gravel [%]	18.81	Gravelly Muddy Sand
Sand [%]	59.49	
Mud [%]	21.69	



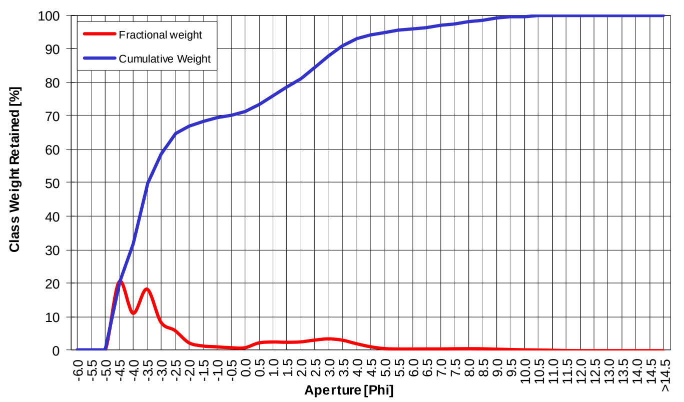
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE6_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	20.49	20.49
16000	-4.0	11.14	31.63
11200	-3.5	18.34	49.97
8000	-3.0	8.50	58.47
5600	-2.5	6.02	64.49
4000	-2.0	2.38	66.87
2800	-1.5	1.40	68.27
2000	-1.0	1.14	69.40
1400	-0.5	0.89	70.29
1000	0.0	0.86	71.15
707.00	0.5	2.30	73.45
500.00	1.0	2.59	76.04
353.60	1.5	2.50	78.54
250.00	2.0	2.62	81.16
176.80	2.5	3.14	84.30
125.00	3.0	3.52	87.82
88.39	3.5	3.13	90.95
63.00	4.0	2.09	93.04
44.20	4.5	1.18	94.22
31.30	5.0	0.62	94.85
22.10	5.5	0.50	95.34
15.60	6.0	0.51	95.85
11.00	6.5	0.52	96.37
7.80	7.0	0.52	96.88
5.50	7.5	0.56	97.45
3.90	8.0	0.58	98.03
2.75	8.5	0.56	98.58
1.95	9.0	0.45	99.04
1.38	9.5	0.34	99.38
0.98	10.0	0.25	99.63
0.69	10.5	0.20	99.83
0.49	11.0	0.14	99.97
0.34	11.5	0.03	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.28	Very Poorly Sorted
Skewness	0.71	Very Fine Skewed
Kurtosis	0.81	Platykurtic
Mean [µm]	3668.33	Granule
Mean [phi]	-1.88	
Median [µm]	11187.36	Pebble
Median [phi]	-3.48	
Gravel [%]	69.40	Muddy Sandy Gravel
Sand [%]	23.64	
Mud [%]	6.96	



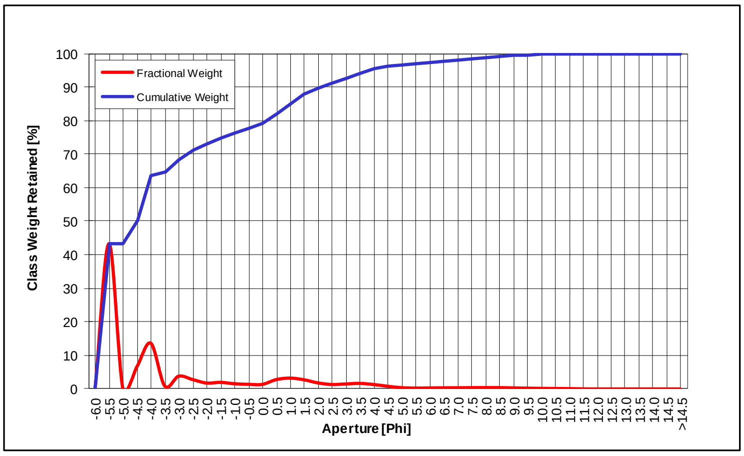
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE6_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	43.36	43.36
31500	-5.0	0.00	43.36
22400	-4.5	6.63	49.99
16000	-4.0	13.65	63.64
11200	-3.5	0.87	64.51
8000	-3.0	3.82	68.33
5600	-2.5	2.80	71.13
4000	-2.0	1.76	72.89
2800	-1.5	1.97	74.86
2000	-1.0	1.55	76.41
1400	-0.5	1.38	77.79
1000	0.0	1.36	79.15
707.00	0.5	2.78	81.93
500.00	1.0	3.23	85.16
353.60	1.5	2.73	87.89
250.00	2.0	1.80	89.69
176.80	2.5	1.33	91.01
125.00	3.0	1.49	92.51
88.39	3.5	1.65	94.16
63.00	4.0	1.32	95.48
44.20	4.5	0.80	96.27
31.30	5.0	0.37	96.65
22.10	5.5	0.26	96.91
15.60	6.0	0.30	97.21
11.00	6.5	0.33	97.54
7.80	7.0	0.35	97.89
5.50	7.5	0.38	98.27
3.90	8.0	0.39	98.66
2.75	8.5	0.38	99.04
1.95	9.0	0.31	99.36
1.38	9.5	0.23	99.59
0.98	10.0	0.17	99.75
0.69	10.5	0.13	99.89
0.49	11.0	0.09	99.98
0.34	11.5	0.02	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.13	Very Poorly Sorted
Skewness	0.65	Very Fine Skewed
Kurtosis	0.94	Mesokurtic
Mean [µm]	8904.16	Pebble
Mean [phi]	-3.15	
Median [µm]	22397.04	Pebble
Median [phi]	-4.49	
Gravel [%]	76.41	Muddy Sandy Gravel
Sand [%]	19.07	
Mud [%]	4.52	

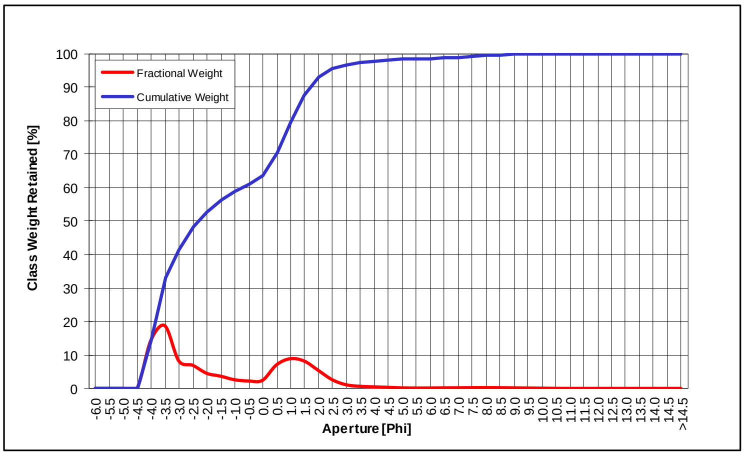


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE6_04

Aperture [μm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	14.39	14.39
11200	-3.5	18.73	33.12
8000	-3.0	8.20	41.33
5600	-2.5	6.90	48.23
4000	-2.0	4.51	52.74
2800	-1.5	3.65	56.39
2000	-1.0	2.58	58.98
1400	-0.5	2.22	61.20
1000	0.0	2.42	63.62
707.00	0.5	7.03	70.65
500.00	1.0	8.89	79.53
353.60	1.5	8.16	87.70
250.00	2.0	5.39	93.08
176.80	2.5	2.60	95.68
125.00	3.0	1.09	96.77
88.39	3.5	0.62	97.39
63.00	4.0	0.47	97.86
44.20	4.5	0.32	98.18
31.30	5.0	0.17	98.35
22.10	5.5	0.12	98.47
15.60	6.0	0.14	98.60
11.00	6.5	0.17	98.77
7.80	7.0	0.19	98.96
5.50	7.5	0.22	99.18
3.90	8.0	0.23	99.41
2.75	8.5	0.21	99.62
1.95	9.0	0.17	99.79
1.38	9.5	0.12	99.91
0.98	10.0	0.08	99.98
0.69	10.5	0.02	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.32	Very Poorly Sorted
Skewness	0.38	Very Fine Skewed
Kurtosis	0.62	Very Platykurtic
Mean [μm]	3158.07	Granule
Mean [phi]	-1.66	
Median [μm]	4906.83	Pebble
Median [phi]	-2.29	
Gravel [%]	58.98	Sandy Gravel
Sand [%]	38.88	
Mud [%]	2.14	



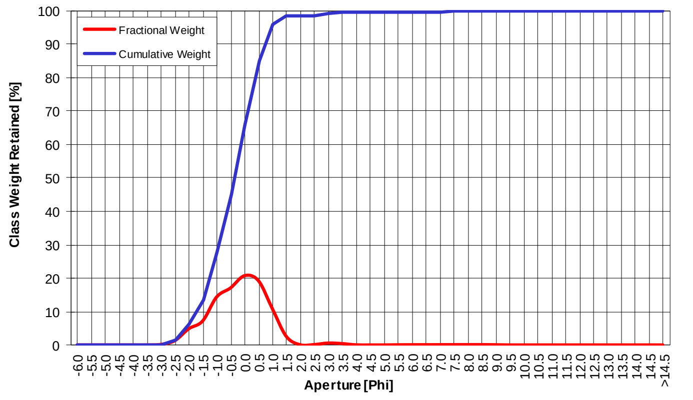
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE6_06

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.16	0.16
5600	-2.5	1.28	1.44
4000	-2.0	4.84	6.28
2800	-1.5	7.18	13.47
2000	-1.0	14.36	27.82
1400	-0.5	17.07	44.90
1000	0.0	20.73	65.63
707.00	0.5	19.23	84.86
500.00	1.0	10.84	95.71
353.60	1.5	2.55	98.26
250.00	2.0	0.05	98.31
176.80	2.5	0.12	98.43
125.00	3.0	0.57	99.00
88.39	3.5	0.40	99.40
63.00	4.0	0.02	99.42
44.20	4.5	0.00	99.42
31.30	5.0	0.00	99.42
22.10	5.5	0.04	99.46
15.60	6.0	0.06	99.52
11.00	6.5	0.07	99.59
7.80	7.0	0.08	99.67
5.50	7.5	0.09	99.76
3.90	8.0	0.10	99.85
2.75	8.5	0.10	99.95
1.95	9.0	0.05	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.94	Moderately Sorted
Skewness	-0.12	Coarse Skewed
Kurtosis	0.95	Mesokurtic
Mean [µm]	1346.57	Very Coarse Sand
Mean [phi]	-0.43	
Median [µm]	1288.69	Very Coarse Sand
Median [phi]	-0.37	
Gravel [%]	27.82	Gravelly Sand
Sand [%]	71.60	
Mud [%]	0.58	



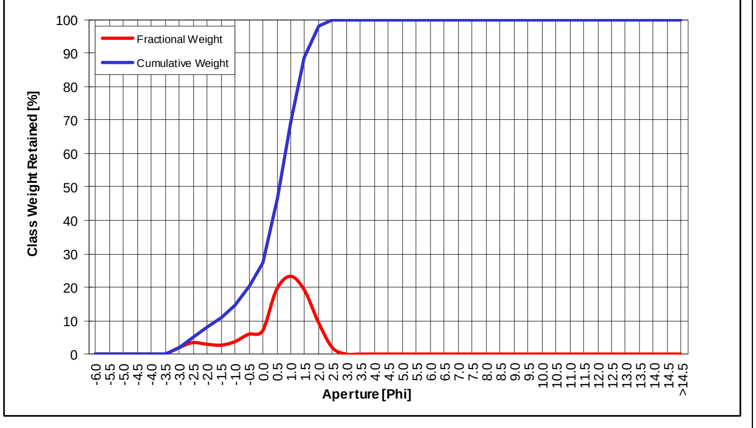
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE6_07

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	1.90	1.90
5600	-2.5	3.39	5.29
4000	-2.0	2.94	8.23
2800	-1.5	2.64	10.86
2000	-1.0	3.66	14.52
1400	-0.5	5.89	20.41
1000	0.0	6.86	27.28
707.00	0.5	19.07	46.35
500.00	1.0	23.12	69.47
353.60	1.5	19.04	88.50
250.00	2.0	9.54	98.05
176.80	2.5	1.95	100.00
125.00	3.0	0.00	100.00
88.39	3.5	0.00	100.00
63.00	4.0	0.00	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	1.23	Poorly Sorted
Skewness	-0.36	Very Coarse Skewed
Kurtosis	1.37	Leptokurtic
Mean [µm]	777.39	Coarse Sand
Mean [phi]	0.36	
Median [µm]	669.34	Coarse Sand
Median [phi]	0.58	
Gravel [%]	14.52	Gravelly Sand
Sand [%]	85.48	
Mud [%]	0.00	



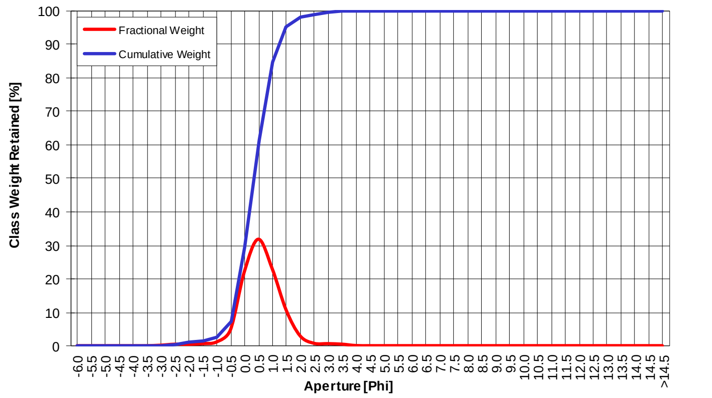
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE6_08

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.14	0.14
5600	-2.5	0.44	0.58
4000	-2.0	0.41	0.99
2800	-1.5	0.60	1.60
2000	-1.0	1.11	2.70
1400	-0.5	4.70	7.40
1000	0.0	22.13	29.53
707.00	0.5	31.91	61.44
500.00	1.0	23.08	84.52
353.60	1.5	10.70	95.22
250.00	2.0	2.97	98.18
176.80	2.5	0.71	98.90
125.00	3.0	0.61	99.50
88.39	3.5	0.46	99.96
63.00	4.0	0.04	100.00
44.20	4.5	0.00	100.00
31.30	5.0	0.00	100.00
22.10	5.5	0.00	100.00
15.60	6.0	0.00	100.00
11.00	6.5	0.00	100.00
7.80	7.0	0.00	100.00
5.50	7.5	0.00	100.00
3.90	8.0	0.00	100.00
2.75	8.5	0.00	100.00
1.95	9.0	0.00	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	0.66	Moderately Well Sorted
Skewness	0.04	Symmetrical
Kurtosis	1.03	Mesokurtic
Mean [µm]	791.34	Coarse Sand
Mean [phi]	0.34	
Median [µm]	800.55	Coarse Sand
Median [phi]	0.32	
Gravel [%]	2.70	Slightly Gravelly Sand
Sand [%]	97.30	
Mud [%]	0.00	

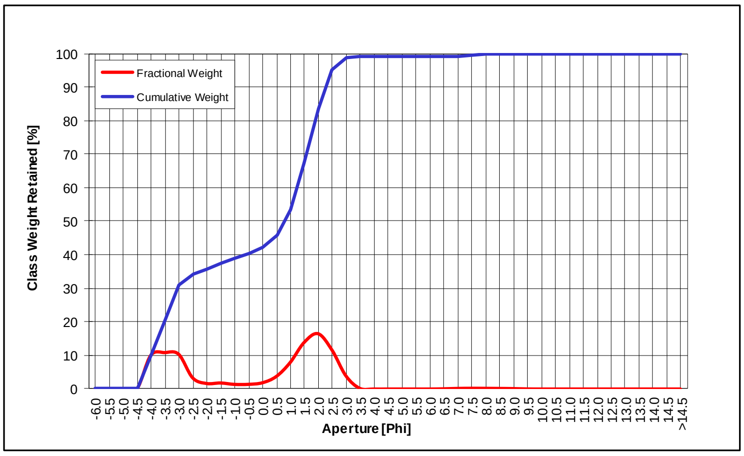


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE6_09

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	9.95	9.95
11200	-3.5	10.71	20.66
8000	-3.0	10.21	30.88
5600	-2.5	3.29	34.16
4000	-2.0	1.62	35.79
2800	-1.5	1.77	37.56
2000	-1.0	1.36	38.92
1400	-0.5	1.37	40.29
1000	0.0	1.83	42.12
707.00	0.5	3.68	45.80
500.00	1.0	7.80	53.60
353.60	1.5	13.69	67.29
250.00	2.0	16.27	83.56
176.80	2.5	11.45	95.01
125.00	3.0	3.87	98.88
88.39	3.5	0.18	99.07
63.00	4.0	0.00	99.07
44.20	4.5	0.00	99.07
31.30	5.0	0.00	99.07
22.10	5.5	0.00	99.07
15.60	6.0	0.00	99.07
11.00	6.5	0.05	99.12
7.80	7.0	0.17	99.29
5.50	7.5	0.21	99.50
3.90	8.0	0.20	99.70
2.75	8.5	0.16	99.86
1.95	9.0	0.12	99.98
1.38	9.5	0.02	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.45	Very Poorly Sorted
Skewness	-0.53	Very Coarse Skewed
Kurtosis	0.55	Very Platykurtic
Mean [µm]	1237.12	Very Coarse Sand
Mean [phi]	-0.31	
Median [µm]	586.70	Coarse Sand
Median [phi]	0.77	
Gravel [%]	38.92	Sandy Gravel
Sand [%]	60.15	
Mud [%]	0.93	

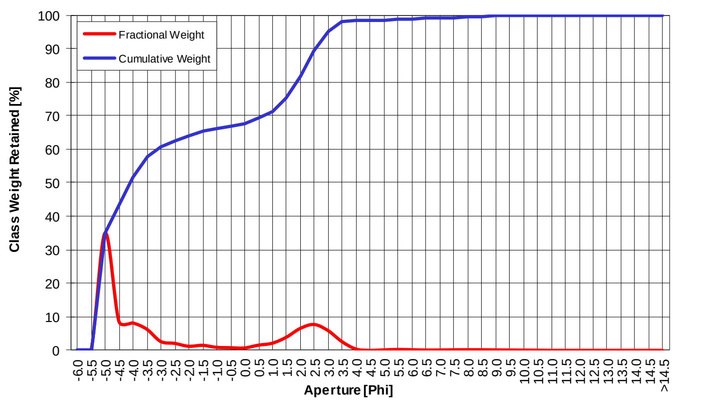


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE6_10

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	34.88	34.88
22400	-4.5	8.60	43.48
16000	-4.0	8.14	51.62
11200	-3.5	6.29	57.91
8000	-3.0	2.63	60.54
5600	-2.5	2.07	62.62
4000	-2.0	1.22	63.83
2800	-1.5	1.49	65.32
2000	-1.0	0.90	66.22
1400	-0.5	0.78	66.99
1000	0.0	0.71	67.70
707.00	0.5	1.53	69.24
500.00	1.0	2.11	71.35
353.60	1.5	3.87	75.22
250.00	2.0	6.49	81.72
176.80	2.5	7.69	89.41
125.00	3.0	5.90	95.31
88.39	3.5	2.60	97.91
63.00	4.0	0.40	98.31
44.20	4.5	0.00	98.31
31.30	5.0	0.13	98.44
22.10	5.5	0.27	98.71
15.60	6.0	0.18	98.89
11.00	6.5	0.10	99.00
7.80	7.0	0.11	99.11
5.50	7.5	0.16	99.27
3.90	8.0	0.19	99.46
2.75	8.5	0.18	99.63
1.95	9.0	0.14	99.77
1.38	9.5	0.11	99.88
0.98	10.0	0.08	99.96
0.69	10.5	0.04	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.12	Very Poorly Sorted
Skewness	0.69	Very Fine Skewed
Kurtosis	0.52	Very Platykurtic
Mean [µm]	5283.35	Pebble
Mean [phi]	-2.40	
Median [µm]	17110.64	Pebble
Median [phi]	-4.10	
Gravel [%]	66.22	Sandy Gravel
Sand [%]	32.09	
Mud [%]	1.69	



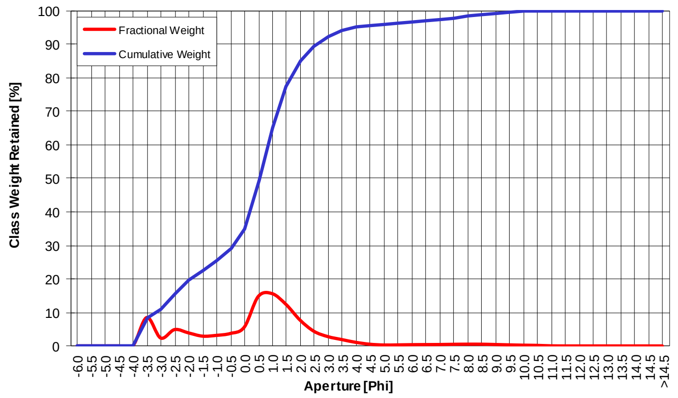
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE6_11

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	8.44	8.44
8000	-3.0	2.34	10.78
5600	-2.5	4.86	15.64
4000	-2.0	3.86	19.51
2800	-1.5	2.90	22.41
2000	-1.0	3.14	25.55
1400	-0.5	3.70	29.25
1000	0.0	5.58	34.83
707.00	0.5	14.68	49.51
500.00	1.0	15.52	65.03
353.60	1.5	12.30	77.34
250.00	2.0	7.67	85.00
176.80	2.5	4.34	89.34
125.00	3.0	2.76	92.11
88.39	3.5	1.89	93.99
63.00	4.0	1.07	95.06
44.20	4.5	0.51	95.57
31.30	5.0	0.28	95.85
22.10	5.5	0.31	96.16
15.60	6.0	0.37	96.52
11.00	6.5	0.40	96.92
7.80	7.0	0.42	97.34
5.50	7.5	0.48	97.82
3.90	8.0	0.52	98.34
2.75	8.5	0.51	98.84
1.95	9.0	0.42	99.26
1.38	9.5	0.31	99.58
0.98	10.0	0.22	99.80
0.69	10.5	0.17	99.97
0.49	11.0	0.03	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.25	Very Poorly Sorted
Skewness	-0.23	Coarse Skewed
Kurtosis	1.26	Leptokurtic
Mean [µm]	997.74	Coarse Sand
Mean [phi]	0.00	
Median [µm]	699.31	Coarse Sand
Median [phi]	0.52	
Gravel [%]	25.55	Gravelly Sand
Sand [%]	69.51	
Mud [%]	4.94	



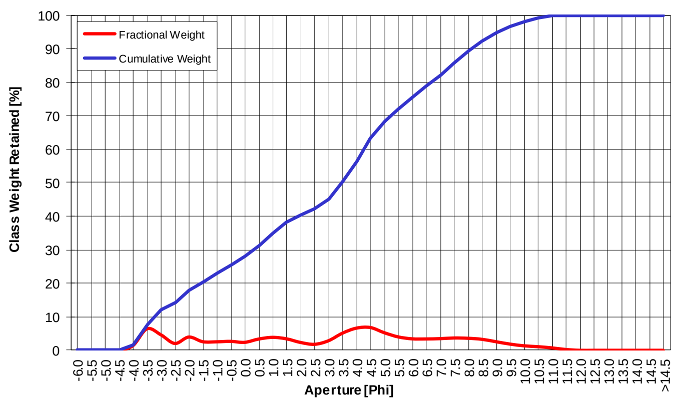
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7b_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	1.38	1.38
11200	-3.5	6.26	7.64
8000	-3.0	4.50	12.14
5600	-2.5	1.99	14.13
4000	-2.0	3.86	17.99
2800	-1.5	2.49	20.48
2000	-1.0	2.47	22.95
1400	-0.5	2.60	25.55
1000	0.0	2.31	27.86
707.00	0.5	3.27	31.13
500.00	1.0	3.77	34.90
353.60	1.5	3.33	38.23
250.00	2.0	2.28	40.51
176.80	2.5	1.74	42.25
125.00	3.0	2.77	45.02
88.39	3.5	4.97	49.99
63.00	4.0	6.44	56.43
44.20	4.5	6.63	63.07
31.30	5.0	5.12	68.19
22.10	5.5	3.90	72.09
15.60	6.0	3.33	75.42
11.00	6.5	3.30	78.72
7.80	7.0	3.39	82.11
5.50	7.5	3.58	85.69
3.90	8.0	3.50	89.19
2.75	8.5	3.20	92.39
1.95	9.0	2.50	94.89
1.38	9.5	1.81	96.70
0.98	10.0	1.31	98.01
0.69	10.5	1.05	99.06
0.49	11.0	0.71	99.77
0.34	11.5	0.23	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.31	Extremely Poorly Sorted
Skewness	-0.17	Coarse Skewed
Kurtosis	0.80	Platykurtic
Mean [µm]	139.67	Fine Sand
Mean [phi]	2.84	
Median [µm]	88.34	Very Fine Sand
Median [phi]	3.50	
Gravel [%]	22.95	Gravelly Mud
Sand [%]	33.49	
Mud [%]	43.57	



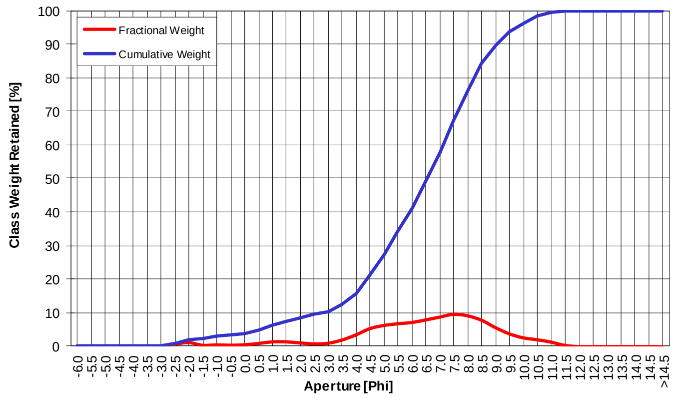
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7b_04

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.69	0.69
4000	-2.0	1.21	1.90
2800	-1.5	0.40	2.29
2000	-1.0	0.50	2.79
1400	-0.5	0.41	3.21
1000	0.0	0.53	3.74
707.00	0.5	0.93	4.67
500.00	1.0	1.39	6.06
353.60	1.5	1.41	7.47
250.00	2.0	1.09	8.56
176.80	2.5	0.81	9.37
125.00	3.0	0.98	10.35
88.39	3.5	1.94	12.29
63.00	4.0	3.44	15.73
44.20	4.5	5.29	21.03
31.30	5.0	6.23	27.26
22.10	5.5	6.75	34.01
15.60	6.0	7.12	41.13
11.00	6.5	7.87	49.00
7.80	7.0	8.71	57.70
5.50	7.5	9.53	67.23
3.90	8.0	9.12	76.35
2.75	8.5	7.84	84.20
1.95	9.0	5.66	89.85
1.38	9.5	3.80	93.66
0.98	10.0	2.60	96.26
0.69	10.5	2.03	98.30
0.49	11.0	1.33	99.63
0.34	11.5	0.37	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.50	Very Poorly Sorted
Skewness	-0.22	Coarse Skewed
Kurtosis	1.20	Leptokurtic
Mean [µm]	12.20	Fine Silt
Mean [phi]	6.36	
Median [µm]	10.57	Fine Silt
Median [phi]	6.56	
Gravel [%]	2.79	Slightly Gravelly Sandy Mud
Sand [%]	12.94	
Mud [%]	84.27	



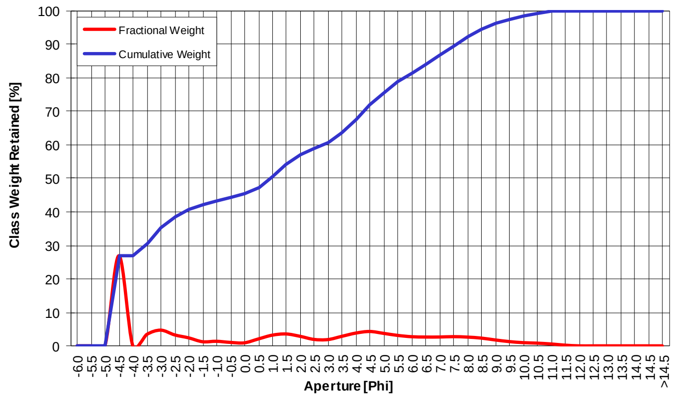
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7b_05

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	27.02	27.02
16000	-4.0	0.00	27.02
11200	-3.5	3.42	30.43
8000	-3.0	4.70	35.14
5600	-2.5	3.28	38.42
4000	-2.0	2.40	40.82
2800	-1.5	1.24	42.06
2000	-1.0	1.36	43.42
1400	-0.5	1.03	44.45
1000	0.0	0.90	45.35
707.00	0.5	2.06	47.40
500.00	1.0	3.20	50.60
353.60	1.5	3.56	54.16
250.00	2.0	2.86	57.02
176.80	2.5	1.93	58.95
125.00	3.0	1.88	60.83
88.39	3.5	2.85	63.68
63.00	4.0	3.82	67.50
44.20	4.5	4.31	71.81
31.30	5.0	3.74	75.55
22.10	5.5	3.13	78.68
15.60	6.0	2.74	81.42
11.00	6.5	2.64	84.06
7.80	7.0	2.65	86.71
5.50	7.5	2.75	89.46
3.90	8.0	2.62	92.08
2.75	8.5	2.32	94.41
1.95	9.0	1.77	96.17
1.38	9.5	1.28	97.46
0.98	10.0	0.96	98.42
0.69	10.5	0.81	99.22
0.49	11.0	0.57	99.79
0.34	11.5	0.21	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.85	Extremely Poorly Sorted
Skewness	0.07	Symmetrical
Kurtosis	0.59	Very Platykurtic
Mean [µm]	533.96	Coarse Sand
Mean [phi]	0.91	
Median [µm]	533.61	Coarse Sand
Median [phi]	0.91	
Gravel [%]	43.42	Muddy Gravel
Sand [%]	24.08	
Mud [%]	32.50	

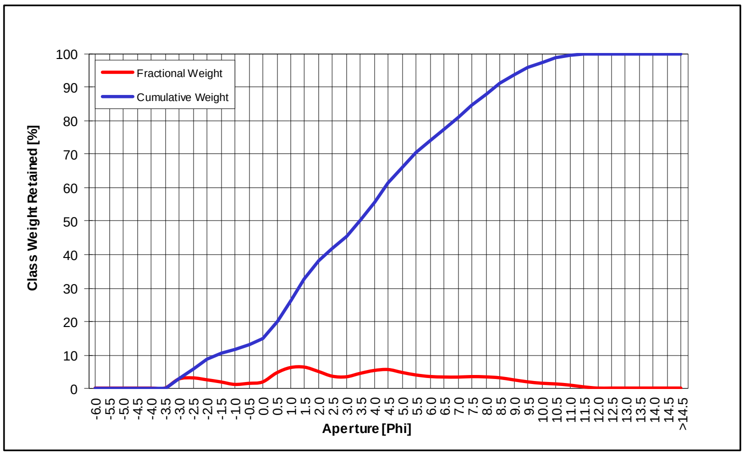


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7b_06

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	2.83	2.83
5600	-2.5	3.20	6.03
4000	-2.0	2.61	8.64
2800	-1.5	1.94	10.58
2000	-1.0	1.15	11.73
1400	-0.5	1.48	13.21
1000	0.0	1.91	15.12
707.00	0.5	4.75	19.87
500.00	1.0	6.43	26.30
353.60	1.5	6.58	32.88
250.00	2.0	5.23	38.11
176.80	2.5	3.73	41.84
125.00	3.0	3.54	45.38
88.39	3.5	4.62	50.00
63.00	4.0	5.52	55.52
44.20	4.5	5.82	61.34
31.30	5.0	4.91	66.25
22.10	5.5	4.12	70.37
15.60	6.0	3.62	73.99
11.00	6.5	3.48	77.47
7.80	7.0	3.45	80.92
5.50	7.5	3.60	84.52
3.90	8.0	3.51	88.03
2.75	8.5	3.24	91.27
1.95	9.0	2.59	93.86
1.38	9.5	1.96	95.82
0.98	10.0	1.52	97.35
0.69	10.5	1.31	98.66
0.49	11.0	0.95	99.61
0.34	11.5	0.39	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.64	Very Poorly Sorted
Skewness	0.02	Symmetrical
Kurtosis	0.93	Mesokurtic
Mean [µm]	78.26	Very Fine Sand
Mean [phi]	3.68	
Median [µm]	88.37	Very Fine Sand
Median [phi]	3.50	
Gravel [%]	11.73	Gravelly Mud
Sand [%]	43.79	
Mud [%]	44.48	



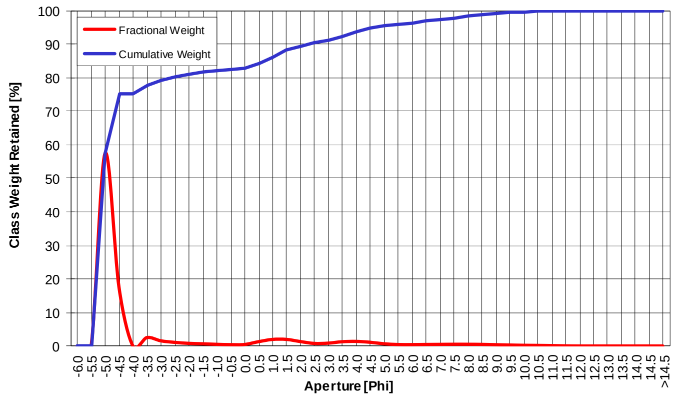
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7c_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	57.52	57.52
22400	-4.5	17.56	75.08
16000	-4.0	0.00	75.08
11200	-3.5	2.52	77.59
8000	-3.0	1.54	79.13
5600	-2.5	1.08	80.21
4000	-2.0	0.78	80.99
2800	-1.5	0.65	81.65
2000	-1.0	0.49	82.14
1400	-0.5	0.40	82.54
1000	0.0	0.44	82.98
707.00	0.5	1.28	84.26
500.00	1.0	1.96	86.22
353.60	1.5	1.97	88.19
250.00	2.0	1.32	89.51
176.80	2.5	0.76	90.27
125.00	3.0	0.85	91.12
88.39	3.5	1.27	92.39
63.00	4.0	1.37	93.76
44.20	4.5	1.11	94.87
31.30	5.0	0.66	95.52
22.10	5.5	0.44	95.96
15.60	6.0	0.41	96.37
11.00	6.5	0.45	96.82
7.80	7.0	0.48	97.30
5.50	7.5	0.51	97.81
3.90	8.0	0.51	98.32
2.75	8.5	0.47	98.79
1.95	9.0	0.38	99.17
1.38	9.5	0.28	99.45
0.98	10.0	0.21	99.66
0.69	10.5	0.17	99.84
0.49	11.0	0.12	99.96
0.34	11.5	0.04	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.96	Very Poorly Sorted
Skewness	0.91	Very Fine Skewed
Kurtosis	5.28	Extremely Leptokurtic
Mean [µm]	10064.70	Pebble
Mean [phi]	-3.33	
Median [µm]	33002.84	Pebble
Median [phi]	-5.04	
Gravel [%]	82.14	Gravel
Sand [%]	11.62	
Mud [%]	6.24	

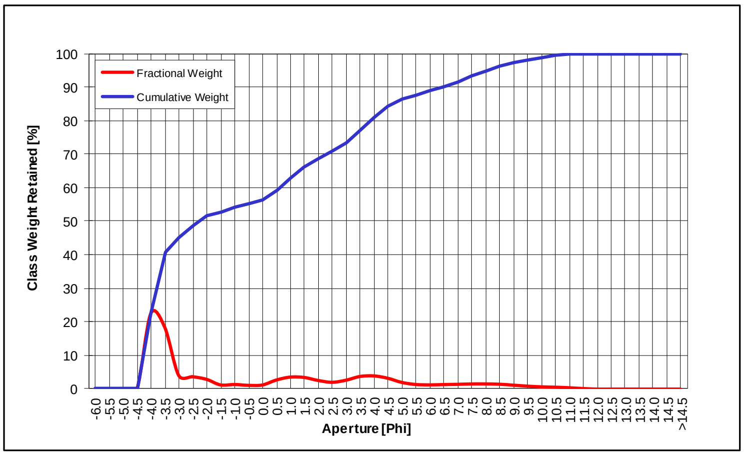


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7c_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	22.51	22.51
11200	-3.5	18.37	40.88
8000	-3.0	4.05	44.93
5600	-2.5	3.68	48.61
4000	-2.0	2.90	51.51
2800	-1.5	1.24	52.75
2000	-1.0	1.36	54.12
1400	-0.5	1.12	55.23
1000	0.0	1.22	56.45
707.00	0.5	2.69	59.14
500.00	1.0	3.56	62.70
353.60	1.5	3.46	66.16
250.00	2.0	2.57	68.73
176.80	2.5	2.02	70.75
125.00	3.0	2.64	73.39
88.39	3.5	3.74	77.13
63.00	4.0	3.92	81.05
44.20	4.5	3.22	84.28
31.30	5.0	2.00	86.27
22.10	5.5	1.37	87.64
15.60	6.0	1.25	88.89
11.00	6.5	1.34	90.23
7.80	7.0	1.42	91.65
5.50	7.5	1.53	93.18
3.90	8.0	1.53	94.71
2.75	8.5	1.45	96.16
1.95	9.0	1.17	97.33
1.38	9.5	0.88	98.22
0.98	10.0	0.67	98.88
0.69	10.5	0.56	99.44
0.49	11.0	0.40	99.84
0.34	11.5	0.16	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.04	No Data
Skewness	0.61	No Data
Kurtosis	0.72	No Data
Mean [µm]	1564.54	Very Coarse Sand
Mean [phi]	-0.65	
Median [µm]	4765.78	Pebble
Median [phi]	-2.25	
Gravel [%]	54.12	Muddy Sandy Gravel
Sand [%]	26.94	
Mud [%]	18.95	

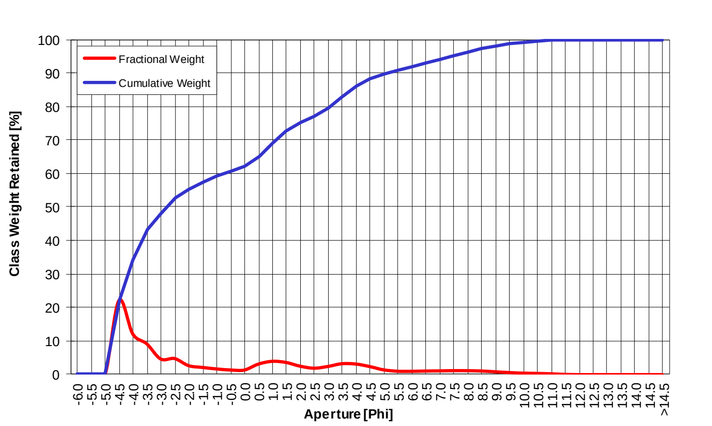


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7c_03

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	22.03	22.03
16000	-4.0	12.07	34.10
11200	-3.5	9.16	43.26
8000	-3.0	4.65	47.91
5600	-2.5	4.78	52.69
4000	-2.0	2.68	55.36
2800	-1.5	2.14	57.51
2000	-1.0	1.70	59.20
1400	-0.5	1.39	60.59
1000	0.0	1.37	61.96
707.00	0.5	3.12	65.08
500.00	1.0	3.96	69.04
353.60	1.5	3.62	72.66
250.00	2.0	2.52	75.18
176.80	2.5	1.92	77.10
125.00	3.0	2.44	79.54
88.39	3.5	3.25	82.79
63.00	4.0	3.15	85.94
44.20	4.5	2.40	88.35
31.30	5.0	1.42	89.77
22.10	5.5	1.01	90.78
15.60	6.0	0.99	91.77
11.00	6.5	1.07	92.84
7.80	7.0	1.12	93.95
5.50	7.5	1.18	95.14
3.90	8.0	1.17	96.31
2.75	8.5	1.08	97.39
1.95	9.0	0.85	98.24
1.38	9.5	0.62	98.85
0.98	10.0	0.45	99.30
0.69	10.5	0.37	99.66
0.49	11.0	0.25	99.92
0.34	11.5	0.08	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.94	Very Poorly Sorted
Skewness	0.61	Very Fine Skewed
Kurtosis	0.80	Platykurtic
Mean [µm]	2354.78	Granule
Mean [phi]	-1.24	
Median [µm]	6842.66	Pebble
Median [phi]	-2.77	
Gravel [%]	59.20	Muddy Sandy Gravel
Sand [%]	26.74	
Mud [%]	14.06	



Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7c_04

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.04	0.04
2000	-1.0	0.03	0.07
1400	-0.5	0.03	0.10
1000	0.0	0.05	0.15
707.00	0.5	0.14	0.29
500.00	1.0	0.09	0.38
353.60	1.5	0.01	0.39
250.00	2.0	0.28	0.67
176.80	2.5	4.22	4.89
125.00	3.0	11.77	16.67
88.39	3.5	17.65	34.32
63.00	4.0	16.42	50.74
44.20	4.5	10.88	61.62
31.30	5.0	4.88	66.50
22.10	5.5	2.85	69.35
15.60	6.0	3.27	72.63
11.00	6.5	4.09	76.72
7.80	7.0	4.37	81.09
5.50	7.5	4.41	85.50
3.90	8.0	4.03	89.53
2.75	8.5	3.42	92.95
1.95	9.0	2.47	95.42
1.38	9.5	1.67	97.09
0.98	10.0	1.16	98.25
0.69	10.5	0.95	99.20
0.49	11.0	0.64	99.85
0.34	11.5	0.15	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.06	Very Poorly Sorted
Skewness	0.54	Very Fine Skewed
Kurtosis	0.86	Platykurtic
Mean [µm]	36.97	Coarse Silt
Mean [phi]	4.76	
Median [µm]	63.97	Very Fine Sand
Median [phi]	3.97	
Gravel [%]	0.07	Slightly Gravelly Muddy Sand
Sand [%]	50.67	
Mud [%]	49.26	

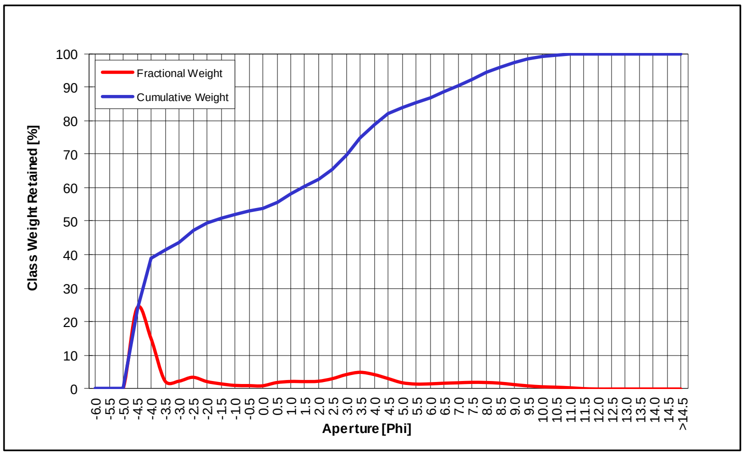
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7d_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	23.92	23.92
16000	-4.0	15.00	38.92
11200	-3.5	2.43	41.35
8000	-3.0	2.31	43.66
5600	-2.5	3.46	47.12
4000	-2.0	2.21	49.33
2800	-1.5	1.53	50.86
2000	-1.0	1.06	51.92
1400	-0.5	1.00	52.92
1000	0.0	0.95	53.87
707.00	0.5	1.88	55.75
500.00	1.0	2.22	57.98
353.60	1.5	2.20	60.17
250.00	2.0	2.29	62.46
176.80	2.5	3.04	65.50
125.00	3.0	4.26	69.76
88.39	3.5	4.93	74.69
63.00	4.0	4.28	78.97
44.20	4.5	3.09	82.06
31.30	5.0	1.87	83.93
22.10	5.5	1.46	85.39
15.60	6.0	1.52	86.90
11.00	6.5	1.70	88.61
7.80	7.0	1.83	90.44
5.50	7.5	1.97	92.41
3.90	8.0	1.92	94.33
2.75	8.5	1.73	96.06
1.95	9.0	1.32	97.38
1.38	9.5	0.93	98.31
0.98	10.0	0.66	98.98
0.69	10.5	0.54	99.52
0.49	11.0	0.37	99.89
0.34	11.5	0.11	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	4.40	Extremely Poorly Sorted
Skewness	0.47	Very Fine Skewed
Kurtosis	0.67	Platykurtic
Mean [µm]	1382.05	Very Coarse Sand
Mean [phi]	-0.47	
Median [µm]	3419.40	Granule
Median [phi]	-1.77	
Gravel [%]	51.92	Muddy Sandy Gravel
Sand [%]	27.05	
Mud [%]	21.03	

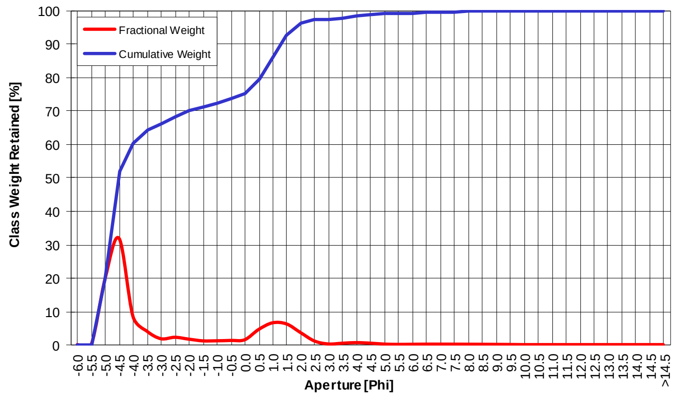


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7d_03

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	19.93	19.93
22400	-4.5	32.04	51.97
16000	-4.0	8.44	60.41
11200	-3.5	4.04	64.45
8000	-3.0	1.78	66.23
5600	-2.5	2.21	68.44
4000	-2.0	1.65	70.09
2800	-1.5	1.14	71.23
2000	-1.0	1.16	72.39
1400	-0.5	1.26	73.65
1000	0.0	1.47	75.12
707.00	0.5	4.56	79.68
500.00	1.0	6.58	86.26
353.60	1.5	6.24	92.50
250.00	2.0	3.64	96.14
176.80	2.5	1.09	97.23
125.00	3.0	0.20	97.43
88.39	3.5	0.42	97.85
63.00	4.0	0.60	98.46
44.20	4.5	0.44	98.90
31.30	5.0	0.16	99.06
22.10	5.5	0.07	99.13
15.60	6.0	0.10	99.24
11.00	6.5	0.14	99.38
7.80	7.0	0.15	99.53
5.50	7.5	0.14	99.66
3.90	8.0	0.12	99.78
2.75	8.5	0.10	99.88
1.95	9.0	0.07	99.95
1.38	9.5	0.05	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.57	Very Poorly Sorted
Skewness	0.79	Very Fine Skewed
Kurtosis	0.61	Very Platykurtic
Mean [µm]	7579.00	Pebble
Mean [phi]	-2.92	
Median [µm]	22874.50	Pebble
Median [phi]	-4.52	
Gravel [%]	72.39	Sandy Gravel
Sand [%]	26.07	
Mud [%]	1.54	



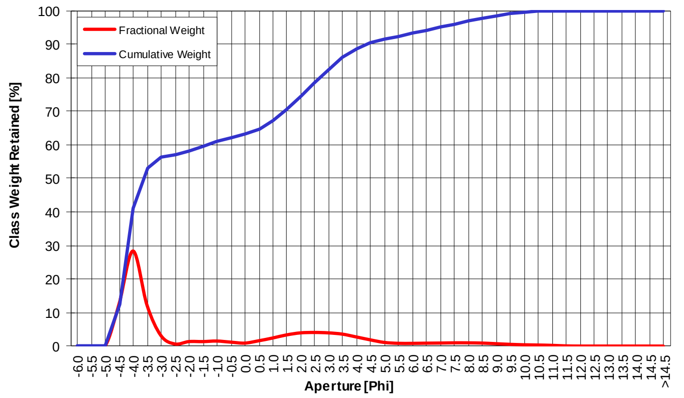
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7e_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	12.55	12.55
16000	-4.0	28.37	40.92
11200	-3.5	12.23	53.15
8000	-3.0	3.12	56.28
5600	-2.5	0.62	56.90
4000	-2.0	1.34	58.24
2800	-1.5	1.34	59.58
2000	-1.0	1.50	61.08
1400	-0.5	1.18	62.25
1000	0.0	0.88	63.13
707.00	0.5	1.57	64.71
500.00	1.0	2.40	67.11
353.60	1.5	3.33	70.44
250.00	2.0	3.94	74.38
176.80	2.5	4.06	78.44
125.00	3.0	3.94	82.38
88.39	3.5	3.56	85.94
63.00	4.0	2.72	88.67
44.20	4.5	1.85	90.52
31.30	5.0	1.09	91.61
22.10	5.5	0.82	92.43
15.60	6.0	0.81	93.23
11.00	6.5	0.86	94.10
7.80	7.0	0.90	95.00
5.50	7.5	0.96	95.96
3.90	8.0	0.96	96.92
2.75	8.5	0.89	97.81
1.95	9.0	0.70	98.52
1.38	9.5	0.52	99.03
0.98	10.0	0.38	99.42
0.69	10.5	0.31	99.73
0.49	11.0	0.22	99.94
0.34	11.5	0.06	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.70	Very Poorly Sorted
Skewness	0.80	Very Fine Skewed
Kurtosis	0.76	Platykurtic
Mean [µm]	3043.46	Granule
Mean [phi]	-1.61	
Median [µm]	12278.23	Pebble
Median [phi]	-3.62	
Gravel [%]	61.08	Muddy Sandy Gravel
Sand [%]	27.59	
Mud [%]	11.33	



Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7e_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.02	0.02
2000	-1.0	0.05	0.07
1400	-0.5	0.03	0.10
1000	0.0	0.07	0.16
707.00	0.5	0.32	0.49
500.00	1.0	0.36	0.85
353.60	1.5	1.34	2.19
250.00	2.0	4.21	6.40
176.80	2.5	8.44	14.84
125.00	3.0	11.54	26.38
88.39	3.5	11.38	37.76
63.00	4.0	8.49	46.25
44.20	4.5	5.96	52.21
31.30	5.0	4.38	56.59
22.10	5.5	4.36	60.95
15.60	6.0	4.87	65.82
11.00	6.5	5.44	71.26
7.80	7.0	5.71	76.97
5.50	7.5	5.81	82.78
3.90	8.0	5.20	87.98
2.75	8.5	4.21	92.18
1.95	9.0	2.87	95.05
1.38	9.5	1.84	96.89
0.98	10.0	1.25	98.14
0.69	10.5	1.02	99.16
0.49	11.0	0.69	99.84
0.34	11.5	0.16	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

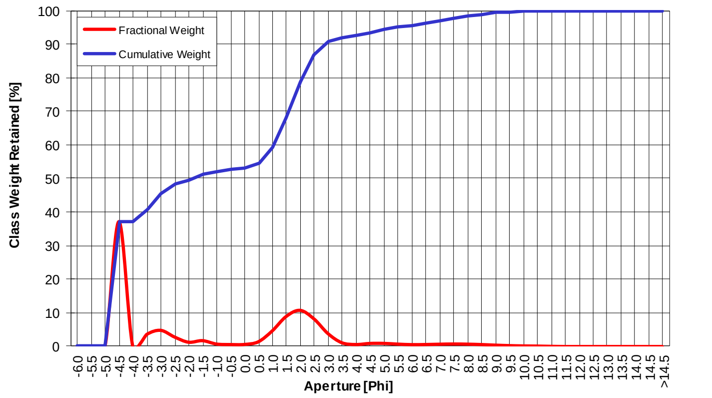
Sorting	2.35	Very Poorly Sorted
Skewness	0.31	Very Fine Skewed
Kurtosis	0.75	Platykurtic
Mean [µm]	35.22	Coarse Silt
Mean [phi]	4.83	
Median [µm]	50.41	Coarse Silt
Median [phi]	4.31	
Gravel [%]	0.07	Slightly Gravelly Sandy Mud
Sand [%]	46.18	
Mud [%]	53.75	

Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7e_03

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	37.03	37.03
16000	-4.0	0.00	37.03
11200	-3.5	3.60	40.62
8000	-3.0	4.80	45.42
5600	-2.5	2.80	48.22
4000	-2.0	1.28	49.50
2800	-1.5	1.74	51.24
2000	-1.0	0.73	51.97
1400	-0.5	0.58	52.55
1000	0.0	0.61	53.17
707.00	0.5	1.39	54.56
500.00	1.0	4.61	59.17
353.60	1.5	8.89	68.07
250.00	2.0	10.72	78.79
176.80	2.5	8.18	86.98
125.00	3.0	3.85	90.82
88.39	3.5	1.12	91.94
63.00	4.0	0.59	92.53
44.20	4.5	0.91	93.44
31.30	5.0	0.93	94.37
22.10	5.5	0.71	95.09
15.60	6.0	0.56	95.65
11.00	6.5	0.59	96.24
7.80	7.0	0.68	96.92
5.50	7.5	0.75	97.67
3.90	8.0	0.70	98.37
2.75	8.5	0.58	98.95
1.95	9.0	0.41	99.36
1.38	9.5	0.27	99.63
0.98	10.0	0.18	99.81
0.69	10.5	0.13	99.95
0.49	11.0	0.05	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	3.34	Very Poorly Sorted
Skewness	0.29	Fine Skewed
Kurtosis	0.66	Very Platykurtic
Mean [µm]	2699.48	Granule
Mean [phi]	-1.43	
Median [µm]	3608.56	Granule
Median [phi]	-1.85	
Gravel [%]	51.97	Muddy Sandy Gravel
Sand [%]	40.56	
Mud [%]	7.47	



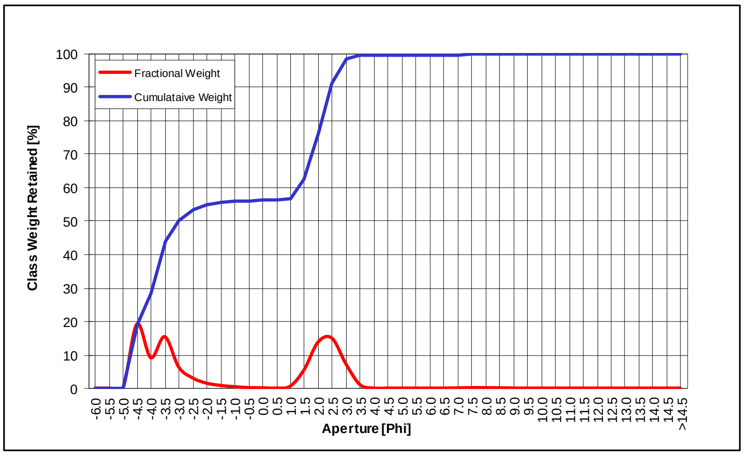
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7f_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	19.27	19.27
16000	-4.0	9.14	28.40
11200	-3.5	15.48	43.88
8000	-3.0	6.34	50.22
5600	-2.5	3.05	53.27
4000	-2.0	1.48	54.76
2800	-1.5	0.80	55.56
2000	-1.0	0.42	55.98
1400	-0.5	0.15	56.13
1000	0.0	0.09	56.22
707.00	0.5	0.00	56.22
500.00	1.0	0.58	56.80
353.60	1.5	5.54	62.34
250.00	2.0	13.85	76.19
176.80	2.5	15.02	91.21
125.00	3.0	7.28	98.49
88.39	3.5	1.07	99.55
63.00	4.0	0.00	99.55
44.20	4.5	0.00	99.55
31.30	5.0	0.00	99.55
22.10	5.5	0.00	99.55
15.60	6.0	0.00	99.55
11.00	6.5	0.00	99.55
7.80	7.0	0.07	99.62
5.50	7.5	0.14	99.76
3.90	8.0	0.13	99.88
2.75	8.5	0.09	99.98
1.95	9.0	0.02	100.00
1.38	9.5	0.00	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.86	Very Poorly Sorted
Skewness	0.53	Very Fine Skewed
Kurtosis	0.51	Very Platykurtic
Mean [µm]	3423.04	Granule
Mean [phi]	-1.78	
Median [µm]	8094.37	Pebble
Median [phi]	-3.02	
Gravel [%]	55.98	Sandy Gravel
Sand [%]	43.42	
Mud [%]	0.45	

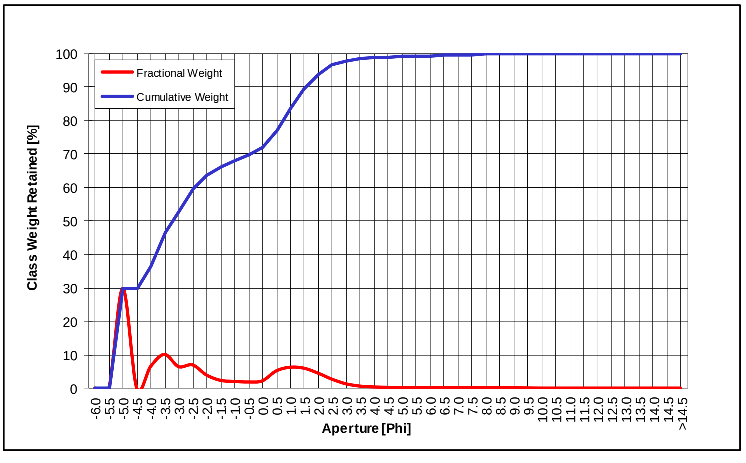


Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7g_01

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	29.82	29.82
22400	-4.5	0.00	29.82
16000	-4.0	6.52	36.33
11200	-3.5	10.08	46.41
8000	-3.0	6.42	52.83
5600	-2.5	6.94	59.77
4000	-2.0	3.92	63.69
2800	-1.5	2.33	66.02
2000	-1.0	1.99	68.01
1400	-0.5	1.83	69.84
1000	0.0	2.16	72.00
707.00	0.5	5.13	77.14
500.00	1.0	6.24	83.38
353.60	1.5	5.94	89.32
250.00	2.0	4.48	93.80
176.80	2.5	2.66	96.46
125.00	3.0	1.29	97.75
88.39	3.5	0.60	98.35
63.00	4.0	0.34	98.69
44.20	4.5	0.23	98.92
31.30	5.0	0.14	99.06
22.10	5.5	0.09	99.15
15.60	6.0	0.09	99.24
11.00	6.5	0.11	99.35
7.80	7.0	0.13	99.48
5.50	7.5	0.14	99.63
3.90	8.0	0.14	99.76
2.75	8.5	0.11	99.88
1.95	9.0	0.08	99.96
1.38	9.5	0.04	100.00
0.98	10.0	0.00	100.00
0.69	10.5	0.00	100.00
0.49	11.0	0.00	100.00
0.34	11.5	0.00	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.72	Very Poorly Sorted
Skewness	0.39	Very Fine Skewed
Kurtosis	0.58	Very Platykurtic
Mean [µm]	5498.86	Pebble
Mean [phi]	-2.46	
Median [µm]	9278.67	Pebble
Median [phi]	-3.21	
Gravel [%]	68.01	Sandy Gravel
Sand [%]	30.68	
Mud [%]	1.31	



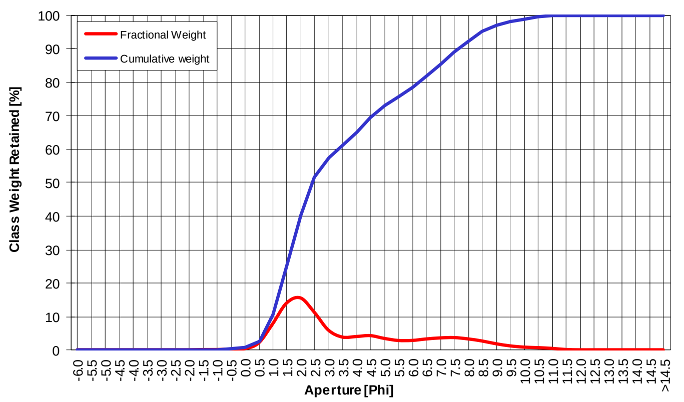
Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

FE7g_02

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.00	0.00
4000	-2.0	0.00	0.00
2800	-1.5	0.08	0.08
2000	-1.0	0.09	0.16
1400	-0.5	0.20	0.36
1000	0.0	0.34	0.70
707.00	0.5	2.05	2.75
500.00	1.0	7.78	10.53
353.60	1.5	14.05	24.58
250.00	2.0	15.61	40.19
176.80	2.5	11.24	51.43
125.00	3.0	5.92	57.35
88.39	3.5	3.83	61.18
63.00	4.0	4.00	65.18
44.20	4.5	4.27	69.45
31.30	5.0	3.43	72.89
22.10	5.5	2.81	75.70
15.60	6.0	2.82	78.52
11.00	6.5	3.26	81.78
7.80	7.0	3.58	85.36
5.50	7.5	3.68	89.04
3.90	8.0	3.28	92.32
2.75	8.5	2.66	94.98
1.95	9.0	1.83	96.81
1.38	9.5	1.19	98.01
0.98	10.0	0.81	98.82
0.69	10.5	0.65	99.47
0.49	11.0	0.43	99.90
0.34	11.5	0.10	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	> 14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.60	Very Poorly Sorted
Skewness	0.55	Very Fine Skewed
Kurtosis	0.83	Platykurtic
Mean [µm]	89.52	Very Fine Sand
Mean [phi]	3.48	
Median [µm]	184.76	Fine Sand
Median [phi]	2.44	
Gravel [%]	0.16	Slightly Gravelly Muddy Sand
Sand [%]	65.02	
Mud [%]	34.82	



Based on Wentworth (1922) Grain Size Classification
Statistics Based on Folk and Ward (1957)

FE7g_03

Aperture [µm]	Aperture [Phi]	Fractional [%]	Cumulative [%]
63000	-6.0	0.00	0.00
45000	-5.5	0.00	0.00
31500	-5.0	0.00	0.00
22400	-4.5	0.00	0.00
16000	-4.0	0.00	0.00
11200	-3.5	0.00	0.00
8000	-3.0	0.00	0.00
5600	-2.5	0.19	0.19
4000	-2.0	0.18	0.38
2800	-1.5	0.01	0.39
2000	-1.0	0.06	0.45
1400	-0.5	0.07	0.52
1000	0.0	0.07	0.59
707.00	0.5	0.21	0.80
500.00	1.0	5.05	5.84
353.60	1.5	13.86	19.70
250.00	2.0	18.94	38.64
176.80	2.5	15.44	54.08
125.00	3.0	7.86	61.95
88.39	3.5	3.08	65.03
63.00	4.0	2.20	67.23
44.20	4.5	2.81	70.04
31.30	5.0	2.88	72.92
22.10	5.5	2.86	75.78
15.60	6.0	3.08	78.86
11.00	6.5	3.47	82.33
7.80	7.0	3.64	85.97
5.50	7.5	3.60	89.57
3.90	8.0	3.14	92.71
2.75	8.5	2.53	95.24
1.95	9.0	1.76	97.00
1.38	9.5	1.15	98.15
0.98	10.0	0.77	98.92
0.69	10.5	0.60	99.52
0.49	11.0	0.39	99.92
0.34	11.5	0.08	100.00
0.24	12.0	0.00	100.00
0.17	12.5	0.00	100.00
0.12	13.0	0.00	100.00
0.09	13.5	0.00	100.00
0.06	14.0	0.00	100.00
0.04	14.5	0.00	100.00
< 0.04	>14.5	0.00	100.00
Total		100.00	100.00

Sorting	2.48	Very Poorly Sorted
Skewness	0.62	Very Fine Skewed
Kurtosis	0.83	Platykurtic
Mean [µm]	89.04	Very Fine Sand
Mean [phi]	3.49	
Median [µm]	193.76	Fine Sand
Median [phi]	2.37	
Gravel [%]	0.45	Slightly Gravelly Muddy Sand
Sand [%]	66.78	
Mud [%]	32.77	

Based on Wentworth (1922) Grain Size Classification

Statistics Based on Folk and Ward (1957)

Subtidal Grab Samples Photographs
Export Cable Route


Station FE4_01


Station FE4_02


Station FE4_03


Station FE4_04

Station FE4_05

Station FE4_06

Station FE4_07

Station FE4_08

Station FE5_01

Station FE5_02

Station FE5_03

Station FE5_04

Station FE5_05

Station FE5_06

Station FE5_07

Station FE5_08

Station FE5_09

Appendix E

Chemistry Analysis Certificates

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID	**MAR01220**	
Issue Version	1	
Customer	Fugro GB Marine Ltd	
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1	
Date Sampled	09-15-Nov-2021	
Date Received	25-Nov-21	
Date Reported	22-Dec-21	
Condition of samples	Frozen	Satisfactory

M. Hubbard

Authorised by: Marya Hubbard

Position: Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.04	0.5	0.5	0.01	0.5	0.5
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)
FE3_01	MAR01220.001	Sediment	18.8	0.08	6.9	5.2	0.02	9.6	4.4
FE5_09	MAR01220.002	Sediment	46.1	0.28	42.9	31.3	0.05	55.9	15.6
FE7b_02	MAR01220.003	Sediment	14.2	0.14	19.9	15.1	0.07	16.0	17.3
FE7b_04	MAR01220.004	Sediment	39.3	0.31	20.7	21.5	0.10	56.0	17.1
FE7c_04	MAR01220.005	Sediment	10.7	0.09	13.9	9.6	0.05	11.3	12.7
FE7g_03	MAR01220.006	Sediment	9.7	0.10	12.1	9.5	0.04	9.4	12.3
Certified Reference Material SETOC 774 (% Recovery)			105	107	102.0	101	10'	103	103
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.01	<0.5	<0.5

* See Report Notes

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	2	10	1	0.5
		Accreditation	UKAS/MMO	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc (Zn)**	**Aluminium as Al**	**Barium as Ba**	**Tin as Sn**
FE3_01	MAR01220.001	Sediment	14.4	3160	12*	<0.5
FE5_09	MAR01220.002	Sediment	85.6	21100	10*	1.0
FE7b_02	MAR01220.003	Sediment	53.4	8930	62.3	1.1
FE7b_04	MAR01220.004	Sediment	62.3	10500	55.9	1.0
FE7c_04	MAR01220.005	Sediment	37.6	5850	53.9	0.8
FE7g_03	MAR01220.006	Sediment	38.1	4200	48.8	0.7
Certified Reference Material SETOC 774 (% Recovery)			102	95	98	103
QC Blank			<2	<10	<1	<0.5

* See Report Notes

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID MAR01220
Issue Version 1
Customer Reference 200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	0.001	0.001
		Accreditation	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
FE3_01	MAR01220.001	Sediment	<0.005	<0.005
FE5_09	MAR01220.002	Sediment	<0.005	<0.005
FE7b_02	MAR01220.003	Sediment	<0.005	<0.005
FE7b_04	MAR01220.004	Sediment	<0.005	<0.005
FE7c_04	MAR01220.005	Sediment	<0.005	<0.005
FE7g_03	MAR01220.006	Sediment	<0.005	<0.005
Certified Reference Material BCR-646 (% Recovery)			114	72
QC Blank			<0.001	<0.001

* See report notes

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
FE3_01	MAR01220.001	Sediment	<1	<1	<1	<1	<1	<1
FE5_09	MAR01220.002	Sediment	<1	<1	<1	1.11	<1	1.78
FE7b_02	MAR01220.003	Sediment	5.27	4.48	10.1	24.9	32.1	33.2
FE7b_04	MAR01220.004	Sediment	1.73	1.97	5.06	9.32	10.5	15.3
FE7c_04	MAR01220.005	Sediment	2.80	4.19	8.23	17.9	16.7	25.7
FE7g_03	MAR01220.006	Sediment	2.04	1.87	5.17	11.9	12.5	18.0
Certified Reference Material Quasimeme QPH097MS (% Recovery)			67	102	77	80	80	75
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.
For full analyte name see method summaries

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	MMO	MMO	MMO
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BEP**	**BKF**	**C1N**	**C1PHEN**	**C2N**
FE3_01	MAR01220.001	Sediment	<1	<1	<1	<1	<1	<1
FE5_09	MAR01220.002	Sediment	<1	1.98	1.38	5.93	4.17	7.36
FE7b_02	MAR01220.003	Sediment	33.7	46.5	28.1	129	72.1	10'
FE7b_04	MAR01220.004	Sediment	14.6	18.9	8.00	44.9	27.2	37.7
FE7c_04	MAR01220.005	Sediment	21.2	29.1	18.7	81.3	44.9	61.8
FE7g_03	MAR01220.006	Sediment	15.5	19.5	13.5	53.9	33.0	44.7
Certified Reference Material Quasimeme QPH097MS (% Recovery)			84	82	95	96	75	106
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.
For full analyte name see method summaries

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	MMO	MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**C3N**	**CHRYSENE**	**DBENZAH**	**FLUORANT**	**FLUORENE**	**INDPYR**
FE3_01	MAR01220.001	Sediment	<1	<1	<1	<1	<1	<1
FE5_09	MAR01220.002	Sediment	4.22	1.46	<1	4.38	<1	<1
FE7b_02	MAR01220.003	Sediment	79.9	33.6	3.40	59.6	9.16	25.4
FE7b_04	MAR01220.004	Sediment	28.8	16.5	1.50	24.9	3.59	8.31
FE7c_04	MAR01220.005	Sediment	48.8	28.0	2.78	39.7	5.93	14.9
FE7g_03	MAR01220.006	Sediment	36.4	18.5	1.50	28.7	3.85	10.2
Certified Reference Material Quasimeme QPH097MS (% Recovery)			85	85	69	75	91	88
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.
For full analyte name see method summaries

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID MAR01220
Issue Version 1
Customer Reference 200867 Five Estuaries MMO Analysis - Batch 1

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	mg/Kg
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/305
		Limit of Detection	1	1	1	1	1
		Accreditation	UKAS/MMO	MMO	UKAS/MMO	UKAS/MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	NAPTH	PERYLENE	PHENANT	PYRENE	THC
FE3_01	MAR01220.001	Sediment	<1	<1	<1	<1	<1
FE5_09	MAR01220.002	Sediment	2.31	<1	3.81	4.61	<1
FE7b_02	MAR01220.003	Sediment	42.8	17.9	64.9	54.6	9.56
FE7b_04	MAR01220.004	Sediment	14.7	9.25	22.2	26.1	8.24
FE7c_04	MAR01220.005	Sediment	30.5	12.9	39.2	38.4	10.3
FE7g_03	MAR01220.006	Sediment	20.1	9.33	27.2	27.9	9.78
Certified Reference Material Quasimeme QPH097MS (% Recovery)			98	84	72	80	100~
QC Blank			<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.
For full analyte name see method summaries

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB 101**	**PCB 105**	**PCB 110**	**PCB 118**	**PCB 128**	**PCB 138**	**PCB 141**	**PCB 149**
FE3_01	MAR01220.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE5_09	MAR01220.002	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7b_02	MAR01220.003	Sediment	0.00012	<0.00008	0.00016	0.00016	<0.00008	0.00012	<0.00008	0.00011
FE7b_04	MAR01220.004	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00008	<0.00008	<0.00008
FE7c_04	MAR01220.005	Sediment	<0.00008	<0.00008	<0.00008	0.00009	<0.00008	<0.00008	<0.00008	<0.00008
FE7g_03	MAR01220.006	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			96	79	113	101	109~	11´	108	98
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID MAR01220
Issue Version 1
Customer Reference 200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 151	PCB 153	PCB 156	PCB 158	PCB 170	PCB 18	PCB 180
FE3_01	MAR01220.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE5_09	MAR01220.002	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7b_02	MAR01220.003	Sediment	<0.00008	0.00022	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7b_04	MAR01220.004	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7c_04	MAR01220.005	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7g_03	MAR01220.006	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			87	98	95	118	75	90	91
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 183	PCB 187	PCB 194	PCB 28	PCB 31	PCB 44	PCB 47
FE3_01	MAR01220.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE5_09	MAR01220.002	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7b_02	MAR01220.003	Sediment	<0.00008	<0.00008	<0.00008	0.00009	<0.00008	<0.00008	<0.00008
FE7b_04	MAR01220.004	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7c_04	MAR01220.005	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7g_03	MAR01220.006	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			106~	100	81	74	116	93	107~
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 49	PCB 52	PCB 66
FE3_01	MAR01220.001	Sediment	<0.00008	<0.00008	<0.00008
FE5_09	MAR01220.002	Sediment	<0.00008	<0.00008	<0.00008
FE7b_02	MAR01220.003	Sediment	<0.00008	<0.00008	0.00010
FE7b_04	MAR01220.004	Sediment	<0.00008	<0.00008	<0.00008
FE7c_04	MAR01220.005	Sediment	<0.00008	<0.00008	<0.00008
FE7g_03	MAR01220.006	Sediment	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			107	96	11~
QC Blank			<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

		Units	mg/Kg (Dry Weight)							
		Method No	ASC/SOP/302							
		Limit of Detection	0.0001							
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCB	PPTDE	PPDDE	PPDDT
FE3_01	MAR01220.001	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FE5_09	MAR01220.002	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FE7b_02	MAR01220.003	Sediment	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	0.0002	0.0003	<0.0001
FE7b_04	MAR01220.004	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
FE7c_04	MAR01220.005	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0001	<0.0001
FE7g_03	MAR01220.006	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Certified Reference Material Quasimeme QOR147MS (% Recovery)			123~	99~	122~	108	103	56	83	95~
QC Blank			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.
For full analyte name see method summaries

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID MAR01220
Issue Version 1

Customer Reference 200867 Five Estuaries MMO Analysis - Batch 1

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SOCOTEC Env Chem*	MAR01220.001-006	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ASC/SOP/301	MAR01220.001-006	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303/304	MAR01220.002-006	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved in the PAHSED UKAS accredited method. Chrysene and Triphenylene are resolved for MMO but this is currently not UKAS accredited therefore Chrysene is reported without this acccreditation.

DEVIATING SAMPLE STATEMENT

Deviation Code	Deviation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A
D12	Sample integrity compromised or not suitable for analysis	N/A	N/A

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01220
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 1

Method	Sample and Fraction Size	Method Summary
Metals	Air dried	Aqua-regia extraction followed by ICP analysis.
Organotins	Wet Sediment	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment	Solvent extraction and clean up followed by GC-MS analysis.
Total Hydrocarbon Content (THC)	Wet Sediment	Ultra-violet fluorescence spectroscopy
Polychlorinated Biphenyls (PCBs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.
Organochlorine Pesticides (OCPs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.

Analyte Definitions					
Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name
ACENAPTH	Acenaphthene	C2N	C2-naphthalenes	THC	Total Hydrocarbon Content
ACENAPHY	Acenaphthylene	C3N	C3-naphthalenes	AHCH	alpha-Hexachlorocyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorocyclohexane
BAA	Benzo[a]anthracene	DBENZAH	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorocyclohexane
BAP	Benzo[a]pyrene	FLUORANT	Fluoranthene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	FLUORENE	Fluorene	HCB	Hexachlorobenzene
BEP	Benzo[e]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	PPDDE	p,p'-Dichlorodiphenyldichloroethylene
BENZGHIP	Benzo[ghi]perylene	NAPTH	Naphthalene	PPDDT	p,p'-Dichlorodiphenyltrichloroethane
BKF	Benzo[k]fluoranthene	PERYLENE	Perylene	PPTDE	p,p'-Dichlorodiphenyldichloroethane
C1N	C1-naphthalenes	PHENANT	Phenanthrene		
C1PHEN	C1-phenanthrene	PYRENE	Pyrene		

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR01229
Issue Version	1
Customer	Fugro GB Marine Ltd, Unit 16 Trafalgar Wharf, Hamilton Road, Portchester, PO6 4PX
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2
Date Sampled	25/07 & 09-12/11/2021
Date Received	30-Nov-21
Date Reported	06-Jan-22
Condition of samples	Frozen Satisfactory

M. Hubbard

Authorised by: Marya Hubbard

Position: Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.04	0.5	0.5	0.01	0.5	0.5
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic (As)**	**Cadmium (Cd)**	**Chromium (Cr)**	**Copper (Cu)**	**Mercury (Hg)**	**Nickel (Ni)**	**Lead (Pb)**
FE1_05	MAR01229.001	Sediment	8.7	0.08	4.1	5.4	0.02	5.1	3.8
FE2_03	MAR01229.002	Sediment	10.2	0.06	3.1	5.4	0.01	5.5	3.1
FE4_02	MAR01229.003	Sediment	73.3	0.28	23.2	11.4	0.03	58.2	8.8
FE4_05	MAR01229.004	Sediment	40.0	0.50	16.5	6.7	0.02	20.9	6.3
FE7e_02	MAR01229.005	Sediment	13.9	0.13	20.1	13.0	0.04	14.2	13.3
T_TR05_HWB	MAR01229.006	Sediment	4.0	<0.04	2.9	5.8	<0.01	3.8	3.4
T_TR05_MWB	MAR01229.007	Sediment	6.2	0.08	5.4	6.7	0.04	6.4	3.6
T_TR05_LWE	MAR01229.008	Sediment	5.4	<0.04	3.1	6.1	0.02	4.2	6.7
Certified Reference Material SETOC 774 (% Recovery)			98	104	103	99	89	113	92
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.01	<0.5	<0.5

* See Report Notes

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	2	10	1	0.5
		Accreditation	UKAS/MMO	N	N	N
Client Reference:	SOCOTEC Ref:	Matrix	Zinc (Zn)	Aluminium as Al	Barium as Ba	Tin as Sn
FE1_05	MAR01229.001	Sediment	14.0	1400	14.2	<0.5
FE2_03	MAR01229.002	Sediment	11.5	827	14.6	<0.5
FE4_02	MAR01229.003	Sediment	43.8	14800	59.6	0.5
FE4_05	MAR01229.004	Sediment	28.2	9690	107	<0.5
FE7e_02	MAR01229.005	Sediment	55.7	8160	62.5	0.7
T_TR05_HWB	MAR01229.006	Sediment	16.2	834	19.1	<0.5
T_TR05_MWB	MAR01229.007	Sediment	13.1	757	68.3	<0.5
T_TR05_LWE	MAR01229.008	Sediment	12.0	606	55.3	<0.5
Certified Reference Material SETOC 774 (% Recovery)			107	112	102	103
QC Blank			<2	<10	<1	<0.5

* See Report Notes

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	0.001	0.001
		Accreditation	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
FE1_05	MAR01229.001	Sediment	<0.001	<0.001
FE2_03	MAR01229.002	Sediment	<0.001	<0.001
FE4_02	MAR01229.003	Sediment	<0.001	<0.001
FE4_05	MAR01229.004	Sediment	<0.001	<0.001
FE7e_02	MAR01229.005	Sediment	<0.001	<0.001
T_TR05_HWB	MAR01229.006	Sediment	<0.001	<0.001
T_TR05_MWB	MAR01229.007	Sediment	<0.001	<0.001
T_TR05_LWE	MAR01229.008	Sediment	<0.001	<0.001
Certified Reference Material BCR-646 (% Recovery)			74	58
QC Blank			<0.001	<0.001

* See report notes

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
FE1_05	MAR01229.001	Sediment	<1	<1	<1	<1	<1	<1
FE2_03	MAR01229.002	Sediment	<1	<1	<1	<1	<1	<1
FE4_02	MAR01229.003	Sediment	<1	<1	<1	<1	<1	<1
FE4_05	MAR01229.004	Sediment	<1	<1	<1	<1	1.28	1.59
FE7e_02	MAR01229.005	Sediment	2.95	5.24	8.90	23.6	28.3	33.9
T_TR05_HWB	MAR01229.006	Sediment	<1	<1	1.27	5.60	6.29	5.88
T_TR05_MWB	MAR01229.007	Sediment	<1	<1	<1	2.97	3.63	3.11
T_TR05_LWE	MAR01229.008	Sediment	<1	<1	<1	1.67	2.86	2.74
Certified Reference Material Quasimeme QPH097MS (% Recovery)			81	97	86	80	79	76
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.
For full analyte name see method summaries

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	MMO	MMO	MMO
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BEP**	**BKF**	**C1N**	**C1PHEN**	**C2N**
FE1_05	MAR01229.001	Sediment	<1	<1	<1	<1	<1	<1
FE2_03	MAR01229.002	Sediment	<1	<1	<1	<1	<1	<1
FE4_02	MAR01229.003	Sediment	1.31	1.23	<1	2.05	1.47	2.11
FE4_05	MAR01229.004	Sediment	1.69	1.82	1.14	2.83	1.78	3.03
FE7e_02	MAR01229.005	Sediment	31.6	32.4	18.8	53.3	41.9	46.0
T_TR05_HWB	MAR01229.006	Sediment	4.40	5.10	3.85	<1	2.14	1.50
T_TR05_MWB	MAR01229.007	Sediment	2.49	3.08	2.48	<1	1.53	<1
T_TR05_LWE	MAR01229.008	Sediment	2.25	2.64	1.81	<1	<1	1.49
Certified Reference Material Quasimeme QPH097MS (% Recovery)			86	83	102	91	89	108
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.
For full analyte name see method summaries

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	MMO	MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	C3N	CHRYSENE	DBENZAH	FLUORANT	FLUORENE	INDPYR
FE1_05	MAR01229.001	Sediment	<1	<1	<1	<1	<1	<1
FE2_03	MAR01229.002	Sediment	<1	<1	<1	<1	<1	<1
FE4_02	MAR01229.003	Sediment	1.41	<1	<1	1.49	<1	<1
FE4_05	MAR01229.004	Sediment	1.94	1.17	<1	2.11	<1	1.53
FE7e_02	MAR01229.005	Sediment	47.4	27.4	3.56	52.7	6.35	24.8
T_TR05_HWB	MAR01229.006	Sediment	<1	5.90	<1	16.1	<1	4.47
T_TR05_MWB	MAR01229.007	Sediment	<1	3.63	<1	7.91	<1	2.35
T_TR05_LWE	MAR01229.008	Sediment	<1	2.61	<1	3.61	<1	2.13
Certified Reference Material Quasimeme QPH097MS (% Recovery)			81	86	79	76	82	79
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.
For full analyte name see method summaries

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	mg/Kg
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/305
		Limit of Detection	1	1	1	1	1
		Accreditation	UKAS/MMO	MMO	UKAS/MMO	UKAS/MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	NAPTH	PERYLENE	PHENANT	PYRENE	THC
FE1_05	MAR01229.001	Sediment	<1	<1	<1	<1	<1
FE2_03	MAR01229.002	Sediment	<1	<1	<1	<1	<1
FE4_02	MAR01229.003	Sediment	1.07	<1	1.18	1.46	<1
FE4_05	MAR01229.004	Sediment	1.31	<1	1.52	1.95	<1
FE7e_02	MAR01229.005	Sediment	19.3	13.8	45.7	45.2	8.76
T_TR05_HWB	MAR01229.006	Sediment	<1	1.72	6.84	13.2	1.26
T_TR05_MWB	MAR01229.007	Sediment	<1	1.22	4.14	6.59	<1
T_TR05_LWE	MAR01229.008	Sediment	<1	<1	1.21	3.27	3.16
Certified Reference Material Quasimeme QPH097MS (% Recovery)			96	89	80	80	99~
QC Blank			<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.
For full analyte name see method summaries

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB 101**	**PCB 105**	**PCB 110**	**PCB 118**	**PCB 128**	**PCB 138**	**PCB 141**	**PCB 149**
FE1_05	MAR01229.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE2_03	MAR01229.002	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE4_02	MAR01229.003	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE4_05	MAR01229.004	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7e_02	MAR01229.005	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00012	<0.00008	<0.00008
T_TR05_HWB	MAR01229.006	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_MWB	MAR01229.007	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_LWE	MAR01229.008	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			96	79	113	101	109~	11[illegible]	108	98
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 151	PCB 153	PCB 156	PCB 158	PCB 170	PCB 18	PCB 180
FE1_05	MAR01229.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE2_03	MAR01229.002	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE4_02	MAR01229.003	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE4_05	MAR01229.004	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7e_02	MAR01229.005	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_HWB	MAR01229.006	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_MWB	MAR01229.007	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_LWE	MAR01229.008	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			87	98	95	118	75	90	91
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

FUGRO

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

Client Reference:	SOCOTEC Ref:	Units / Method No / Limit of Detection / Accreditation / Matrix	PCB 183	PCB 187	PCB 194	PCB 28	PCB 31	PCB 44	PCB 47
		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
FE1_05	MAR01229.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE2_03	MAR01229.002	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE4_02	MAR01229.003	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE4_05	MAR01229.004	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
FE7e_02	MAR01229.005	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_HWB	MAR01229.006	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_MWB	MAR01229.007	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
T_TR05_LWE	MAR01229.008	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			106~	100	81	74	116	93	107~
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

SOCOTEC

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 49	PCB 52	PCB 66
FE1_05	MAR01229.001	Sediment	<0.00008	<0.00008	<0.00008
FE2_03	MAR01229.002	Sediment	<0.00008	<0.00008	<0.00008
FE4_02	MAR01229.003	Sediment	<0.00008	<0.00008	<0.00008
FE4_05	MAR01229.004	Sediment	<0.00008	<0.00008	<0.00008
FE7e_02	MAR01229.005	Sediment	<0.00008	<0.00008	<0.00008
T_TR05_HWB	MAR01229.006	Sediment	<0.00008	<0.00008	<0.00008
T_TR05_MWB	MAR01229.007	Sediment	<0.00008	<0.00008	<0.00008
T_TR05_LWE	MAR01229.008	Sediment	<0.00008	<0.00008	<0.00008
Certified Reference Material Quasimeme QOR147MS (% Recovery)			107	96	111
QC Blank			<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as
no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

		Units	mg/Kg (Dry Weight)							
		Method No	ASC/SOP/302							
		Limit of Detection	0.0001							
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCB	PPTDE	PPDDE	PPDDT
FE1_05	MAR01229.001	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FE2_03	MAR01229.002	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FE4_02	MAR01229.003	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FE4_05	MAR01229.004	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FE7e_02	MAR01229.005	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
T_TR05_HWB	MAR01229.006	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
T_TR05_MWB	MAR01229.007	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
T_TR05_LWE	MAR01229.008	Sediment	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Certified Reference Material Quasimeme QOR147MS (% Recovery)			123~	99~	122~	108	103	56	83	95~
QC Blank			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.
For full analyte name see method summaries

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID MAR01229
Issue Version 1

Customer Reference 200867 Five Estuaries MMO Analysis - Batch 2

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SOCOTEC Env Chem*	MAR01229.001-008	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ASC/SOP/303/304	MAR01229.004-008	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved in the PAHSED UKAS accredited method. Chrysene and Triphenylene are resolved for MMO but this is currently not UKAS accredited therefore Chrysene is reported without this acccreditation.

DEVIATING SAMPLE STATEMENT

Deviation Code	Deviation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A
D12	Sample integrity compromised or not suitable for analysis	N/A	N/A

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

SOCOTEC

Test Report ID	MAR01229
Issue Version	1
Customer Reference	200867 Five Estuaries MMO Analysis - Batch 2

Method	Sample and Fraction Size	Method Summary
Metals	Air dried	Aqua-regia extraction followed by ICP analysis.
Organotins	Wet Sediment	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment	Solvent extraction and clean up followed by GC-MS analysis.
Total Hydrocarbon Content (THC)	Wet Sediment	Ultra-violet fluorescence spectroscopy
Polychlorinated Biphenyls (PCBs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.
Organochlorine Pesticides (OCPs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.

Analyte Definitions					
Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name
ACENAPTH	Acenaphthene	C2N	C2-naphthalenes	THC	Total Hydrocarbon Content
ACENAPHY	Acenaphthylene	C3N	C3-naphthalenes	AHCH	alpha-Hexachlorocyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorocyclohexane
BAA	Benzo[a]anthracene	DBENZAH	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorocyclohexane
BAP	Benzo[a]pyrene	FLUORANT	Fluoranthene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	FLUORENE	Fluorene	HCB	Hexachlorobenzene
BEP	Benzo[e]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	PPDDE	p,p'-Dichlorodiphenyldichloroethylene
BENZGHIP	Benzo[ghi]perylene	NAPTH	Naphthalene	PPDDT	p,p'-Dichlorodiphenyltrichloroethane
BKF	Benzo[k]fluoranthene	PERYLENE	Perylene	PPTDE	p,p'-Dichlorodiphenyldichloroethane
C1N	C1-naphthalenes	PHENANT	Phenanthrene		
C1PHEN	C1-phenanthrene	PYRENE	Pyrene		

FUGRO

Appendix F

Macrofaunal Analysis

CERTIFICATE OF ANALYSIS

Certificate Number	EP/21/0011a	**FGBML Job Number**	200867
Job Reference	**RWE Five Estuaries – INTERTIDAL CORES**		

Prepared For		**Prepared By**	
Séamus Whyte Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom		Grant Rowe Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom	
Phone	02392 205 561	**Phone**	02392 205 606
Email	s.whyte@fugro.com	**Email**	g.rowe@fugro.com
Web	www.fugro.com	**Web**	www.fugro.com

Sampling Undertaken By	Fugro GB Marine Ltd	**Sampling Date**	26/07/2021
Date of Receipt	21/10/2021	**Date of Analysis**	22/10/2021 – 30/11/21
Sample Matrix	Macrobenthic **ABUNDANCE**		
Method Reference	EUAF-FGBM-BEN-TM-001 Macrobenthic Analysis		
Test Results	Please double click on symbol:		
Laboratory Comments	-		
Deviating Codes	None		
Authorised Signature			
Name	Grant Rowe		
Position	Principal Taxonomist / Benthic QC Manager		
Issue Date	02/12/21		

- Further information on methods of analysis may be obtained from the above address;
- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

Fugro GB Marine Limited. Incorporated in England No. 1135456. Reg. Office: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB

CERTIFICATE OF ANALYSIS

A. DEVIATING SAMPLE - CRITERIA

Code and Criteria	Description	Reporting Comment
DS1 - Damaged container(s)/ packaging	Sample was received in a damaged container which may have resulted in contamination or loss of integrity of the sample.	*Sample was received in a damaged container. The results reported may not be representative of the sample at the time of sampling.*
DS2 - Unsuitable container	Sample was received in an unsuitable container that is known to have an effect on the analysis.	*Sample was received in an unsuitable container. The results reported may not be representative of the sample at the time of sampling.*
DS3 - Incorrect or no sample preservation	Sample was received with no preservative, an incorrect preservative, or in a condition which indicates inappropriate sample storage, where specific criteria are referenced in the method.	*Sample was received in a condition unsuitable for the test. The results reported may not be representative of the sample at the time of sampling.*
DS4 - Missing date/time details	Sample date/time details were not recorded at time of sampling or not provided to the laboratory.	*Sampling date/time was not provided and therefore assessment of sample stability cannot be made. The test results may have been compromised.*
DS5 - Error in sample labelling/details	Sample information is missing, unreadable, conflicting or incorrect. Analysis was undertaken but traceability of results cannot be guaranteed against sample location.	*Incorrect/incomplete sample details have been provided. The traceability of results may have been compromised.*
DS6 - Sample received outside holding time	The date and time information provided with the sample indicate the sample was received at the laboratory outside of the holding time.	*Sample was received outside analysis holding time. The results reported may not be representative of the sample at the time of sampling.*
DS7 - Analysis commenced after holding time	The sample was received at the laboratory within its holding time but an analytical issue led to delay in commencement of analysis which exceeded the holding time.	*The holding time expired prior to analysis being undertaken. The results reported may not be representative of the sample at the time of sampling.*
DS8 - Insufficient analysis material	Insufficient material was received which meant that analysis could not be undertaken, or the analysis could not be carried out in accordance with the method.	*Insufficient sample material was received. The test results may not be representative of the sample at the time of sampling.*
DS9 - Sample contamination	Sample was received in a satisfactory condition but cross-contamination has occurred due to an analytical issue which has resulted in loss of sample integrity.	*The sample integrity may have been compromised due to an analytical issue. The results reported may not be representative of the sample at the time of sampling and are outside the scope of UKAS accreditation.*

Note:
Where it is agreed with the client that a deviating sample should not be tested, then the report should state "Sample not analysed" and the relevant deviating sample code recorded.

- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

Fugro GB Marine Limited. Incorporated in England No. 1135456. Reg. Office: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB

CERTIFICATE OF ANALYSIS

Certificate Number	EP/21/0011b	**FGBML Job Number**	200867
Job Reference	**RWE Five Estuaries – INTERTIDAL CORES**		
Prepared For		**Prepared By**	
Séamus Whyte Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom		Grant Rowe Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom	
Phone	02392 205 561	**Phone**	02392 205 606
Email	s.whyte@fugro.com	**Email**	g.rowe@fugro.com
Web	www.fugro.com	**Web**	www.fugro.com

Sampling Undertaken By	Fugro GB Marine Ltd	**Sampling Date**	26/07/2021
Date of Receipt	21/10/2021	**Date of Analysis**	22/10/2021 – 30/11/21
Sample Matrix	Macrobenthic **BIOMASS**		
Method Reference	EUAF-FGBM-BEN-TM-001 Macrobenthic Analysis		
Test Results	Please double click on symbol:		
Laboratory Comments	-		
Deviating Codes	None		
Authorised Signature			
Name	Grant Rowe		
Position	Principal Taxonomist / Benthic QC Manager		
Issue Date	02/12/21		

- Further information on methods of analysis may be obtained from the above address;
- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

CERTIFICATE OF ANALYSIS

A. DEVIATING SAMPLE - CRITERIA

Code and Criteria	Description	Reporting Comment
DS1 - Damaged container(s)/ packaging	Sample was received in a damaged container which may have resulted in contamination or loss of integrity of the sample.	*Sample was received in a damaged container. The results reported may not be representative of the sample at the time of sampling.*
DS2 - Unsuitable container	Sample was received in an unsuitable container that is known to have an effect on the analysis.	*Sample was received in an unsuitable container. The results reported may not be representative of the sample at the time of sampling.*
DS3 - Incorrect or no sample preservation	Sample was received with no preservative, an incorrect preservative, or in a condition which indicates inappropriate sample storage, where specific criteria are referenced in the method.	*Sample was received in a condition unsuitable for the test. The results reported may not be representative of the sample at the time of sampling.*
DS4 - Missing date/time details	Sample date/time details were not recorded at time of sampling or not provided to the laboratory.	*Sampling date/time was not provided and therefore assessment of sample stability cannot be made. The test results may have been compromised.*
DS5 - Error in sample labelling/details	Sample information is missing, unreadable, conflicting or incorrect. Analysis was undertaken but traceability of results cannot be guaranteed against sample location.	*Incorrect/incomplete sample details have been provided. The traceability of results may have been compromised.*
DS6 - Sample received outside holding time	The date and time information provided with the sample indicate the sample was received at the laboratory outside of the holding time.	*Sample was received outside analysis holding time. The results reported may not be representative of the sample at the time of sampling.*
DS7 - Analysis commenced after holding time	The sample was received at the laboratory within its holding time but an analytical issue led to delay in commencement of analysis which exceeded the holding time.	*The holding time expired prior to analysis being undertaken. The results reported may not be representative of the sample at the time of sampling.*
DS8 - Insufficient analysis material	Insufficient material was received which meant that analysis could not be undertaken, or the analysis could not be carried out in accordance with the method.	*Insufficient sample material was received. The test results may not be representative of the sample at the time of sampling.*
DS9 - Sample contamination	Sample was received in a satisfactory condition but cross-contamination has occurred due to an analytical issue which has resulted in loss of sample integrity.	*The sample integrity may have been compromised due to an analytical issue. The results reported may not be representative of the sample at the time of sampling and are outside the scope of UKAS accreditation.*

Note:
Where it is agreed with the client that a deviating sample should not be tested, then the report should state "Sample not analysed" and the relevant deviating sample code recorded.

- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

Fugro GB Marine Limited. Incorporated in England No. 1135456. Reg. Office: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB

CERTIFICATE OF ANALYSIS

Certificate Number	EP/21/0012a	**FGBML Job Number**	200867
Job Reference	**RWE Five Estuaries – SUBTIDAL GRABS**		
Prepared For		**Prepared By**	
Séamus Whyte Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom		Grant Rowe Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom	
Phone	02392 205 561	**Phone**	02392 205 606
Email	s.whyte@fugro.com	**Email**	g.rowe@fugro.com
Web	www.fugro.com	**Web**	www.fugro.com

Sampling Undertaken By	Fugro GB Marine Ltd	**Sampling Date**	09/11/2021
Date of Receipt	17/11/2021	**Date of Analysis**	23/11/2021 – 11/02/22
Sample Matrix	Macrobenthic **ABUNDANCE**		
Method Reference	EUAF-FGBM-BEN-TM-001 Macrobenthic Analysis		
Test Results	Please double click on symbol:		
Laboratory Comments	-		
Deviating Codes	None		
Authorised Signature			
Name	Grant Rowe		
Position	Principal Taxonomist / Benthic QC Manager		
Issue Date	13/02/22		

- Further information on methods of analysis may be obtained from the above address;
- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

CERTIFICATE OF ANALYSIS

A. DEVIATING SAMPLE - CRITERIA

Code and Criteria	Description	Reporting Comment
DS1 - Damaged container(s)/ packaging	Sample was received in a damaged container which may have resulted in contamination or loss of integrity of the sample.	*Sample was received in a damaged container. The results reported may not be representative of the sample at the time of sampling.*
DS2 - Unsuitable container	Sample was received in an unsuitable container that is known to have an effect on the analysis.	*Sample was received in an unsuitable container. The results reported may not be representative of the sample at the time of sampling.*
DS3 - Incorrect or no sample preservation	Sample was received with no preservative, an incorrect preservative, or in a condition which indicates inappropriate sample storage, where specific criteria are referenced in the method.	*Sample was received in a condition unsuitable for the test. The results reported may not be representative of the sample at the time of sampling.*
DS4 - Missing date/time details	Sample date/time details were not recorded at time of sampling or not provided to the laboratory.	*Sampling date/time was not provided and therefore assessment of sample stability cannot be made. The test results may have been compromised.*
DS5 - Error in sample labelling/details	Sample information is missing, unreadable, conflicting or incorrect. Analysis was undertaken but traceability of results cannot be guaranteed against sample location.	*Incorrect/incomplete sample details have been provided. The traceability of results may have been compromised.*
DS6 - Sample received outside holding time	The date and time information provided with the sample indicate the sample was received at the laboratory outside of the holding time.	*Sample was received outside analysis holding time. The results reported may not be representative of the sample at the time of sampling.*
DS7 - Analysis commenced after holding time	The sample was received at the laboratory within its holding time but an analytical issue led to delay in commencement of analysis which exceeded the holding time.	*The holding time expired prior to analysis being undertaken. The results reported may not be representative of the sample at the time of sampling.*
DS8 - Insufficient analysis material	Insufficient material was received which meant that analysis could not be undertaken, or the analysis could not be carried out in accordance with the method.	*Insufficient sample material was received. The test results may not be representative of the sample at the time of sampling.*
DS9 - Sample contamination	Sample was received in a satisfactory condition but cross-contamination has occurred due to an analytical issue which has resulted in loss of sample integrity.	*The sample integrity may have been compromised due to an analytical issue. The results reported may not be representative of the sample at the time of sampling and are outside the scope of UKAS accreditation.*

Note:
Where it is agreed with the client that a deviating sample should not be tested, then the report should state "Sample not analysed" and the relevant deviating sample code recorded.

- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

Fugro GB Marine Limited. Incorporated in England No. 1135456. Reg. Office: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB

Fugro Document

CERTIFICATE OF ANALYSIS

Certificate Number	EP/21/0012b	**FGBML Job Number**	200867
Job Reference	**RWE Five Estuaries – SUBTIDAL GRABS**		

Prepared For	**Prepared By**
Séamus Whyte Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom	Grant Rowe Fugro GB Marine Limited Trafalgar Wharf (Unit 16) Hamilton Road Portchester Portsmouth PO6 4PX United Kingdom

Phone	02392 205 561	**Phone**	02392 205 606
Email	s.whyte@fugro.com	**Email**	g.rowe@fugro.com
Web	www.fugro.com	**Web**	www.fugro.com

Sampling Undertaken By	Fugro GB Marine Ltd	**Sampling Date**	09/11/2021
Date of Receipt	17/11/2021	**Date of Analysis**	23/11/2021 – 11/02/22
Sample Matrix	Macrobenthic **BIOMASS**		
Method Reference	EUAF-FGBM-BEN-TM-001 Macrobenthic Analysis		
Test Results	Please double click on symbol:		
Laboratory Comments	-		
Deviating Codes	None		
Authorised Signature			
Name	Grant Rowe		
Position	Principal Taxonomist / Benthic QC Manager		
Issue Date	13/02/22		

- Further information on methods of analysis may be obtained from the above address;
- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

Fugro GB Marine Limited. Incorporated in England No. 1135456. Reg. Office: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB

CERTIFICATE OF ANALYSIS

A. DEVIATING SAMPLE - CRITERIA

Code and Criteria	Description	Reporting Comment
DS1 - Damaged container(s)/ packaging	Sample was received in a damaged container which may have resulted in contamination or loss of integrity of the sample.	*Sample was received in a damaged container. The results reported may not be representative of the sample at the time of sampling.*
DS2 - Unsuitable container	Sample was received in an unsuitable container that is known to have an effect on the analysis.	*Sample was received in an unsuitable container. The results reported may not be representative of the sample at the time of sampling.*
DS3 - Incorrect or no sample preservation	Sample was received with no preservative, an incorrect preservative, or in a condition which indicates inappropriate sample storage, where specific criteria are referenced in the method.	*Sample was received in a condition unsuitable for the test. The results reported may not be representative of the sample at the time of sampling.*
DS4 - Missing date/time details	Sample date/time details were not recorded at time of sampling or not provided to the laboratory.	*Sampling date/time was not provided and therefore assessment of sample stability cannot be made. The test results may have been compromised.*
DS5 - Error in sample labelling/details	Sample information is missing, unreadable, conflicting or incorrect. Analysis was undertaken but traceability of results cannot be guaranteed against sample location.	*Incorrect/incomplete sample details have been provided. The traceability of results may have been compromised.*
DS6 - Sample received outside holding time	The date and time information provided with the sample indicate the sample was received at the laboratory outside of the holding time.	*Sample was received outside analysis holding time. The results reported may not be representative of the sample at the time of sampling.*
DS7 - Analysis commenced after holding time	The sample was received at the laboratory within its holding time but an analytical issue led to delay in commencement of analysis which exceeded the holding time.	*The holding time expired prior to analysis being undertaken. The results reported may not be representative of the sample at the time of sampling.*
DS8 - Insufficient analysis material	Insufficient material was received which meant that analysis could not be undertaken, or the analysis could not be carried out in accordance with the method.	*Insufficient sample material was received. The test results may not be representative of the sample at the time of sampling.*
DS9 - Sample contamination	Sample was received in a satisfactory condition but cross-contamination has occurred due to an analytical issue which has resulted in loss of sample integrity.	*The sample integrity may have been compromised due to an analytical issue. The results reported may not be representative of the sample at the time of sampling and are outside the scope of UKAS accreditation.*

Note:
Where it is agreed with the client that a deviating sample should not be tested, then the report should state "Sample not analysed" and the relevant deviating sample code recorded.

- Opinions and interpretations expressed herein are outside the scope of UKAS accreditation;
- Test results reported relate only to those items tested;
- Sub Indicates subcontracted test;
- DS Indicates relevant deviating code applies to test results.

Fugro GB Marine Limited. Incorporated in England No. 1135456. Reg. Office: Fugro House, Hithercroft Road, Wallingford, Oxfordshire, OX10 9RB

F.1 Intertidal Cores Macrofaunal Abundance

			I_TR01_HW	I_TR01_LW	I_TR01_MW	I_TR02_HW	I_TR02_LW	I_TR02_MW	I_TR03_HW	I_TR03_LW	I_TR03_MW	I_TR04_HW	I_TR04_LW	I_TR04_MW	I_TR05_HW	I_TR05_LW	I_TR05_MW	I_TR06_LW	I_TR06_MW	I_TR07_HW	I_TR07_LW	I_TR07_MW	I_TR08_HW	I_TR08_LW	I_TR08_MW
			1095	1097	1096	1098	1100	1099	1101	1103	1102	1104	1106	1105	1107	1109	1108	1111	1110	1112	1114	1113	1115	1117	1116
Taxon	aphiaID	Authority									ABIOTIC														
PLATYHELMINTHES	793	Minot, 1876	-	-	-	-	5	-	4	15	-	-	-	-	7	-	4	2	8	1	-	3	1	2	3
NEMATODA	799	-	1	-	2	5	-	7	-	-	-	-	2	11	1	1	2	1	-	-	-	14	4	4	4
ANNELIDA																									
Streptosyllis websteri	131402	Southern, 1914	-	1	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
Paraonis fulgens	146932	(Levinsen, 1884)	-	3	-	-	-	-	-	-	-	-	4	1	-	3	-	2	1	-	5	-	-	-	-
Malacoceros tetracerus	333954	(Schmarda, 1861)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Spio martinensis	131185	Mesnil, 1896	-	19	-	-	-	-	-	-	-	-	-	-	-	3	-	5	1	-	1	-	-	-	-
Spiophanes bombyx (agg.)	131187	(Claparède, 1870)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Psammodrilus balanoglossoides	130859	Swedmark, 1952	-	4	1	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	2	-	-	1	-
Protodriloides chaetifer	130837	(Remane, 1926)	-	-	-	-	9	-	-	17	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-
Saccocirrus papillocercus	130972	Bobretzky, 1872	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enchytraeidae	2038	d'Udekem, 1855	9	-	-	84	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARTHROPODA																									
ACARI	292684	Leach, 1817	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Urothoe brevicornis	103226	Spence Bate, 1862	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Urothoe elegans	103228	Spence Bate, 1857	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bathyporeia pelagica	103066	(Spence Bate, 1857)	-	1	-	-	-	-	-	-	-	-	4	-	-	1	-	4	-	-	7	-	-	-	-
Eurydice naylori	148650	Jones & Pierpoint, 1997	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1
Tanaissus lilljeborgi	136486	(Stebbing, 1891)	-	-	-	-	-	-	-	-	-	-	16	-	-	5	-	-	1	-	-	-	-	-	-
Cumopsis goodsir	110465	(Van Beneden, 1861)	-	9	-	-	-	-	-	-	-	-	5	1	-	3	-	4	-	-	2	-	-	5	-
COLLEMBOLA	118086	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The following taxa have been removed from the main data matrix prior to analysis

JUVENILES																									
Urothoe	101789	Dana, 1852	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	1	-	-	-	-
Bathyporeia	101742	Lindström, 1855	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
Eurydice	118401	Leach, 1815	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-
Cerastoderma	137735	Poli, 1795	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DAMAGED FAUNA																									
Eurydice	118401	Leach, 1815	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-

F.2 Subtidal Grabs Macrofaunal Abundance

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Cerianthus lloydii	D0632	283798	Gosse, 1859	-	-	-	-	-	-	-	-
ACTINIARIA	D0662	1360	Hertwig, 1882	3	12	4	1	-	-	-	1
Edwardsiidae	D0759	100665	Andres, 1881	-	-	-	-	-	-	-	-
PLATYHELMINTHES	F0001	793	Minot, 1876	-	2	-	2	-	-	-	-
NEMERTEA	G0001	152391	-	1	6	8	1	7	-	2	2
Loxosoma annelidicola	K0006	111811	(Van Beneden & Hesse, 1863)	-	1	-	-	-	-	-	-
Golfingia (Golfingia) elongata	N0014	175026	(Keferstein, 1862)	-	-	-	-	-	-	-	-
Golfingia (Golfingia) vulgaris vulgaris	N0017	410724	(de Blainville, 1827)	-	1	-	-	-	-	-	-
Maxmuelleria lankesteri	O0018	110368	(Herdman, 1897)	-	-	-	-	-	-	-	-
Pisione remota	P0015	130707	(Southern, 1914)	-	-	-	-	-	3	-	-
Subadyte pellucida	P0032	130833	(Ehlers, 1864)	-	-	-	-	-	-	-	-
Gattyana cirrhosa	P0049	130749	(Pallas, 1766)	-	-	-	-	-	-	-	-
Malmgrenia Type A	P0050_G@	147006	McIntosh, 1874	-	-	-	1	-	-	-	-
Malmgrenia bicki	P0050_G@	1044546	Barnich, Dietrich, Hager & Fiege, 2017	-	-	3	-	-	-	-	-
Malmgrenia arenicolae	P0050_G@	152276	(Saint-Joseph, 1888)	-	-	-	-	1	-	-	2
Malmgrenia darbouxi	P0050_G@	863197	(Pettibone, 1993)	-	-	-	-	-	-	-	-
Harmothoe clavigera	P0050_G	130760	(M. Sars, 1863)	-	1	-	-	-	-	-	-
Malmgrenia andreapolis	P0051	147008	McIntosh, 1874	-	-	-	-	-	-	-	-
Harmothoe antilopes	P0052	130754	McIntosh, 1876	-	-	-	-	-	-	-	-
Harmothoe extenuata	P0058	130762	(Grube, 1840)	7	1	1	-	-	-	-	1
Harmothoe impar	P0065	130770	(Johnston, 1839)	-	-	3	-	5	-	-	1
Lepidonotus squamatus	P0082	130801	(Linnaeus, 1758)	4	4	1	1	-	-	-	-
Polynoe scolopendrina	P0084	130830	Savigny, 1822	1	-	-	-	-	-	-	-
Pholoe inornata	P0092	130601	Johnston, 1839	1	3	1	2	1	-	-	3
Pholoe baltica	P0095	130599	Örsted, 1843	-	1	2	-	2	-	-	3
Sthenelais boa	P0107	131074	(Johnston, 1833)	1	-	2	1	-	-	-	-
Eteone longa agg.	P0118	130616	(Fabricius, 1780)	-	-	-	-	-	-	-	-
Hesionura elongata	P0122	130649	(Southern, 1914)	-	-	-	-	-	-	-	-
Mysta barbata	P0126	147027	Malmgren, 1865	-	-	-	-	-	-	-	-
Mysta picta	P0127	147026	(Quatrefages, 1866)	-	-	-	1	-	-	-	-
Phyllodoce groenlandica	P0141	334506	Örsted, 1842	-	-	-	-	-	-	-	-
Phyllodoce lineata	P0142	334508	(Claparède, 1870)	-	-	-	-	-	-	-	-
Phyllodoce longipes	P0143	130673	Kinberg, 1866	-	-	-	-	-	-	-	-
Eulalia expusilla	P0153	130625	Pleijel, 1987	-	-	-	-	-	-	-	-
Eulalia mustela	P0155	130631	Pleijel, 1987	-	-	-	-	-	-	-	-
Eulalia ornata	P0156	130632	Saint-Joseph, 1888	-	-	-	-	-	-	-	-
Eumida bahusiensis	P0164	130641	Bergstrom, 1914	-	-	-	-	-	-	-	-
Eumida sanguinea agg.	P0167	130644	(Örsted, 1843)	1	-	-	2	1	-	-	2
Glycera alba	P0256	130116	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Glycera lapidum	P0260	130123	Quatrefages, 1866	-	3	1	1	-	1	-	4
Glycera oxycephala	P0262	130126	Ehlers, 1887	-	-	-	-	-	-	-	-
Glycinde nordmanni	P0268	130136	(Malmgren, 1866)	-	-	-	-	-	-	-	2
Goniada maculata	P0271	130140	Örsted, 1843	-	-	-	-	-	-	-	-
Sphaerodorum gracilis	P0291	131100	(Rathke, 1843)	-	-	-	1	-	-	-	-
Podarkeopsis capensis	P0319	130195	(Day, 1963)	-	-	-	-	-	-	-	-
Syllidia armata	P0321	130198	Quatrefages, 1866	-	1	-	-	-	-	-	-
Syllis garciai	P0351	131431	(Campoy, 1982)	-	-	2	2	-	-	2	1
Syllis pontxioi	P0358_A	196003	San Martín & López, 2000	-	-	-	-	-	-	-	-
Syllis armillaris	P0365	131415	(O.F. Müller, 1776)	8	1	3	1	-	-	-	-
Syllis cf. *armillaris*	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Syllis variegata	P0371	131458	Grube, 1860	10	2	-	-	-	-	-	-
Amblyosyllis spectabilis	P0374_A	1258721	(Johnston in Baird, 1861)	1	-	-	-	-	-	-	-
Eusyllis blomstrandi	P0380	131290	Malmgren, 1867	-	-	-	-	2	-	-	2
Odontosyllis fulgurans	P0387	131327	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-	-
Streptodonta pterochaeta	P0391	238207	(Southern, 1914)	-	-	-	-	-	-	-	-
Streptosyllis campoyi	P0402_G	238248	Brito, Núñez & San Martín, 2000	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Exogone verugera	P0423	333456	(Claparède, 1868)	-	-	-	-	-	-	-	-
Erinaceusyllis erinaceus	P0426	195953	(Claparède, 1863)	-	-	-	-	-	-	-	-
Sphaerosyllis taylori	P0430	131394	Perkins, 1981	-	-	-	-	-	-	-	-
Myrianida	P0449	129659	Milne Edwards, 1845	-	-	-	-	-	-	-	-
Proceraea aurantiaca	P0451_G	131361	Claparède, 1868	3	-	-	-	-	-	-	-
Rullierinereis ancornunezi	P0458_A	492034	Núñez & Brito, 2006	-	-	-	-	-	-	-	-
Eunereis longissima	P0475	130375	(Johnston, 1840)	-	-	-	-	-	-	-	1
Nephtys caeca	P0496	130355	(Fabricius, 1780)	-	-	-	1	-	-	-	-
Nephtys cirrosa	P0498	130357	Ehlers, 1868	-	-	-	-	-	-	2	-
Nephtys hombergii	P0499	130359	Savigny in Lamarck, 1818	-	-	-	-	-	-	-	-
Nephtys kersivalensis	P0502	130363	McIntosh, 1908	-	-	5	-	-	-	-	1
Nephtys longosetosa	P0503	130364	Örsted, 1842	-	-	-	-	-	-	-	-
Lysidice ninetta	P0562	130071	Audouin & H Milne Edwards, 1833	-	-	-	1	-	-	-	-
Paucibranchia totospinata	P0563_B	1305625	(Lu & Fauchald, 1998)	-	-	-	-	1	-	-	1
Paucibranchia bellii	P0564	1297885	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-	-
Marphysa sanguinea	P0566	130075	(Montagu, 1813)	1	-	1	-	-	-	-	-
Lysidice unicornis	P0568	742232	(Grube, 1840)	-	-	1	-	1	-	-	2
Hilbigneris pleijeli	P0569_F	396540	Carrera-Parra, 2006	-	1	-	-	-	-	-	-
Lumbrineris cf. *cingulata*	P0572_A	130240	Ehlers, 1897	-	31	24	8	4	-	-	17
Drilonereis	P0589	129200	Claparède, 1870	-	1	-	-	-	-	-	-
Protodorvillea kefersteini	P0638	130041	(McIntosh, 1869)	-	-	-	-	-	1	-	-
Schistomeringos neglecta	P0642	130044	(Fauvel, 1923)	-	-	-	-	-	1	-	-
Schistomeringos rudolphi	P0643	154127	(Delle Chiaje, 1828)	-	1	3	-	-	-	1	2
Orbinia sertulata	P0665	130523	(Savigny, 1822)	-	-	1	-	-	-	-	-
Scoloplos armiger	P0672	130537	(Müller, 1776)	-	-	-	-	-	-	-	-
Paradoneis lyra	P0699	130585	(Southern, 1914)	-	1	1	1	-	-	-	-
Poecilochaetus serpens	P0718	130711	Allen, 1904	-	-	-	-	-	-	-	-
Aonides oxycephala	P0722	131106	(Sars, 1862)	-	2	6	-	-	-	-	1
Aonides paucibranchiata	P0723	131107	Southern, 1914	-	1	-	-	1	1	-	1
Atherospio guillei	P0724_A	478336	(Laubier & Ramos, 1974)	-	-	-	-	-	-	-	1
Laonice irinae	P0731_G	1518242	Sikorski, Radashevsky & Nygren in Sikorski et al, 2021	-	-	-	-	-	-	-	1
Dipolydora Species A	P0748_A	129611	Verrill, 1881	3	-	-	-	-	-	-	1
Dipolydora Type N	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-	-
Polydora ciliata Type A	P0752	131141	(Johnston, 1838)	-	-	-	-	-	-	-	-
Dipolydora flava	P0754	131118	(Claparède, 1870)	15	1	4	2	1	-	-	-
Dipolydora saintjosephi	P0761	131123	(Eliason, 1920)	7	-	1	-	1	-	-	-
Pseudopolydora pulchra	P0774	131169	(Carazzi, 1893)	-	-	-	-	-	-	-	-
Pygospio elegans	P0776	131170	Claparède, 1863	-	-	-	-	-	-	-	-
Scolelepis korsuni	P0777_A	131174	Sikorski, 1994	-	-	-	-	-	-	-	-
Spio	P0787	129625	Fabricius, 1785	-	-	-	-	-	-	-	-
Spiophanes bombyx agg.	P0794	131187	(Claparède, 1870)	-	-	-	-	-	-	-	-
Magelona johnstoni	P0803_A	130269	Fiege, Licher & Mackie, 2000	-	-	-	-	-	-	-	-
Magelona alleni	P0804	130266	Wilson, 1958	-	-	-	-	-	-	-	-
Chaetopterus	P0811	129229	Cuvier, 1830	-	-	-	-	-	-	-	-
Aphelochaeta Type A	P0823	129240	Blake, 1991	-	-	-	-	-	-	-	-
Aphelochaeta marioni	P0824	129938	(Saint-Joseph, 1894)	-	-	-	-	-	-	-	-
Caulleriella alata	P0829	129943	(Southern, 1914)	2	-	7	2	2	-	-	6
Chaetozone zetlandica	P0831	336485	McIntosh, 1911	1	1	-	1	-	-	-	-
Dodecaceria	P0840	129246	Örsted, 1843	-	1	1	-	-	-	-	-
Flabelligera affinis	P0881	130103	M. Sars, 1829	-	2	-	3	3	-	-	-
Pherusa plumosa	P0885	130113	(Müller, 1776)	-	-	-	-	-	-	-	-
Mediomastus fragilis	P0919	129892	Rasmussen, 1973	-	-	2	-	1	-	-	-
Notomastus	P0920	129220	M. Sars, 1851	-	5	3	1	1	1	-	1
Leiochone	**P0951_F**	146991	Grube, 1868	-	9	-	-	-	-	-	1
Euclymene oerstedii	P0964	130294	(Claparède, 1863)	-	-	-	-	-	-	-	-
Praxillella affinis	P0971	130322	(M. Sars in G.O. Sars, 1872)	-	2	2	-	1	-	-	-
Micromaldane ornithochaeta	P0978	130310	Mesnil, 1897	7	-	-	-	-	-	-	-
Nicomache	P0979	129357	Malmgren, 1865	-	-	-	-	-	-	-	-
Petaloproctus	P0985	129359	Quatrefages, 1866	-	4	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Ophelia borealis	P0999	130491	Quatrefages, 1866	-	-	-	-	-	-	1	-
Travisia forbesii	P1007	130512	Johnston, 1840	-	-	-	-	-	-	-	-
Asclerocheilus intermedius	P1022	130974	(Saint-Joseph, 1894)	3	6	-	-	-	-	-	-
Scalibregma celticum	P1026	130979	Mackie, 1991	-	2	4	1	-	-	-	1
Scalibregma inflatum	P1027	130980	Rathke, 1843	-	2	-	4	4	-	1	15
Sclerocheilus minutus	P1029	130982	Grube, 1863	-	1	-	-	-	-	-	-
Polygordius	P1062	129472	Schneider, 1868	-	-	-	-	-	4	-	-
Galathowenia oculata	P1093	146950	(Zachs, 1923)	-	-	-	-	-	-	-	-
Owenia borealis	P1097_G	329882	Koh, Bhaud & Jirkov, 2003	-	-	-	-	-	-	-	-
Lagis koreni	P1107	152367	Malmgren, 1866	-	-	-	-	-	-	-	-
Sabellaria spinulosa	P1117	130867	(Leuckart, 1849)	21	2	155	3	-	-	2	1
Melinna palmata	P1124	129808	Grube, 1870	-	-	-	-	-	-	-	-
Ampharete lindstroemi	P1139	129781	Malmgren, 1867 sensu Hessle, 1917	1	2	-	-	-	-	-	1
Amphicteis midas	P1143	129785	(Gosse, 1855)	1	-	3	-	-	-	-	-
Terebellides	P1174	129717	Sars, 1835	-	-	-	-	-	-	-	1
Loimia ramzega	P1200_G	1036014	Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017	-	-	3	-	1	-	-	4
Nicolea venustula	P1210	131507	(Montagu, 1819)	1	-	-	-	1	-	-	-
Amaeana trilobata	P1229	131471	(Sars, 1863)	-	-	-	-	-	-	-	-
Lysilla loveni	P1233	131500	Malmgren, 1866	-	-	-	-	-	-	-	-
Lysilla nivea	P1234	131501	Langerhans, 1884	-	-	-	-	-	-	-	-
Polycirrus	P1235	129710	Grube, 1850	2	-	1	-	-	-	-	-
Thelepus parapari	P1253_G	1253692	Jirkov, 2018	3	-	-	-	-	-	-	3
Thelepus setosus	P1255	131544	(Quatrefages, 1866)	4	1	3	-	-	-	-	-
Jasmineira elegans	P1290	130921	Saint-Joseph, 1894	5	-	-	-	-	-	-	-
Perkinsiana rubra	P1307	130948	(Langerhans, 1880)	5	-	-	-	-	-	-	-
Pseudopotamilla	P1315	129548	Bush, 1905	6	1	1	-	-	-	-	-
Sabella discifera	P1318	130964	Grube, 1874	-	-	-	-	-	-	-	-
Sabella pavonina	P1320	130967	Savigny, 1822	-	-	-	-	-	-	-	-
Spirobranchus lamarcki	P1340	560033	(Quatrefages, 1866)	2	3	3	13	14	-	-	3
Spirobranchus triqueter	P1341	555935	(Linnaeus, 1758)	-	3	1	-	-	-	-	-
Tubificoides	P1487	137393	Lastočkin, 1937	-	-	-	-	-	-	-	-
Grania	P1524	137349	Southern, 1913	-	-	-	-	-	-	-	-
Nymphon brevirostre	Q0005	150520	Hodge, 1863	-	-	-	-	-	-	-	-
Achelia echinata	Q0015	134599	Hodge, 1864	3	-	-	-	-	-	-	-
Ammothella longipes	Q0018	134614	(Hodge, 1864)	-	-	-	-	-	-	-	-
Callipallene	**Q0032**	134581	Flynn, 1929	4	-	-	-	-	-	-	-
Anoplodactylus petiolatus	Q0044	134723	(Krøyer, 1844)	-	-	-	-	-	-	-	-
Verruca stroemia	R0041	106257	(O.F. Müller, 1776)	94	28	332	60	37	-	-	1
Balanus crenatus	R0077	106215	Bruguière, 1789	-	-	16	-	-	-	-	-
OSTRACODA	R2412	1078	Latreille, 1802	-	-	-	-	-	-	-	-
Rissoides desmaresti	S0018	136135	(Risso, 1816)	-	-	-	-	-	-	-	-
Gastrosaccus spinifer	S0044	120020	(Goës, 1864)	-	-	-	-	-	-	-	-
Heteromysis (Heteromysis) microps	S0093	120037	(G.O. Sars, 1877)	-	-	-	1	-	-	-	1
Apherusa ovalipes	S0107	102172	Norman & Scott, 1906	-	-	-	-	-	-	-	-
Apolochus neapolitanus	S0159	236495	(Della Valle, 1893)	-	-	-	-	-	-	-	-
Leucothoe procera	S0179	102466	Spence Bate, 1857	-	-	-	-	-	-	-	-
Stenothoe marina	S0213	103166	(Spence Bate, 1857)	-	-	3	-	-	-	-	1
Urothoe brevicornis	S0247	103226	Spence Bate, 1862	-	-	-	-	-	-	-	-
Urothoe elegans	S0248	103228	Spence Bate, 1857	-	1	-	-	-	-	-	-
Urothoe marina	S0249	103233	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Harpinia pectinata	S0257	102972	Sars, 1891	-	-	-	-	-	-	-	-
Acidostoma neglectum	S0272_A	102495	Dahl, 1964	-	-	-	-	-	-	-	-
Lysianassa ceratina	S0303	102605	(Walker, 1889)	1	-	-	-	-	-	-	-
Iphimedia minuta	S0380	102345	G.O. Sars, 1883	3	-	-	-	-	-	-	-
Iphimedia nexa	S0381	102346	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	4	-	-	-	-	-
Iphimedia spatula	S0384	102351	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	2	-	1	-	-	-
Nototropis guttatus	S0411	488957	Costa, 1853	-	-	-	-	-	-	-	-
Ampelisca diadema	S0429	101896	(Costa, 1853)	6	6	-	6	-	-	-	-
Ampelisca spinipes	S0438	101928	Boeck, 1861	-	2	16	-	-	-	-	9

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Haploops	S0446	101447	Liljeborg, 1856	-	-	-	-	-	-	-	-
Bathyporeia elegans	S0452	103058	Watkin, 1938	-	-	-	-	-	-	-	-
Bathyporeia guilliamsoniana	S0454	103060	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Bathyporeia pelagica	S0456	103066	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Abludomelita obtusata	S0498	102788	(Montagu, 1813)	-	-	-	-	-	-	-	1
Cheirocratus (female)	S0503	101669	Norman, 1867	-	-	1	-	-	-	-	1
Othomaera othonis	S0519	534781	(H. Milne Edwards, 1830)	-	-	-	-	-	-	-	-
Maerella tenuimana	S0521	102831	(Spence Bate, 1862)	-	-	-	-	-	-	-	-
Megamphopus cornutus	S0539	102377	Norman, 1869	-	-	-	-	-	-	-	1
Gammaropsis maculata	S0541	102364	(Johnston, 1828)	2	2	2	-	-	-	-	1
Photis longicaudata	S0552	102383	(Spence Bate & Westwood, 1862)	-	-	-	-	-	-	-	-
Ericthonius	**S0561**	101567	H. Milne Edwards, 1830	10	2	3	2	-	-	-	2
Jassa	S0568	101571	Leach, 1814	-	-	-	-	-	-	-	-
Microjassa cumbrensis	S0574	102439	(Stebbing & Robertson, 1891)	-	1	-	-	-	-	-	-
Aoridae	**S0577**	101368	Stebbing, 1899	-	-	-	-	-	-	-	1
Crassicorophium crassicorne	S0611	397383	(Bruzelius, 1859)	-	-	-	-	-	-	-	-
Monocorophium sextonae	S0615	148603	(Crawford, 1937)	-	6	10	4	16	-	-	12
Unciola crenatipalma	S0621	102057	(Spence Bate, 1862)	1	-	-	-	-	-	-	-
Dyopedos monacanthus	S0628	489646	(Metzger, 1875)	-	-	-	-	-	-	-	-
Pariambus typicus	S0651	101857	(Krøyer, 1845)	-	-	-	-	-	-	-	-
Phtisica marina	S0657	101864	Slabber, 1769	1	-	13	3	-	-	-	-
Pseudoprotella phasma	S0659	101871	(Montagu, 1804)	1	3	13	-	-	-	-	2
Gnathia oxyuraea	S0796	118995	(Lilljeborg, 1855)	-	-	-	-	-	-	-	-
Anthura gracilis	S0803	118467	(Montagu, 1808)	-	-	-	1	1	-	-	-
Eurydice spinigera	S0855	148637	Hansen, 1890	-	-	-	-	-	-	-	-
Cleantis prismatica	S0947	119038	(Risso, 1826)	-	-	-	-	-	-	-	-
Astacilla longicornis	S0955	119024	(Sowerby, 1806)	-	-	-	-	-	-	-	-
Apseudes talpa	S1177	136285	(Montagu, 1808)	5	5	-	8	5	-	-	-
Bodotria scorpioides	S1197	110445	(Montagu, 1804)	-	-	-	-	-	-	-	1
Diastylis bradyi	S1248	110472	Norman, 1879	-	-	-	-	-	-	-	-
Diastylis rathkei	S1253	110487	(Krøyer, 1841)	-	-	-	-	-	-	-	-
Eualus cranchii	S1360	156083	(Leach, 1817 [in Leach, 1815-1875])	2	-	-	-	-	-	-	-
Axius stirhynchus	S1407	107722	Leach, 1816	-	-	-	-	-	-	-	-
Callianassa subterranea	S1415	107729	(Montagu, 1808)	-	-	-	-	-	-	1	-
Upogebia deltaura	S1419	107739	(Leach, 1816)	1	1	-	1	-	-	-	1
Anapagurus hyndmanni	S1448	107217	(Bell, 1845 [in Bell, 1844-1853])	-	1	1	1	1	-	-	-
Galathea intermedia	S1472	107150	Lilljeborg, 1851	-	2	2	-	-	-	-	1
Pisidia longicornis	S1482	107188	(Linnaeus, 1767)	39	18	78	316	229	1	-	-
Ebalia tuberosa	S1508	107301	(Pennant, 1777)	-	1	-	-	-	-	-	-
Ebalia tumefacta	S1509	107302	(Montagu, 1808)	-	-	1	-	-	-	-	-
Hyas coarctatus	S1519	107323	Leach, 1815 [in Leach, 1815-1875]	-	-	-	-	-	-	-	1
Macropodia rostrata	S1532	107345	(Linnaeus, 1761)	-	-	-	-	-	-	-	-
Atelecyclus rotundatus	S1555	107273	(Olivi, 1792)	-	-	-	-	2	-	-	-
Thia scutellata	S1559	107281	(Fabricius, 1793)	-	-	-	-	-	-	-	-
Pilumnus hirtellus	S1615	107418	(Linnaeus, 1761)	6	1	1	2	-	-	-	2
Leptochiton asellus	W0053	140199	(Gmelin, 1791)	-	6	-	2	-	-	-	2
Puncturella noachina	W0112	139975	(Linnaeus, 1771)	1	-	-	-	-	-	-	-
Steromphala tumida	W0161	1477356	(Montagu, 1803)	-	-	-	-	-	-	-	-
Steromphala cineraria	W0163	1039839	(Linnaeus, 1758)	-	-	-	1	-	-	-	-
Calliostoma zizyphinum	W0182	141767	(Linnaeus, 1758)	-	1	-	-	-	-	-	-
Crisilla semistriata	W0348	141280	(Montagu, 1808)	2	-	-	-	-	-	-	-
Caecum glabrum	W0418	138952	(Montagu, 1803)	-	-	-	-	-	1	-	-
Crepidula fornicata	W0439	138963	(Linnaeus, 1758)	-	-	3	-	-	-	-	2
Euspira nitida	W0491	151894	(Donovan, 1803)	-	-	-	-	-	-	-	-
Epitonium clathratulum	W0556	139718	(Kanmacher, 1798)	-	-	1	-	-	-	-	-
Ocenebra erinaceus	W0685	140405	(Linnaeus, 1758)	-	-	1	-	-	-	-	-
Buccinum undatum	W0708	138878	Linnaeus, 1758	-	-	-	-	-	-	-	-
Brachystomia eulimoides	W0922	491650	(Hanley, 1844)	-	-	-	-	-	-	-	-
Philine quadripartita	W1038_A	574582	Ascanius, 1772	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Duvaucelia	W1245_F	536858	Risso, 1826	-	1	-	-	2	-	-	-
Doto	W1270	137916	Oken, 1815	-	-	4	-	-	-	-	-
Acanthodoris pilosa	W1333	140627	(Abildgaard [in Müller], 1789)	-	-	-	-	-	-	-	-
Nucula hanleyi	W1568	140588	Winckworth, 1931	-	-	-	1	2	-	-	-
Nucula nitidosa	W1569	140589	Winckworth, 1930	-	-	-	-	-	-	-	-
Nucula nucleus	W1570	140590	(Linnaeus, 1758)	3	-	1	3	-	-	-	-
Striarca lactea	W1676	140571	(Linnaeus, 1758)	-	1	-	-	-	-	-	-
Glycymeris glycymeris	W1688	140025	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Mytilus edulis	W1695	140480	Linnaeus, 1758	-	-	-	-	-	-	-	-
Modiolus adriaticus	W1700	140462	Lamarck, 1819	-	-	-	-	-	-	-	-
Modiolus barbatus	W1701	140464	(Linnaeus, 1758)	-	1	-	-	-	-	-	-
Modiolula phaseolina	W1708	140461	(Philippi, 1844)	-	-	-	-	-	-	-	-
Musculus discors	W1721	140472	(Linnaeus, 1767)	-	-	3	-	-	-	-	-
Aequipecten opercularis	W1773	140687	(Linnaeus, 1758)	2	-	-	1	-	-	-	1
Heteranomia squamula	W1809	138749	(Linnaeus, 1758)	4	-	-	-	-	-	-	-
Diplodonta rotundata	W1864	141883	(Montagu, 1803)	-	1	-	1	-	-	-	-
Kellia suborbicularis	W1875	140161	(Montagu, 1803)	-	-	-	-	-	-	-	-
Tellimya ferruginosa	W1902	146952	(Montagu, 1808)	-	-	-	-	-	-	-	-
Kurtiella bidentata	W1906	345281	(Montagu, 1803)	-	-	-	-	-	-	-	-
Epilepton clarkiae	W1911	140366	(W. Clark, 1852)	-	-	-	-	-	-	-	-
Goodallia triangularis	W1929	138831	(Montagu, 1803)	-	-	-	-	-	-	-	-
Spisula elliptica	W1975	140300	(T. Brown, 1827)	-	-	-	-	-	-	-	-
Phaxas pellucidus	W2006	140737	(Pennant, 1777)	-	-	-	-	-	-	-	-
Moerella donacina	W2021	147021	(Linnaeus, 1758)	-	1	-	-	-	-	-	1
Asbjornsenia pygmaea	W2023	879714	(Lovén, 1846)	-	-	-	-	-	-	-	-
Abra alba	W2059	141433	(W. Wood, 1802)	3	1	-	2	-	-	-	-
Abra prismatica	W2062	141436	(Montagu, 1808)	-	-	-	-	-	-	-	-
Clausinella fasciata	W2100	141909	(da Costa, 1778)	-	-	-	-	-	-	-	-
Timoclea ovata	W2104	141929	(Pennant, 1777)	-	-	-	2	-	-	-	-
Polititapes rhomboides	W2113	745846	(Pennant, 1777)	-	1	-	-	-	-	-	-
Mya truncata	W2147	140431	Linnaeus, 1758	-	-	-	-	-	-	-	-
Sphenia binghami	W2152	140432	W. Turton, 1822	14	2	6	-	-	-	-	-
Varicorbula gibba	W2157	378492	(Olivi, 1792)	-	-	-	-	-	-	-	-
Rocellaria dubia	W2162	505249	(Pennant, 1777)	24	-	-	-	-	-	-	-
Hiatella	W2165	138068	Bosc, 1801	6	-	-	-	-	-	-	-
Saxicavella jeffreysi	W2172	140108	Winckworth, 1930	-	-	-	-	-	-	-	-
Barnea parva	W2183	140768	(Pennant, 1777)	1	-	-	-	-	-	-	-
Thracia villosiuscula	W2233	141651	(MacGillivray, 1827)	-	-	-	-	-	-	-	-
Thracia distorta	W2235	141647	(Montagu, 1803)	2	2	-	-	-	-	-	-
Phoronis	ZA0003	128545	Wright, 1856	1	19	2	12	2	-	-	5
Ophiothrix fragilis	ZB0124	125131	(Abildgaard in O.F. Müller, 1789)	-	-	-	-	-	-	-	-
Acrocnida brachiata	ZB0151	236130	(Montagu, 1804)	-	-	-	-	-	-	-	-
Amphiura filiformis	ZB0154	125080	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Amphipholis squamata	ZB0161	125064	(Delle Chiaje, 1828)	3	9	10	14	13	-	-	-
Ophiocten affinis	ZB0167	124850	(Lütken, 1858)	-	-	-	-	-	-	1	-
Ophiura albida	ZB0168	124913	Forbes, 1839	-	-	-	-	-	-	-	3
Ophiura ophiura	ZB0170	124929	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Psammechinus miliaris	ZB0193	124319	(P.L.S. Müller, 1771)	-	2	-	2	1	-	-	1
Echinocyamus pusillus	ZB0212	124273	(O.F. Müller, 1776)	-	5	-	-	1	-	3	-
Echinocardium cordatum	ZB0223	124392	(Pennant, 1777)	-	-	-	-	-	-	-	-
ENTEROPNEUSTA	ZC0012	1820	Gegenbaur, 1870	-	-	-	-	-	-	-	-
ASCIDIACEA	ZD0002	1839	Blainville, 1824	1	11	16	4	-	-	-	3
			Number of taxa:	288	288	288	288	288	288	288	288
			Abundance:	377	269	812	508	369	14	16	147

The following taxa (highlighted below) are merged in rationalised dataset above

Leiochone	P0951_F	146991	Grube, 1868	-	3	-	-	-	-	-	1
Leiochone tricirrata	P0951_F	328694	Bellan & Reys, 1967	-	6	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Leiochone johnstoni	P0958	221095	McIntosh, 1915	-	-	-	-	-	-	-	-
Leiochone	P0951_F	146991	Grube, 1868	-	9	-	-	-	-	-	1
Callipallene	Q0032	134581	Flynn, 1929	4	-	-	-	-	-	-	-
Callipallene tiberii	Q0038	134648	(Dohrn, 1881)	-	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	4	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	6	1	2	1	-	-	-	1
Ericthonius punctatus	S0564	102408	(Spence Bate, 1857)	4	1	1	1	-	-	-	1
Ericthonius	S0561	101567	H. Milne Edwards, 1830	10	2	3	2	-	-	-	2
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-	-	-
Leptocheirus hirsutimanus	S0588	102036	(Spence Bate, 1862)	-	-	-	-	-	-	-	1
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-	-	1
PRESENCE/ABSENCE DATA											
Folliculinidae	A0003	1692	Dons, 1914	-	P	P	-	-	-	P	-
PORIFERA	C0001	558	Grant, 1836	P	P	-	P	P	-	-	P
Cliona agg.	C0475	132026	Grant, 1826	-	-	-	-	-	-	-	-
Raspailiidae	C1258	131642	Nardo, 1833	-	P	-	-	-	-	-	-
Haleciidae	D0389	1608	Hincks, 1868	P	-	P	-	-	-	-	-
Halecium	D0390	117103	Oken, 1815	P	-	-	-	-	-	-	-
Sertulariidae	D0407	1614	Lamouroux, 1812	-	P	P	P	-	-	-	P
Hydrallmania falcata	D0424	117890	(Linnaeus, 1758)	P	P	-	-	-	-	-	-
Sertularella	D0427	117233	Gray, 1848	P	-	-	-	-	-	-	-
Sertularia	D0433	117234	Linnaeus, 1758	-	-	-	-	-	-	-	-
Plumulariidae	D0447	1613	McCrady, 1859	-	-	P	-	-	-	-	-
Nemertesia	D0462	117195	Lamouroux, 1812	-	-	P	-	-	-	-	-
Plumularia setacea	D0469	117824	(Linnaeus, 1758)	P	-	-	-	-	-	-	-
Campanulariidae	D0491	1606	Johnston, 1836	-	P	-	-	-	-	-	-
Clytia	D0501	117030	Lamouroux, 1812	P	P	-	P	-	-	-	P
Clytia hemisphaerica	D0503	117368	(Linnaeus, 1767)	-	-	-	P	-	-	-	-
Alcyonium digitatum	D0597	125333	Linnaeus, 1758	-	P	-	P	P	-	-	P
Epizoanthus	D0648	100790	Gray, 1867	-	P	-	-	-	-	-	-
Crisia aculeata	Y0014	111690	Hassall, 1841	P	-	P	-	-	-	-	-
Oncousoecia dilatans	Y0025	111745	(Johnston, 1847)	-	-	-	P	P	-	-	-
Tubuliporidae	Y0026	110814	Johnston, 1837	-	P	P	P	P	-	-	-
Plagioecia patina	Y0041	111719	(Lamarck, 1816)	P	P	-	P	-	-	-	-
Disporella hispida	Y0066	111730	(Fleming, 1828)	-	P	-	P	P	P	-	P
Alcyonidiidae	Y0072	110783	Johnston, 1837	-	-	P	P	-	-	-	-
Alcyonidium	Y0073	110993	J.V.F.Lamouroux, 1813	P	-	-	-	-	-	-	-
Alcyonidium diaphanum	Y0076	111597	(Hudson, 1778)	-	-	-	-	-	-	-	-
Nolella dilatata	Y0092	111632	(Hincks, 1860)	P	-	P	-	-	-	-	-
Vesicularia spinosa	Y0131	111669	(Linnaeus, 1758)	-	-	-	-	-	-	P	P
Amathia lendigera	Y0135	111659	(Linnaeus, 1758)	P	-	-	-	-	-	-	-
Scruparia ambigua	Y0161	111539	(d'Orbigny, 1841)	P	-	-	-	-	-	-	-
Conopeum reticulum	Y0172	111351	(Linnaeus, 1767)	P	-	P	-	-	-	P	-
Electra monostachys	Y0177	111354	(Busk, 1854)	-	-	-	-	-	-	-	-
Electra pilosa	Y0178	111355	(Linnaeus, 1767)	P	-	-	-	-	-	-	P
Aspidelectra melolontha	Y0182	111350	(Landsborough, 1852)	-	-	P	-	-	-	P	-
Chartella papyracea	Y0192	111365	(Ellis & Solander, 1786)	P	-	-	-	-	-	-	-
Hincksina flustroides	Y0196	111369	(Hincks, 1877)	-	P	P	P	-	-	-	-
Amphiblestrum auritum	Y0222	111186	(Hincks, 1877)	-	-	-	-	-	-	-	-
Crisularia plumosa	Y0246	834039	(Pallas, 1766)	P	-	-	-	-	-	-	-
Bicellariella ciliata	Y0256	111147	(Linnaeus, 1758)	-	-	P	-	-	-	-	P
Puellina	Y0315	110897	Jullien, 1886	-	-	-	-	-	-	-	-
Hippothoa divaricata	Y0332	111399	Lamouroux, 1821	-	-	-	P	-	-	-	-
Chorizopora brongniartii	Y0344	111304	(Audouin, 1826)	-	P	P	P	P	-	-	-
Escharella immersa	Y0364	111484	(Fleming, 1828)	P	P	P	P	P	-	-	P
Escharella variolosa	Y0369	111495	(Johnston, 1838)	-	P	-	P	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
Escharella ventricosa	Y0370	111496	(Hassall, 1842)	-	P	-	-	-	-	-	-
Neolagenipora collaris	Y0376	111509	(Norman, 1867)	-	-	-	-	-	-	-	-
Porella concinna	Y0385	111125	(Busk, 1854)	-	P	-	P	-	-	-	-
Reptadeonella violacea	Y0401	111061	(Johnston, 1847)	-	P	P	P	P	-	-	-
Schizoporella hesperia	Y0427	111528	Hayward & Ryland, 1995	-	-	-	P	P	-	-	-
Escharina johnstoni	Y0440	111518	(Quelch, 1884)	-	-	-	-	-	-	-	-
Schizomavella	Y0467	110829	Canu & Bassler, 1917	-	P	P	-	-	-	-	P
Schizomavella (Schizomavella) linearis	Y0474	862795	(Hassall, 1841)	P	-	-	P	-	-	-	-
Microporella ciliata	Y0480	111421	(Pallas, 1766)	P	-	-	-	P	-	-	-
Fenestrulina	Y0482	110941	Jullien, 1888	-	-	P	-	-	-	-	-
Hagiosynodos latus	Y0520	111391	(Busk, 1856)	-	P	-	P	P	-	-	-
Didemnidae	ZD0041	103439	Giard, 1872	-	-	-	-	-	-	-	P
The following taxa have been removed from the main data matrix to facilitate analysis											
JUVENILES											
SIPUNCULA	N0001	1268	Stephen, 1964	-	2	-	-	-	-	-	1
Aphroditidae	P0017	938	Malmgren, 1867	-	-	-	-	-	-	-	-
Polynoidae	P0025	939	Kinberg, 1856	-	1	-	-	-	-	-	-
Nereididae	P0458	22496	Blainville, 1818	-	-	-	-	-	-	-	-
Nephtys	P0494	129370	Cuvier, 1817	-	-	-	-	-	-	-	-
Lumbrineridae	P0569	967	Schmarda, 1861	-	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-	-
Cirratulidae	P0822	919	Ryckholt, 1851	-	-	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	1	-	-	-	-	-	-	-
Ampelisca	S0423	101445	Krøyer, 1842	1	-	-	-	-	-	-	-
AXIIDEA	S1403_A	477324	de Saint Laurent, 1979	-	-	-	-	-	-	-	1
Callianassidae	S1413	106800	Dana, 1852	-	-	-	-	-	-	-	-
Upogebia	S1418	107079	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	1	-	-	-
Paguridae	S1445	106738	Latreille, 1802	-	-	-	-	-	-	-	-
Ebalia	S1504	106889	Leach, 1817 [in Leach, 1815-1875]	-	-	1	-	-	-	-	-
Macropodia	S1529	205077	Leach, 1814 [in Leach, 1813-1815]	1	-	-	-	-	-	-	-
Cantharidinae	W0140_F	382171	Gray, 1857	-	-	3	-	-	-	-	-
Steromphala	W0162	576164	Gray, 1847	-	-	-	-	-	-	-	-
Buccinidae	W0702	149	Rafinesque, 1815	-	-	-	-	-	-	-	-
NUDIBRANCHIA	W1243	1762	Cuvier, 1817	-	-	1	-	-	-	-	-
Nucula	W1565	138262	Lamarck, 1799	1	1	1	-	-	-	-	-
Mytilidae	W1691	211	Rafinesque, 1815	-	1	4	-	-	-	1	-
Mytilus	W1693	138228	Linnaeus, 1758	2	-	5	-	-	-	1	-
Modiolus	W1698	138223	Lamarck, 1799	-	3	-	-	-	-	-	-
Musculus	W1719	138225	Röding, 1798	1	-	-	-	-	-	-	-
PECTINOIDEA	W1767	151320	Rafinesque, 1815	7	-	6	-	-	-	-	-
Anomiidae	W1805	214	Rafinesque, 1815	5	1	6	6	9	-	-	11
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	3	3	10	8	-	-	-	-
Mya	W2144	138211	Linnaeus, 1758	-	-	-	-	-	-	-	-
Pholadidae	W2174	252	Lamarck, 1809	-	-	2	-	-	-	-	-
Barnea	W2179	138341	Risso, 1826	-	-	1	-	-	-	-	-
THRACIOIDEA	W2225	382318	Stoliczka, 1870 (1839)	-	1	-	-	-	-	-	-
Thracia	W2227	138549	Blainville, 1824	-	-	-	-	-	-	-	2
Pandoridae	W2248	1787	Rafinesque, 1815	-	-	-	-	-	-	-	-
ASTEROIDEA	ZB0018	123080	de Blainville, 1830	-	-	-	-	-	-	-	-
OPHIUROIDEA	ZB0105	123084	Gray, 1840	-	1	-	-	-	-	-	2
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-	-	6
ECHINOIDEA	ZB0181	123082	Leske, 1778	-	-	-	-	-	-	-	-
CAMARODONTA	ZB0190	510518	Jackson, 1912	-	-	-	-	-	-	-	-
SPATANGOIDA	ZB0213	123106	L. Agassiz, 1840	-	-	-	-	-	-	-	-
PELAGIC FAUNA											
CHAETOGNATHA	L0001	2081	-	-	-	-	-	-	-	-	-
PARASITIC FAUNA											

Taxon	SDC	AphiaID	Authority	FE4_01FA 1201	FE4_02FA 1202	FE4_03FA 1203	FE4_04FA 1204	FE4_05FA 1205	FE4_06FA 1206	FE4_07FA 1207	FE4_08FA 1208
BOPYROIDEA	S0956	155727	Rafinesque, 1815	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**
DAMAGED FAUNA											
Polynoinae	P0025_F	155091	Kinberg, 1856	-	-	4	-	-	-	-	-
Harmothoe	P0050	129491	Kinberg, 1856	2	1	-	7	-	-	-	-
Paucibranchia	P0563_A	1297882	Molina-Acevedo, 2018	-	-	-	-	-	-	-	-
Aonides	P0721	129605	Claparède, 1864	-	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-	-
Dipolydora	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-	-
Maldanidae	P0938	923	Malmgren, 1867	-	-	-	-	-	-	-	-
Euclymeninae	P0951	152232	Arwidsson, 1906	-	-	-	-	-	-	-	-
Nicomachinae	P0976	154920	Arwidsson, 1906	-	-	-	-	-	-	-	-
Scalibregmatidae	P1020	925	Malmgren, 1867	-	-	-	-	-	-	-	-
Owenia	P1097	129427	Delle Chiaje, 1844	-	-	-	-	-	-	-	-
Ampharetidae	P1118	981	Malmgren, 1866	-	-	-	-	1	-	-	-
Ampharetinae	P1125	152252	Malmgren, 1866	-	-	-	-	-	-	-	-
Ampharete	P1133	129155	Malmgren, 1866	-	-	-	-	-	-	-	-
Terebellinae	P1179_A	322588	Johnston, 1846	-	-	-	-	-	-	-	1
POLYCIRRINI	P1227_SF	181512	Malmgren, 1866	-	-	-	-	1	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	1	-	-	-
Serpulidae	P1324	988	Rafinesque, 1815	-	-	-	-	-	1	-	-
Spirobranchus	P1339	129582	Blainville, 1818	-	-	-	-	-	-	-	1
Urothoe	S0246	101789	Dana, 1852	-	-	-	-	-	-	-	-
Ampeliscidae	S0422	101364	Krøyer, 1842	-	-	-	-	-	-	-	-
Anthuridae	S0801	118244	Leach, 1814	-	-	1	-	-	-	-	-
GASTROPODA	W0088	101	Cuvier, 1795	-	-	-	-	-	-	-	-
Bodotria	S1193	110387	Goodsir, 1843	-	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-	-	-

SDC = Species Directory Code

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Cerianthus lloydii	D0632	283798	Gosse, 1859	-	-	-	-	-	-	-	-
ACTINIARIA	D0662	1360	Hertwig, 1882	-	-	2	-	-	-	-	-
Edwardsiidae	D0759	100665	Andres, 1881	-	-	-	-	-	-	-	-
PLATYHELMINTHES	F0001	793	Minot, 1876	-	-	-	-	-	-	-	1
NEMERTEA	G0001	152391	-	2	2	4	3	2	2	1	-
Loxosoma annelidicola	K0006	111811	(Van Beneden & Hesse, 1863)	-	-	-	-	-	-	-	-
Golfingia (Golfingia) elongata	N0014	175026	(Keferstein, 1862)	-	-	-	2	-	-	-	-
Golfingia (Golfingia) vulgaris vulgaris	N0017	410724	(de Blainville, 1827)	-	-	-	-	-	2	-	-
Maxmuelleria lankesteri	O0018	110368	(Herdman, 1897)	-	-	-	-	-	-	-	-
Pisione remota	P0015	130707	(Southern, 1914)	-	-	-	-	-	-	-	-
Subadyte pellucida	P0032	130833	(Ehlers, 1864)	-	-	-	-	-	-	-	-
Gattyana cirrhosa	P0049	130749	(Pallas, 1766)	-	-	1	-	-	-	-	-
Malmgrenia Type A	P0050_G@	147006	McIntosh, 1874	-	-	-	-	-	-	-	-
Malmgrenia bicki	P0050_G@	1044546	Barnich, Dietrich, Hager & Fiege, 2017	-	-	-	-	-	-	-	-
Malmgrenia arenicolae	P0050_G@	152276	(Saint-Joseph, 1888)	-	-	1	-	-	-	-	-
Malmgrenia darbouxi	P0050_G@	863197	(Pettibone, 1993)	-	-	-	-	-	2	-	3
Harmothoe clavigera	P0050_G	130760	(M. Sars, 1863)	-	-	-	-	-	-	-	-
Malmgrenia andreapolis	P0051	147008	McIntosh, 1874	-	-	-	-	-	-	-	-
Harmothoe antilopes	P0052	130754	McIntosh, 1876	-	-	-	-	-	-	-	-
Harmothoe extenuata	P0058	130762	(Grube, 1840)	-	-	-	-	-	-	-	-
Harmothoe impar	P0065	130770	(Johnston, 1839)	-	-	-	-	-	-	-	-
Lepidonotus squamatus	P0082	130801	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Polynoe scolopendrina	P0084	130830	Savigny, 1822	-	-	1	-	-	-	-	-
Pholoe inornata	P0092	130601	Johnston, 1839	4	-	-	3	-	-	-	-
Pholoe baltica	P0095	130599	Örsted, 1843	-	-	2	-	-	2	-	-
Sthenelais boa	P0107	131074	(Johnston, 1833)	-	-	1	-	-	-	-	-
Eteone longa agg.	P0118	130616	(Fabricius, 1780)	-	-	-	-	-	-	-	-
Hesionura elongata	P0122	130649	(Southern, 1914)	-	-	-	-	-	-	-	-
Mysta barbata	P0126	147027	Malmgren, 1865	-	-	1	-	-	1	-	-
Mysta picta	P0127	147026	(Quatrefages, 1866)	-	-	-	-	-	-	-	-
Phyllodoce groenlandica	P0141	334506	Örsted, 1842	-	-	-	-	-	-	-	-
Phyllodoce lineata	P0142	334508	(Claparède, 1870)	-	-	-	-	-	-	-	-
Phyllodoce longipes	P0143	130673	Kinberg, 1866	-	-	-	-	-	-	-	-
Eulalia expusilla	P0153	130625	Pleijel, 1987	-	-	-	-	-	-	-	-
Eulalia mustela	P0155	130631	Pleijel, 1987	-	-	-	-	-	-	-	-
Eulalia ornata	P0156	130632	Saint-Joseph, 1888	-	-	-	-	-	-	-	-
Eumida bahusiensis	P0164	130641	Bergstrom, 1914	-	-	-	-	-	-	-	-
Eumida sanguinea agg.	P0167	130644	(Örsted, 1843)	-	-	-	1	-	-	-	-
Glycera alba	P0256	130116	(O.F. Müller, 1776)	1	-	3	2	-	1	-	3
Glycera lapidum	P0260	130123	Quatrefages, 1866	-	-	2	-	1	-	-	-
Glycera oxycephala	P0262	130126	Ehlers, 1887	-	-	-	-	-	-	-	-
Glycinde nordmanni	P0268	130136	(Malmgren, 1866)	-	1	1	-	-	1	-	-
Goniada maculata	P0271	130140	Örsted, 1843	1	3	2	-	-	2	-	2
Sphaerodorum gracilis	P0291	131100	(Rathke, 1843)	-	-	-	-	-	-	-	1
Podarkeopsis capensis	P0319	130195	(Day, 1963)	1	1	2	-	-	-	-	-
Syllidia armata	P0321	130198	Quatrefages, 1866	-	-	-	-	-	-	-	-
Syllis garciai	P0351	131431	(Campoy, 1982)	-	1	-	-	-	-	-	-
Syllis pontxioi	P0358_A	196003	San Martín & López, 2000	-	-	-	-	-	-	2	-
Syllis armillaris	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Syllis cf. *armillaris*	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Syllis variegata	P0371	131458	Grube, 1860	-	-	1	-	-	-	-	-
Amblyosyllis spectabilis	P0374_A	1258721	(Johnston in Baird, 1861)	-	-	-	-	-	-	-	-
Eusyllis blomstrandi	P0380	131290	Malmgren, 1867	-	-	-	-	-	-	-	-
Odontosyllis fulgurans	P0387	131327	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-	-
Streptodonta pterochaeta	P0391	238207	(Southern, 1914)	-	-	-	-	-	-	-	-
Streptosyllis campoyi	P0402_G	238248	Brito, Núñez & San Martín, 2000	-	-	-	-	-	-	1	-
Syllides japonicus	P0409	131410	Imajima, 1966	-	-	-	-	-	-	-	-
Parexogone hebes	P0421	757970	(Webster & Benedict, 1884)	-	-	-	-	-	-	-	-
Exogone naidina	P0422	327985	Örsted, 1845	-	-	-	1	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Exogone verugera	P0423	333456	(Claparède, 1868)	-	-	-	-	-	-	-	-
Erinaceusyllis erinaceus	P0426	195953	(Claparède, 1863)	-	-	-	-	-	-	-	-
Sphaerosyllis taylori	P0430	131394	Perkins, 1981	-	-	-	-	-	-	-	-
Myrianida	P0449	129659	Milne Edwards, 1845	-	-	3	-	-	-	-	-
Proceraea aurantiaca	P0451_G	131361	Claparède, 1868	-	-	-	-	-	-	-	-
Rullierinereis ancornunezi	P0458_A	492034	Núñez & Brito, 2006	-	-	-	-	-	-	-	-
Eunereis longissima	P0475	130375	(Johnston, 1840)	1	1	2	-	-	-	-	-
Nephtys caeca	P0496	130355	(Fabricius, 1780)	-	-	-	-	-	-	-	-
Nephtys cirrosa	P0498	130357	Ehlers, 1868	-	-	-	-	-	-	-	-
Nephtys hombergii	P0499	130359	Savigny in Lamarck, 1818	-	-	-	-	-	-	-	-
Nephtys kersivalensis	P0502	130363	McIntosh, 1908	-	-	-	-	-	-	-	-
Nephtys longosetosa	P0503	130364	Örsted, 1842	-	-	-	-	-	-	-	-
Lysidice ninetta	P0562	130071	Audouin & H Milne Edwards, 1833	-	-	-	-	-	-	-	-
Paucibranchia totospinata	P0563_B	1305625	(Lu & Fauchald, 1998)	-	1	2	1	-	3	4	2
Paucibranchia bellii	P0564	1297885	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-	-
Marphysa sanguinea	P0566	130075	(Montagu, 1813)	-	-	-	-	-	-	-	-
Lysidice unicornis	P0568	742232	(Grube, 1840)	-	-	-	-	-	-	-	1
Hilbigneris pleijeli	P0569_F	396540	Carrera-Parra, 2006	-	-	-	-	-	-	-	-
Lumbrineris cf. *cingulata*	P0572_A	130240	Ehlers, 1897	-	1	12	9	4	18	2	5
Drilonereis	P0589	129200	Claparède, 1870	-	-	-	-	-	-	-	-
Protodorvillea kefersteini	P0638	130041	(McIntosh, 1869)	-	-	-	-	-	-	-	-
Schistomeringos neglecta	P0642	130044	(Fauvel, 1923)	-	-	-	-	-	-	-	-
Schistomeringos rudolphi	P0643	154127	(Delle Chiaje, 1828)	-	1	1	-	1	-	-	-
Orbinia sertulata	P0665	130523	(Savigny, 1822)	-	-	-	-	-	-	-	1
Scoloplos armiger	P0672	130537	(Müller, 1776)	-	-	-	-	-	-	-	-
Paradoneis lyra	P0699	130585	(Southern, 1914)	2	-	-	2	-	-	1	1
Poecilochaetus serpens	P0718	130711	Allen, 1904	1	-	3	-	1	-	2	-
Aonides oxycephala	P0722	131106	(Sars, 1862)	-	3	4	8	1	4	-	7
Aonides paucibranchiata	P0723	131107	Southern, 1914	-	-	-	-	5	-	6	-
Atherospio guillei	P0724_A	478336	(Laubier & Ramos, 1974)	-	-	-	-	-	-	-	-
Laonice irinae	P0731_G	1518242	Sikorski, Radashevsky & Nygren in Sikorski et al, 2021	-	-	-	-	1	-	-	1
Dipolydora Species A	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	2	-
Dipolydora Type N	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-	-
Polydora ciliata Type A	P0752	131141	(Johnston, 1838)	-	-	-	-	-	-	-	-
Dipolydora flava	P0754	131118	(Claparède, 1870)	-	-	-	-	1	-	-	-
Dipolydora saintjosephi	P0761	131123	(Eliason, 1920)	-	-	-	-	-	-	-	-
Pseudopolydora pulchra	P0774	131169	(Carazzi, 1893)	-	1	-	-	-	2	-	-
Pygospio elegans	P0776	131170	Claparède, 1863	-	-	-	-	-	-	-	-
Scolelepis korsuni	P0777_A	131174	Sikorski, 1994	-	-	-	-	-	-	-	-
Spio	P0787	129625	Fabricius, 1785	-	-	1	-	-	-	-	-
Spiophanes bombyx agg.	P0794	131187	(Claparède, 1870)	-	1	1	-	1	-	1	-
Magelona johnstoni	P0803_A	130269	Fiege, Licher & Mackie, 2000	-	-	-	-	-	-	-	-
Magelona alleni	P0804	130266	Wilson, 1958	2	-	2	2	-	4	-	-
Chaetopterus	P0811	129229	Cuvier, 1830	-	-	-	-	-	-	-	-
Aphelochaeta Type A	P0823	129240	Blake, 1991	-	2	-	-	-	1	1	-
Aphelochaeta marioni	P0824	129938	(Saint-Joseph, 1894)	-	-	-	-	-	-	-	-
Caulleriella alata	P0829	129943	(Southern, 1914)	-	-	1	-	2	6	1	-
Chaetozone zetlandica	P0831	336485	McIntosh, 1911	1	-	2	-	-	-	1	-
Dodecaceria	P0840	129246	Örsted, 1843	-	-	-	-	-	-	-	-
Flabelligera affinis	P0881	130103	M. Sars, 1829	-	-	3	-	-	-	-	1
Pherusa plumosa	P0885	130113	(Müller, 1776)	-	-	-	-	-	-	-	-
Mediomastus fragilis	P0919	129892	Rasmussen, 1973	-	-	1	-	-	-	-	-
Notomastus	P0920	129220	M. Sars, 1851	-	1	3	1	-	5	3	2
Leiochone	**P0951_F**	146991	Grube, 1868	-	1	3	1	-	1	-	-
Euclymene oerstedii	P0964	130294	(Claparède, 1863)	-	-	1	-	-	-	-	-
Praxillella affinis	P0971	130322	(M. Sars in G.O. Sars, 1872)	-	5	2	-	-	3	-	-
Micromaldane ornithochaeta	P0978	130310	Mesnil, 1897	-	-	-	-	-	-	-	-
Nicomache	P0979	129357	Malmgren, 1865	-	-	-	-	-	-	-	-
Petaloproctus	P0985	129359	Quatrefages, 1866	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Ophelia borealis	P0999	130491	Quatrefages, 1866	-	-	-	-	3	-	-	-
Travisia forbesii	P1007	130512	Johnston, 1840	-	-	-	-	-	-	-	-
Asclerocheilus intermedius	P1022	130974	(Saint-Joseph, 1894)	-	-	-	-	-	-	-	-
Scalibregma celticum	P1026	130979	Mackie, 1991	-	-	-	-	-	1	-	3
Scalibregma inflatum	P1027	130980	Rathke, 1843	2	2	5	2	-	8	-	6
Sclerocheilus minutus	P1029	130982	Grube, 1863	-	-	-	-	-	-	-	-
Polygordius	P1062	129472	Schneider, 1868	-	-	-	-	-	-	-	-
Galathowenia oculata	P1093	146950	(Zachs, 1923)	-	-	4	-	-	-	-	-
Owenia borealis	P1097_G	329882	Koh, Bhaud & Jirkov, 2003	-	-	3	-	-	1	-	-
Lagis koreni	P1107	152367	Malmgren, 1866	40	2	12	-	-	2	-	-
Sabellaria spinulosa	P1117	130867	(Leuckart, 1849)	10	-	9	-	2	2	2	-
Melinna palmata	P1124	129808	Grube, 1870	-	-	1	-	-	-	-	-
Ampharete lindstroemi	P1139	129781	Malmgren, 1867 sensu Hessle, 1917	5	1	29	-	-	36	-	8
Amphicteis midas	P1143	129785	(Gosse, 1855)	-	-	-	-	-	-	-	-
Terebellides	P1174	129717	Sars, 1835	-	-	3	-	-	-	-	3
Loimia ramzega	P1200_G	1036014	Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017	-	-	-	-	-	-	-	-
Nicolea venustula	P1210	131507	(Montagu, 1819)	-	-	-	-	-	-	-	-
Amaeana trilobata	P1229	131471	(Sars, 1863)	-	1	-	-	-	-	-	1
Lysilla loveni	P1233	131500	Malmgren, 1866	-	-	-	-	-	-	-	-
Lysilla nivea	P1234	131501	Langerhans, 1884	-	-	-	-	-	-	1	-
Polycirrus	P1235	129710	Grube, 1850	-	-	-	2	-	1	-	-
Thelepus parapari	P1253_G	1253692	Jirkov, 2018	-	-	-	-	-	-	-	-
Thelepus setosus	P1255	131544	(Quatrefages, 1866)	-	-	1	-	-	-	-	1
Jasmineira elegans	P1290	130921	Saint-Joseph, 1894	-	-	-	-	-	-	-	-
Perkinsiana rubra	P1307	130948	(Langerhans, 1880)	-	-	-	-	-	-	-	-
Pseudopotamilla	P1315	129548	Bush, 1905	-	-	-	-	-	-	-	-
Sabella discifera	P1318	130964	Grube, 1874	-	-	-	-	-	-	-	-
Sabella pavonina	P1320	130967	Savigny, 1822	-	-	-	-	-	-	-	-
Spirobranchus lamarcki	P1340	560033	(Quatrefages, 1866)	-	-	4	-	22	8	-	10
Spirobranchus triqueter	P1341	555935	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Tubificoides	P1487	137393	Lastočkin, 1937	-	-	-	-	-	-	-	-
Grania	P1524	137349	Southern, 1913	-	-	-	-	-	-	-	-
Nymphon brevirostre	Q0005	150520	Hodge, 1863	-	-	-	-	-	-	-	-
Achelia echinata	Q0015	134599	Hodge, 1864	-	-	-	-	-	-	-	-
Ammothella longipes	Q0018	134614	(Hodge, 1864)	-	-	-	-	-	-	-	-
Callipallene	**Q0032**	134581	Flynn, 1929	-	-	-	-	-	-	-	-
Anoplodactylus petiolatus	Q0044	134723	(Krøyer, 1844)	-	-	-	-	-	-	-	-
Verruca stroemia	R0041	106257	(O.F. Müller, 1776)	-	-	-	-	1	-	-	5
Balanus crenatus	R0077	106215	Bruguière, 1789	-	-	-	-	-	-	-	-
OSTRACODA	R2412	1078	Latreille, 1802	-	-	-	-	-	-	-	-
Rissoides desmaresti	S0018	136135	(Risso, 1816)	-	-	-	-	-	-	-	-
Gastrosaccus spinifer	S0044	120020	(Goës, 1864)	-	-	-	-	-	-	-	-
Heteromysis (Heteromysis) microps	S0093	120037	(G.O. Sars, 1877)	-	-	-	-	-	-	-	-
Apherusa ovalipes	S0107	102172	Norman & Scott, 1906	-	-	-	-	2	-	-	-
Apolochus neapolitanus	S0159	236495	(Della Valle, 1893)	-	-	-	-	-	-	-	-
Leucothoe procera	S0179	102466	Spence Bate, 1857	-	-	-	-	-	-	-	-
Stenothoe marina	S0213	103166	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Urothoe brevicornis	S0247	103226	Spence Bate, 1862	-	-	-	-	-	-	-	-
Urothoe elegans	S0248	103228	Spence Bate, 1857	-	-	-	-	-	6	-	-
Urothoe marina	S0249	103233	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Harpinia pectinata	S0257	102972	Sars, 1891	-	-	-	-	-	1	-	-
Acidostoma neglectum	S0272_A	102495	Dahl, 1964	-	-	-	-	-	-	-	-
Lysianassa ceratina	S0303	102605	(Walker, 1889)	-	-	-	-	-	-	-	-
Iphimedia minuta	S0380	102345	G.O. Sars, 1883	-	-	-	-	-	-	-	-
Iphimedia nexa	S0381	102346	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-	-
Iphimedia spatula	S0384	102351	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-	-
Nototropis guttatus	S0411	488957	Costa, 1853	-	-	-	-	-	-	-	-
Ampelisca diadema	S0429	101896	(Costa, 1853)	-	-	-	-	-	3	-	-
Ampelisca spinipes	S0438	101928	Boeck, 1861	19	12	72	-	-	21	-	3

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Haploops	S0446	101447	Liljeborg, 1856	1	4	10	1	-	-	-	1
Bathyporeia elegans	S0452	103058	Watkin, 1938	-	-	-	-	-	-	-	-
Bathyporeia guilliamsoniana	S0454	103060	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Bathyporeia pelagica	S0456	103066	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Abludomelita obtusata	S0498	102788	(Montagu, 1813)	-	-	1	-	-	1	-	-
Cheirocratus (female)	S0503	101669	Norman, 1867	-	-	-	-	-	-	-	1
Othomaera othonis	S0519	534781	(H. Milne Edwards, 1830)	-	-	-	-	-	-	-	1
Maerella tenuimana	S0521	102831	(Spence Bate, 1862)	-	-	-	-	-	-	-	-
Megamphopus cornutus	S0539	102377	Norman, 1869	-	-	-	-	-	-	-	-
Gammaropsis maculata	S0541	102364	(Johnston, 1828)	-	-	3	-	-	-	-	-
Photis longicaudata	S0552	102383	(Spence Bate & Westwood, 1862)	-	4	104	1	-	5	-	-
Ericthonius	**S0561**	101567	H. Milne Edwards, 1830	-	-	21	-	-	10	-	2
Jassa	S0568	101571	Leach, 1814	-	-	-	-	-	-	-	-
Microjassa cumbrensis	S0574	102439	(Stebbing & Robertson, 1891)	-	-	-	-	-	-	-	-
Aoridae	**S0577**	101368	Stebbing, 1899	-	-	1	-	-	-	-	-
Crassicorophium crassicorne	S0611	397383	(Bruzelius, 1859)	-	-	-	-	-	-	-	-
Monocorophium sextonae	S0615	148603	(Crawford, 1937)	-	-	-	-	-	-	-	-
Unciola crenatipalma	S0621	102057	(Spence Bate, 1862)	1	-	-	-	-	-	-	-
Dyopedos monacanthus	S0628	489646	(Metzger, 1875)	-	-	-	-	-	-	-	-
Pariambus typicus	S0651	101857	(Krøyer, 1845)	-	-	-	-	-	-	-	-
Phtisica marina	S0657	101864	Slabber, 1769	-	-	1	-	-	-	-	-
Pseudoprotella phasma	S0659	101871	(Montagu, 1804)	-	-	-	1	-	-	-	-
Gnathia oxyuraea	S0796	118995	(Lilljeborg, 1855)	-	-	2	3	-	-	-	-
Anthura gracilis	S0803	118467	(Montagu, 1808)	-	-	-	-	-	-	-	-
Eurydice spinigera	S0855	148637	Hansen, 1890	-	-	-	-	-	-	-	-
Cleantis prismatica	S0947	119038	(Risso, 1826)	-	-	-	-	-	-	-	-
Astacilla longicornis	S0955	119024	(Sowerby, 1806)	-	-	-	-	-	-	-	-
Apseudes talpa	S1177	136285	(Montagu, 1808)	-	-	-	-	-	-	-	-
Bodotria scorpioides	S1197	110445	(Montagu, 1804)	-	-	2	-	-	2	-	-
Diastylis bradyi	S1248	110472	Norman, 1879	-	-	-	-	-	-	-	-
Diastylis rathkei	S1253	110487	(Krøyer, 1841)	-	-	-	-	-	-	-	-
Eualus cranchii	S1360	156083	(Leach, 1817 [in Leach, 1815-1875])	-	-	-	-	-	-	-	-
Axius stirhynchus	S1407	107722	Leach, 1816	-	-	1	-	-	-	-	-
Callianassa subterranea	S1415	107729	(Montagu, 1808)	-	-	1	-	-	-	-	-
Upogebia deltaura	S1419	107739	(Leach, 1816)	-	-	-	-	-	1	-	-
Anapagurus hyndmanni	S1448	107217	(Bell, 1845 [in Bell, 1844-1853])	-	-	-	-	-	-	-	-
Galathea intermedia	S1472	107150	Lilljeborg, 1851	-	-	-	-	-	-	-	2
Pisidia longicornis	S1482	107188	(Linnaeus, 1767)	-	-	2	-	-	-	-	6
Ebalia tuberosa	S1508	107301	(Pennant, 1777)	-	-	-	-	-	-	-	1
Ebalia tumefacta	S1509	107302	(Montagu, 1808)	-	-	-	-	-	-	-	-
Hyas coarctatus	S1519	107323	Leach, 1815 [in Leach, 1815-1875]	-	-	-	-	-	-	-	-
Macropodia rostrata	S1532	107345	(Linnaeus, 1761)	-	-	1	-	-	-	-	-
Atelecyclus rotundatus	S1555	107273	(Olivi, 1792)	-	-	-	-	-	1	-	-
Thia scutellata	S1559	107281	(Fabricius, 1793)	-	-	-	-	-	-	-	-
Pilumnus hirtellus	S1615	107418	(Linnaeus, 1761)	-	-	1	-	-	-	-	-
Leptochiton asellus	W0053	140199	(Gmelin, 1791)	-	1	2	-	2	1	1	8
Puncturella noachina	W0112	139975	(Linnaeus, 1771)	-	-	-	-	-	-	-	-
Steromphala tumida	W0161	1477356	(Montagu, 1803)	-	-	-	-	-	-	-	2
Steromphala cineraria	W0163	1039839	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Calliostoma zizyphinum	W0182	141767	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Crisilla semistriata	W0348	141280	(Montagu, 1808)	-	-	-	-	-	-	-	-
Caecum glabrum	W0418	138952	(Montagu, 1803)	-	-	-	-	-	-	-	-
Crepidula fornicata	W0439	138963	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Euspira nitida	W0491	151894	(Donovan, 1803)	-	-	-	-	-	-	-	-
Epitonium clathratulum	W0556	139718	(Kanmacher, 1798)	-	-	-	-	-	-	-	-
Ocenebra erinaceus	W0685	140405	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Buccinum undatum	W0708	138878	Linnaeus, 1758	-	-	-	-	-	-	-	-
Brachystomia eulimoides	W0922	491650	(Hanley, 1844)	-	-	-	-	-	-	-	-
Philine quadripartita	W1038_A	574582	Ascanius, 1772	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Duvaucelia	W1245_F	536858	Risso, 1826	-	-	-	-	-	-	-	-
Doto	W1270	137916	Oken, 1815	-	-	4	-	-	-	-	-
Acanthodoris pilosa	W1333	140627	(Abildgaard [in Müller], 1789)	-	-	-	-	-	-	-	-
Nucula hanleyi	W1568	140588	Winckworth, 1931	-	-	-	-	-	-	-	-
Nucula nitidosa	W1569	140589	Winckworth, 1930	-	-	-	-	-	-	-	-
Nucula nucleus	W1570	140590	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Striarca lactea	W1676	140571	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Glycymeris glycymeris	W1688	140025	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Mytilus edulis	W1695	140480	Linnaeus, 1758	-	-	-	-	-	-	-	-
Modiolus adriaticus	W1700	140462	Lamarck, 1819	-	-	-	-	-	-	-	-
Modiolus barbatus	W1701	140464	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Modiolula phaseolina	W1708	140461	(Philippi, 1844)	-	-	-	-	-	-	-	-
Musculus discors	W1721	140472	(Linnaeus, 1767)	-	-	-	-	-	-	-	-
Aequipecten opercularis	W1773	140687	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Heteranomia squamula	W1809	138749	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Diplodonta rotundata	W1864	141883	(Montagu, 1803)	-	-	-	-	-	-	4	-
Kellia suborbicularis	W1875	140161	(Montagu, 1803)	-	-	-	-	-	-	-	-
Tellimya ferruginosa	W1902	146952	(Montagu, 1808)	-	-	-	-	-	2	-	-
Kurtiella bidentata	W1906	345281	(Montagu, 1803)	10	2	6	1	-	4	1	-
Epilepton clarkiae	W1911	140366	(W. Clark, 1852)	-	-	-	-	-	-	-	-
Goodallia triangularis	W1929	138831	(Montagu, 1803)	-	-	-	-	1	-	-	-
Spisula elliptica	W1975	140300	(T. Brown, 1827)	-	-	-	-	-	-	-	-
Phaxas pellucidus	W2006	140737	(Pennant, 1777)	-	-	-	-	-	-	-	-
Moerella donacina	W2021	147021	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Asbjornsenia pygmaea	W2023	879714	(Lovén, 1846)	-	-	-	-	-	-	-	-
Abra alba	W2059	141433	(W. Wood, 1802)	-	1	4	-	-	-	-	1
Abra prismatica	W2062	141436	(Montagu, 1808)	-	-	-	-	-	-	-	-
Clausinella fasciata	W2100	141909	(da Costa, 1778)	-	-	-	-	-	-	-	-
Timoclea ovata	W2104	141929	(Pennant, 1777)	-	-	1	-	-	1	-	-
Polititapes rhomboides	W2113	745846	(Pennant, 1777)	-	-	-	-	-	-	-	-
Mya truncata	W2147	140431	Linnaeus, 1758	-	-	-	-	-	-	-	-
Sphenia binghami	W2152	140432	W. Turton, 1822	-	-	-	-	-	-	-	-
Varicorbula gibba	W2157	378492	(Olivi, 1792)	-	-	1	-	-	-	-	1
Rocellaria dubia	W2162	505249	(Pennant, 1777)	-	-	-	-	-	-	-	3
Hiatella	W2165	138068	Bosc, 1801	-	-	-	-	-	-	-	-
Saxicavella jeffreysi	W2172	140108	Winckworth, 1930	-	-	-	-	-	-	-	-
Barnea parva	W2183	140768	(Pennant, 1777)	-	-	-	-	-	-	-	-
Thracia villosiuscula	W2233	141651	(MacGillivray, 1827)	-	-	-	-	-	-	-	-
Thracia distorta	W2235	141647	(Montagu, 1803)	-	-	-	-	-	-	-	-
Phoronis	ZA0003	128545	Wright, 1856	-	1	1	-	-	-	17	2
Ophiothrix fragilis	ZB0124	125131	(Abildgaard in O.F. Müller, 1789)	-	-	-	-	-	-	-	3
Acrocnida brachiata	ZB0151	236130	(Montagu, 1804)	1	-	-	-	-	-	-	-
Amphiura filiformis	ZB0154	125080	(O.F. Müller, 1776)	-	-	-	-	-	-	1	-
Amphipholis squamata	ZB0161	125064	(Delle Chiaje, 1828)	-	-	3	-	3	2	-	1
Ophiocten affinis	ZB0167	124850	(Lütken, 1858)	-	-	-	-	1	-	-	-
Ophiura albida	ZB0168	124913	Forbes, 1839	3	1	11	-	-	2	-	9
Ophiura ophiura	ZB0170	124929	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Psammechinus miliaris	ZB0193	124319	(P.L.S. Müller, 1771)	-	-	3	1	1	-	-	1
Echinocyamus pusillus	ZB0212	124273	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Echinocardium cordatum	ZB0223	124392	(Pennant, 1777)	-	-	-	-	-	1	-	-
ENTEROPNEUSTA	ZC0012	1820	Gegenbaur, 1870	-	-	-	-	-	1	-	-
ASCIDIACEA	ZD0002	1839	Blainville, 1824	-	-	2	-	-	-	-	3
			Number of taxa:	288	288	288	288	288	288	288	288
			Abundance:	108	58	403	48	58	184	55	119

The following taxa (highlighted below) are merged in rationalised dataset above

Leiochone	P0951_F	146991	Grube, 1868	-	-	2	1	-	1	-	-
Leiochone tricirrata	P0951_F	328694	Bellan & Reys, 1967	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Leiochone johnstoni	P0958	221095	McIntosh, 1915	-	1	1	-	-	-	-	-
Leiochone	P0951_F	146991	Grube, 1868	-	1	3	1	-	1	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-	-
Callipallene tiberii	Q0038	134648	(Dohrn, 1881)	-	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	11	-	-	7	-	1
Ericthonius punctatus	S0564	102408	(Spence Bate, 1857)	-	-	10	-	-	3	-	1
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	21	-	-	10	-	2
Aoridae	S0577	101368	Stebbing, 1899	-	-	1	-	-	-	-	-
Leptocheirus hirsutimanus	S0588	102036	(Spence Bate, 1862)	-	-	-	-	-	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	1	-	-	-	-	-
PRESENCE/ABSENCE DATA											
Folliculinidae	A0003	1692	Dons, 1914	-	-	-	-	-	-	-	P
PORIFERA	C0001	558	Grant, 1836	-	-	-	-	P	P	-	-
Cliona agg.	C0475	132026	Grant, 1826	-	-	-	-	-	-	-	-
Raspailiidae	C1258	131642	Nardo, 1833	-	-	-	-	-	-	-	-
Haleciidae	D0389	1608	Hincks, 1868	-	-	-	-	-	-	-	-
Halecium	D0390	117103	Oken, 1815	-	-	-	-	-	-	-	-
Sertulariidae	D0407	1614	Lamouroux, 1812	-	-	P	-	-	P	-	-
Hydrallmania falcata	D0424	117890	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Sertularella	D0427	117233	Gray, 1848	-	-	-	-	-	-	-	-
Sertularia	D0433	117234	Linnaeus, 1758	-	-	-	-	-	-	-	-
Plumulariidae	D0447	1613	McCrady, 1859	-	-	-	-	-	-	-	-
Nemertesia	D0462	117195	Lamouroux, 1812	-	-	-	-	-	-	-	-
Plumularia setacea	D0469	117824	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Campanulariidae	D0491	1606	Johnston, 1836	-	-	-	-	-	-	-	-
Clytia	D0501	117030	Lamouroux, 1812	-	-	-	-	-	-	-	-
Clytia hemisphaerica	D0503	117368	(Linnaeus, 1767)	-	-	P	-	-	-	-	-
Alcyonium digitatum	D0597	125333	Linnaeus, 1758	-	-	-	-	-	P	-	P
Epizoanthus	D0648	100790	Gray, 1867	-	-	-	-	-	-	-	-
Crisia aculeata	Y0014	111690	Hassall, 1841	-	-	-	-	-	-	-	-
Oncousoecia dilatans	Y0025	111745	(Johnston, 1847)	-	-	-	-	-	-	-	-
Tubuliporidae	Y0026	110814	Johnston, 1837	-	-	-	-	-	-	-	P
Plagioecia patina	Y0041	111719	(Lamarck, 1816)	-	-	-	-	-	-	-	-
Disporella hispida	Y0066	111730	(Fleming, 1828)	-	-	-	-	P	-	-	P
Alcyonidiidae	Y0072	110783	Johnston, 1837	-	-	-	-	-	-	-	-
Alcyonidium	Y0073	110993	J.V.F.Lamouroux, 1813	-	-	-	-	-	-	-	-
Alcyonidium diaphanum	Y0076	111597	(Hudson, 1778)	-	-	-	-	-	-	-	-
Nolella dilatata	Y0092	111632	(Hincks, 1860)	-	-	-	-	-	-	-	-
Vesicularia spinosa	Y0131	111669	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Amathia lendigera	Y0135	111659	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Scruparia ambigua	Y0161	111539	(d'Orbigny, 1841)	-	-	-	-	-	-	-	-
Conopeum reticulum	Y0172	111351	(Linnaeus, 1767)	-	-	-	-	-	-	-	-
Electra monostachys	Y0177	111354	(Busk, 1854)	-	-	-	-	-	-	-	-
Electra pilosa	Y0178	111355	(Linnaeus, 1767)	-	-	-	-	-	-	-	-
Aspidelectra melolontha	Y0182	111350	(Landsborough, 1852)	-	-	-	-	-	P	-	-
Chartella papyracea	Y0192	111365	(Ellis & Solander, 1786)	-	-	-	-	-	-	-	-
Hincksina flustroides	Y0196	111369	(Hincks, 1877)	-	-	-	-	-	-	-	-
Amphiblestrum auritum	Y0222	111186	(Hincks, 1877)	-	-	-	-	-	-	-	-
Crisularia plumosa	Y0246	834039	(Pallas, 1766)	-	-	-	-	-	-	-	-
Bicellariella ciliata	Y0256	111147	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Puellina	Y0315	110897	Jullien, 1886	-	-	-	-	-	-	-	-
Hippothoa divaricata	Y0332	111399	Lamouroux, 1821	-	-	-	-	-	-	-	-
Chorizopora brongniartii	Y0344	111304	(Audouin, 1826)	-	-	-	-	-	-	-	-
Escharella immersa	Y0364	111484	(Fleming, 1828)	-	-	-	-	P	P	-	P
Escharella variolosa	Y0369	111495	(Johnston, 1838)	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
Escharella ventricosa	Y0370	111496	(Hassall, 1842)	-	-	-	-	-	-	-	-
Neolagenipora collaris	Y0376	111509	(Norman, 1867)	-	-	-	-	-	-	-	-
Porella concinna	Y0385	111125	(Busk, 1854)	-	-	-	-	-	-	-	-
Reptadeonella violacea	Y0401	111061	(Johnston, 1847)	-	-	-	-	-	-	-	-
Schizoporella hesperia	Y0427	111528	Hayward & Ryland, 1995	-	-	-	-	-	-	-	-
Escharina johnstoni	Y0440	111518	(Quelch, 1884)	-	-	-	-	-	-	-	-
Schizomavella	Y0467	110829	Canu & Bassler, 1917	-	-	P	P	P	P	P	P
Schizomavella (Schizomavella) linearis	Y0474	862795	(Hassall, 1841)	-	-	-	-	-	-	-	-
Microporella ciliata	Y0480	111421	(Pallas, 1766)	-	-	-	-	-	-	-	-
Fenestrulina	Y0482	110941	Jullien, 1888	-	-	-	-	-	-	-	-
Hagiosynodos latus	Y0520	111391	(Busk, 1856)	-	-	-	-	-	-	-	-
Didemnidae	ZD0041	103439	Giard, 1872	-	-	-	-	-	-	-	-
The following taxa have been removed from the main data matrix to facilitate analysis											
JUVENILES											
SIPUNCULA	N0001	1268	Stephen, 1964	-	1	3	-	-	-	-	-
Aphroditidae	P0017	938	Malmgren, 1867	-	-	-	-	-	-	-	-
Polynoidae	P0025	939	Kinberg, 1856	-	-	-	-	-	-	-	-
Nereididae	P0458	22496	Blainville, 1818	-	-	-	-	-	1	-	-
Nephtys	P0494	129370	Cuvier, 1817	-	-	-	-	-	-	-	-
Lumbrineridae	P0569	967	Schmarda, 1861	1	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-	-
Cirratulidae	P0822	919	Ryckholt, 1851	-	1	-	2	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-	-
Ampelisca	S0423	101445	Krøyer, 1842	-	-	-	-	-	-	-	-
AXIIDEA	S1403_A	477324	de Saint Laurent, 1979	-	-	-	-	-	-	-	-
Callianassidae	S1413	106800	Dana, 1852	-	-	-	-	-	-	-	-
Upogebia	S1418	107079	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-	-
Paguridae	S1445	106738	Latreille, 1802	-	-	-	-	-	-	-	-
Ebalia	S1504	106889	Leach, 1817 [in Leach, 1815-1875]	-	-	-	-	-	-	-	-
Macropodia	S1529	205077	Leach, 1814 [in Leach, 1813-1815]	-	-	2	-	-	-	-	-
Cantharidinae	W0140_F	382171	Gray, 1857	-	-	-	-	-	-	-	-
Steromphala	W0162	576164	Gray, 1847	-	-	-	-	-	-	-	-
Buccinidae	W0702	149	Rafinesque, 1815	-	-	-	-	-	-	-	-
NUDIBRANCHIA	W1243	1762	Cuvier, 1817	-	-	-	-	-	-	-	-
Nucula	W1565	138262	Lamarck, 1799	-	-	-	-	-	-	-	-
Mytilidae	W1691	211	Rafinesque, 1815	-	-	-	-	-	-	-	-
Mytilus	W1693	138228	Linnaeus, 1758	-	-	-	-	-	-	-	-
Modiolus	W1698	138223	Lamarck, 1799	-	-	-	-	-	-	-	-
Musculus	W1719	138225	Röding, 1798	-	-	-	-	-	-	-	-
PECTINOIDEA	W1767	151320	Rafinesque, 1815	-	-	2	-	-	1	-	-
Anomiidae	W1805	214	Rafinesque, 1815	-	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	1	-	4	-	-	2	-	1
Mya	W2144	138211	Linnaeus, 1758	-	-	-	-	-	-	-	-
Pholadidae	W2174	252	Lamarck, 1809	-	-	2	-	-	2	-	-
Barnea	W2179	138341	Risso, 1826	-	-	-	-	-	-	-	-
THRACIOIDEA	W2225	382318	Stoliczka, 1870 (1839)	-	-	-	-	-	-	-	-
Thracia	W2227	138549	Blainville, 1824	-	-	-	-	-	-	-	-
Pandoridae	W2248	1787	Rafinesque, 1815	-	-	-	-	-	-	-	-
ASTEROIDEA	ZB0018	123080	de Blainville, 1830	-	-	-	-	-	-	-	-
OPHIUROIDEA	ZB0105	123084	Gray, 1840	-	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	4	-	-	-	-	-	-	-
ECHINOIDEA	ZB0181	123082	Leske, 1778	-	-	-	-	-	-	-	-
CAMARODONTA	ZB0190	510518	Jackson, 1912	-	-	-	-	-	-	-	-
SPATANGOIDA	ZB0213	123106	L. Agassiz, 1840	-	-	-	-	-	-	-	-
PELAGIC FAUNA											
CHAETOGNATHA	L0001	2081	-	-	-	-	-	-	-	-	-
PARASITIC FAUNA											

Taxon	SDC	AphiaID	Authority	FE5_01FA 1209	FE5_02FA 1210	FE5_03FA 1211	FE5_04FA 1212	FE5_05FA 1213	FE5_06FA 1214	FE5_07FA 1215	FE5_08FA 1216
BOPYROIDEA	S0956	155727	Rafinesque, 1815	-	-	1	-	-	-	-	-
DAMAGED FAUNA											
Polynoinae	P0025_F	155091	Kinberg, 1856	-	-	-	-	1	-	-	-
Harmothoe	P0050	129491	Kinberg, 1856	-	-	-	-	-	-	-	-
Paucibranchia	P0563_A	1297882	Molina-Acevedo, 2018	-	-	1	-	-	-	-	-
Aonides	P0721	129605	Claparède, 1864	-	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-	-
Dipolydora	P0748_A	129611	Verrill, 1881	-	1	-	-	-	-	-	-
Maldanidae	P0938	923	Malmgren, 1867	-	-	4	-	-	-	-	-
Euclymeninae	P0951	152232	Arwidsson, 1906	-	-	-	-	-	-	-	-
Nicomachinae	P0976	154920	Arwidsson, 1906	-	-	-	-	-	-	-	-
Scalibregmatidae	P1020	925	Malmgren, 1867	-	-	-	-	-	-	-	-
Owenia	P1097	129427	Delle Chiaje, 1844	-	-	-	-	-	-	-	-
Ampharetidae	P1118	981	Malmgren, 1866	-	-	-	-	-	-	-	-
Ampharetinae	P1125	152252	Malmgren, 1866	-	-	-	-	-	-	-	-
Ampharete	P1133	129155	Malmgren, 1866	-	2	-	-	-	-	-	-
Terebellinae	P1179_A	322588	Johnston, 1846	-	-	-	-	-	-	-	-
POLYCIRRINI	P1227_SF	181512	Malmgren, 1866	-	1	-	-	-	-	1	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-	-
Serpulidae	P1324	988	Rafinesque, 1815	-	-	-	-	-	-	-	-
Spirobranchus	P1339	129582	Blainville, 1818	-	1	-	-	-	-	-	-
Urothoe	S0246	101789	Dana, 1852	-	-	-	-	-	-	-	-
Ampeliscidae	S0422	101364	Krøyer, 1842	-	-	2	6	-	-	-	-
Anthuridae	S0801	118244	Leach, 1814	-	-	-	-	-	-	-	-
GASTROPODA	W0088	101	Cuvier, 1795	-	-	1	-	-	-	-	-
Bodotria	S1193	110387	Goodsir, 1843	-	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-	-	3

SDC = Species Directory Code

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Cerianthus lloydii	D0632	283798	Gosse, 1859	2	-	1	-	-	-	-	-
ACTINIARIA	D0662	1360	Hertwig, 1882	16	-	3	-	-	-	-	-
Edwardsiidae	D0759	100665	Andres, 1881	-	-	-	-	-	-	-	-
PLATYHELMINTHES	F0001	793	Minot, 1876	-	-	-	-	-	-	-	-
NEMERTEA	G0001	152391	-	2	2	2	1	2	5	-	1
Loxosoma annelidicola	K0006	111811	(Van Beneden & Hesse, 1863)	-	-	-	-	-	-	-	-
Golfingia (Golfingia) elongata	N0014	175026	(Keferstein, 1862)	-	-	-	-	-	-	-	-
Golfingia (Golfingia) vulgaris vulgaris	N0017	410724	(de Blainville, 1827)	-	-	1	-	-	-	-	-
Maxmuelleria lankesteri	O0018	110368	(Herdman, 1897)	-	-	-	-	-	-	-	-
Pisione remota	P0015	130707	(Southern, 1914)	-	-	-	-	-	16	-	-
Subadyte pellucida	P0032	130833	(Ehlers, 1864)	1	-	-	-	-	-	-	-
Gattyana cirrhosa	P0049	130749	(Pallas, 1766)	-	-	-	-	-	-	-	-
Malmgrenia Type A	P0050_G@	147006	McIntosh, 1874	-	-	-	-	-	-	-	-
Malmgrenia bicki	P0050_G@	1044546	Barnich, Dietrich, Hager & Fiege, 2017	-	-	-	-	1	-	-	-
Malmgrenia arenicolae	P0050_G@	152276	(Saint-Joseph, 1888)	-	-	-	-	-	-	-	-
Malmgrenia darbouxi	P0050_G@	863197	(Pettibone, 1993)	-	-	-	-	-	-	-	-
Harmothoe clavigera	P0050_G	130760	(M. Sars, 1863)	-	-	-	-	-	-	-	-
Malmgrenia andreapolis	P0051	147008	McIntosh, 1874	-	-	-	-	-	-	-	-
Harmothoe antilopes	P0052	130754	McIntosh, 1876	1	-	-	-	-	-	-	-
Harmothoe extenuata	P0058	130762	(Grube, 1840)	-	-	-	-	-	-	-	-
Harmothoe impar	P0065	130770	(Johnston, 1839)	-	-	-	-	-	-	-	-
Lepidonotus squamatus	P0082	130801	(Linnaeus, 1758)	-	-	1	-	-	-	-	-
Polynoe scolopendrina	P0084	130830	Savigny, 1822	-	-	-	-	-	-	-	-
Pholoe inornata	P0092	130601	Johnston, 1839	-	1	-	-	-	-	-	-
Pholoe baltica	P0095	130599	Örsted, 1843	-	-	3	-	-	-	-	-
Sthenelais boa	P0107	131074	(Johnston, 1833)	-	-	-	-	2	-	-	-
Eteone longa agg.	P0118	130616	(Fabricius, 1780)	-	1	-	-	-	-	-	-
Hesionura elongata	P0122	130649	(Southern, 1914)	-	-	-	-	-	-	3	6
Mysta barbata	P0126	147027	Malmgren, 1865	-	-	-	-	-	-	-	-
Mysta picta	P0127	147026	(Quatrefages, 1866)	-	-	-	-	-	-	-	-
Phyllodoce groenlandica	P0141	334506	Örsted, 1842	-	-	-	-	-	-	-	-
Phyllodoce lineata	P0142	334508	(Claparède, 1870)	-	-	-	-	-	-	-	-
Phyllodoce longipes	P0143	130673	Kinberg, 1866	-	-	-	1	-	-	-	-
Eulalia expusilla	P0153	130625	Pleijel, 1987	-	-	-	-	-	-	-	-
Eulalia mustela	P0155	130631	Pleijel, 1987	-	-	-	-	-	-	-	-
Eulalia ornata	P0156	130632	Saint-Joseph, 1888	-	-	-	-	1	-	-	-
Eumida bahusiensis	P0164	130641	Bergstrom, 1914	-	-	-	-	-	-	-	-
Eumida sanguinea agg.	P0167	130644	(Örsted, 1843)	-	-	-	-	-	-	-	-
Glycera alba	P0256	130116	(O.F. Müller, 1776)	2	-	1	-	-	-	-	-
Glycera lapidum	P0260	130123	Quatrefages, 1866	-	2	1	-	2	1	-	-
Glycera oxycephala	P0262	130126	Ehlers, 1887	-	-	1	-	-	-	-	1
Glycinde nordmanni	P0268	130136	(Malmgren, 1866)	-	-	-	1	1	-	-	-
Goniada maculata	P0271	130140	Örsted, 1843	-	-	-	-	-	-	-	-
Sphaerodorum gracilis	P0291	131100	(Rathke, 1843)	1	-	-	-	-	-	-	-
Podarkeopsis capensis	P0319	130195	(Day, 1963)	-	-	-	-	-	-	-	-
Syllidia armata	P0321	130198	Quatrefages, 1866	1	-	-	-	-	-	-	-
Syllis garciai	P0351	131431	(Campoy, 1982)	-	1	-	-	-	-	-	-
Syllis pontxioi	P0358_A	196003	San Martín & López, 2000	-	-	-	-	-	-	-	-
Syllis armillaris	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Syllis cf. *armillaris*	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Syllis variegata	P0371	131458	Grube, 1860	-	-	-	-	1	-	-	-
Amblyosyllis spectabilis	P0374_A	1258721	(Johnston in Baird, 1861)	-	-	-	-	-	-	-	-
Eusyllis blomstrandi	P0380	131290	Malmgren, 1867	-	-	-	-	2	-	-	-
Odontosyllis fulgurans	P0387	131327	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-	-
Streptodonta pterochaeta	P0391	238207	(Southern, 1914)	-	-	-	-	-	-	-	-
Streptosyllis campoyi	P0402_G	238248	Brito, Núñez & San Martín, 2000	-	-	-	-	-	-	-	-
Syllides japonicus	P0409	131410	Imajima, 1966	-	-	-	-	-	-	-	-
Parexogone hebes	P0421	757970	(Webster & Benedict, 1884)	-	-	-	-	-	-	-	-
Exogone naidina	P0422	327985	Örsted, 1845	-	-	1	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Exogone verugera	P0423	333456	(Claparède, 1868)	-	-	-	-	1	-	-	-
Erinaceusyllis erinaceus	P0426	195953	(Claparède, 1863)	-	-	-	-	-	-	-	-
Sphaerosyllis taylori	P0430	131394	Perkins, 1981	1	-	-	-	-	-	-	-
Myrianida	P0449	129659	Milne Edwards, 1845	-	-	-	-	-	-	-	-
Proceraea aurantiaca	P0451_G	131361	Claparède, 1868	-	-	-	-	-	-	-	-
Rullierinereis ancornunezi	P0458_A	492034	Núñez & Brito, 2006	-	-	-	-	1	-	-	-
Eunereis longissima	P0475	130375	(Johnston, 1840)	-	2	1	-	-	-	-	-
Nephtys caeca	P0496	130355	(Fabricius, 1780)	-	-	-	-	-	-	-	-
Nephtys cirrosa	P0498	130357	Ehlers, 1868	-	-	-	-	-	-	-	-
Nephtys hombergii	P0499	130359	Savigny in Lamarck, 1818	-	-	1	-	-	-	-	-
Nephtys kersivalensis	P0502	130363	McIntosh, 1908	-	-	-	-	-	-	-	-
Nephtys longosetosa	P0503	130364	Örsted, 1842	-	-	-	-	-	-	-	-
Lysidice ninetta	P0562	130071	Audouin & H Milne Edwards, 1833	-	-	-	-	-	-	-	-
Paucibranchia totospinata	P0563_B	1305625	(Lu & Fauchald, 1998)	-	2	2	-	-	-	-	-
Paucibranchia bellii	P0564	1297885	(Audouin & Milne Edwards, 1833)	-	-	-	-	1	-	-	-
Marphysa sanguinea	P0566	130075	(Montagu, 1813)	-	-	-	-	-	-	-	-
Lysidice unicornis	P0568	742232	(Grube, 1840)	-	-	-	-	-	-	-	-
Hilbigneris pleijeli	P0569_F	396540	Carrera-Parra, 2006	-	-	-	-	-	-	-	-
Lumbrineris cf. *cingulata*	P0572_A	130240	Ehlers, 1897	14	10	9	4	7	-	-	-
Drilonereis	P0589	129200	Claparède, 1870	-	-	-	-	-	-	-	-
Protodorvillea kefersteini	P0638	130041	(McIntosh, 1869)	-	-	-	-	-	-	-	-
Schistomeringos neglecta	P0642	130044	(Fauvel, 1923)	-	-	-	-	-	-	-	-
Schistomeringos rudolphi	P0643	154127	(Delle Chiaje, 1828)	1	1	1	-	-	-	-	-
Orbinia sertulata	P0665	130523	(Savigny, 1822)	-	-	-	-	-	-	-	-
Scoloplos armiger	P0672	130537	(Müller, 1776)	-	-	-	-	-	-	-	-
Paradoneis lyra	P0699	130585	(Southern, 1914)	1	1	2	-	-	-	-	-
Poecilochaetus serpens	P0718	130711	Allen, 1904	-	-	2	-	-	-	-	-
Aonides oxycephala	P0722	131106	(Sars, 1862)	2	-	1	-	-	-	-	-
Aonides paucibranchiata	P0723	131107	Southern, 1914	-	1	-	-	4	-	-	-
Atherospio guillei	P0724_A	478336	(Laubier & Ramos, 1974)	-	1	-	-	-	-	-	-
Laonice irinae	P0731_G	1518242	Sikorski, Radashevsky & Nygren in Sikorski et al, 2021	-	2	-	1	-	-	-	-
Dipolydora Species A	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-	-
Dipolydora Type N	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-	-
Polydora ciliata Type A	P0752	131141	(Johnston, 1838)	-	-	-	-	-	-	-	-
Dipolydora flava	P0754	131118	(Claparède, 1870)	-	-	1	-	-	-	-	-
Dipolydora saintjosephi	P0761	131123	(Eliason, 1920)	-	-	-	-	-	-	-	-
Pseudopolydora pulchra	P0774	131169	(Carazzi, 1893)	-	-	-	-	1	-	-	-
Pygospio elegans	P0776	131170	Claparède, 1863	-	-	-	-	-	-	-	-
Scolelepis korsuni	P0777_A	131174	Sikorski, 1994	-	-	-	-	1	-	-	-
Spio	P0787	129625	Fabricius, 1785	-	-	-	-	-	-	-	-
Spiophanes bombyx agg.	P0794	131187	(Claparède, 1870)	-	1	2	-	2	-	-	-
Magelona johnstoni	P0803_A	130269	Fiege, Licher & Mackie, 2000	-	-	-	-	-	-	-	-
Magelona alleni	P0804	130266	Wilson, 1958	-	-	-	-	-	-	-	-
Chaetopterus	P0811	129229	Cuvier, 1830	-	-	-	-	-	-	-	-
Aphelochaeta Type A	P0823	129240	Blake, 1991	-	-	-	-	-	-	-	-
Aphelochaeta marioni	P0824	129938	(Saint-Joseph, 1894)	-	-	-	-	-	-	-	-
Caulleriella alata	P0829	129943	(Southern, 1914)	1	4	1	1	1	-	-	-
Chaetozone zetlandica	P0831	336485	McIntosh, 1911	-	-	2	1	1	-	-	-
Dodecaceria	P0840	129246	Örsted, 1843	-	-	-	-	-	-	-	-
Flabelligera affinis	P0881	130103	M. Sars, 1829	1	-	2	-	7	-	-	-
Pherusa plumosa	P0885	130113	(Müller, 1776)	-	-	-	-	-	-	-	-
Mediomastus fragilis	P0919	129892	Rasmussen, 1973	4	-	-	1	1	-	-	-
Notomastus	P0920	129220	M. Sars, 1851	2	2	1	-	1	2	1	-
Leiochone	**P0951_F**	146991	Grube, 1868	-	2	15	5	2	-	-	-
Euclymene oerstedii	P0964	130294	(Claparède, 1863)	-	-	-	-	-	-	-	-
Praxillella affinis	P0971	130322	(M. Sars in G.O. Sars, 1872)	-	-	3	-	5	-	-	-
Micromaldane ornithochaeta	P0978	130310	Mesnil, 1897	-	-	-	-	-	-	-	-
Nicomache	P0979	129357	Malmgren, 1865	-	-	-	-	-	-	-	-
Petaloproctus	P0985	129359	Quatrefages, 1866	-	3	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Ophelia borealis	P0999	130491	Quatrefages, 1866	-	-	-	-	-	-	-	-
Travisia forbesii	P1007	130512	Johnston, 1840	-	-	-	-	-	-	-	-
Asclerocheilus intermedius	P1022	130974	(Saint-Joseph, 1894)	-	-	-	-	-	-	-	-
Scalibregma celticum	P1026	130979	Mackie, 1991	2	-	-	-	-	-	-	-
Scalibregma inflatum	P1027	130980	Rathke, 1843	-	6	-	-	-	-	-	-
Sclerocheilus minutus	P1029	130982	Grube, 1863	-	-	-	-	-	-	-	-
Polygordius	P1062	129472	Schneider, 1868	-	-	-	-	-	-	-	-
Galathowenia oculata	P1093	146950	(Zachs, 1923)	-	-	-	-	-	-	-	-
Owenia borealis	P1097_G	329882	Koh, Bhaud & Jirkov, 2003	-	-	1	-	1	-	-	-
Lagis koreni	P1107	152367	Malmgren, 1866	1	1	4	-	3	-	-	-
Sabellaria spinulosa	P1117	130867	(Leuckart, 1849)	-	2	-	4	15	-	-	-
Melinna palmata	P1124	129808	Grube, 1870	-	-	-	-	-	-	-	-
Ampharete lindstroemi	P1139	129781	Malmgren, 1867 sensu Hessle, 1917	3	-	7	-	2	-	-	-
Amphicteis midas	P1143	129785	(Gosse, 1855)	-	-	-	-	-	-	-	-
Terebellides	P1174	129717	Sars, 1835	-	-	-	-	-	-	-	-
Loimia ramzega	P1200_G	1036014	Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017	-	-	-	-	-	-	-	-
Nicolea venustula	P1210	131507	(Montagu, 1819)	-	-	-	-	-	-	-	-
Amaeana trilobata	P1229	131471	(Sars, 1863)	-	-	-	-	-	-	-	-
Lysilla loveni	P1233	131500	Malmgren, 1866	-	-	-	-	-	-	-	-
Lysilla nivea	P1234	131501	Langerhans, 1884	-	-	-	-	2	-	-	-
Polycirrus	P1235	129710	Grube, 1850	1	1	-	-	-	-	1	-
Thelepus parapari	P1253_G	1253692	Jirkov, 2018	-	-	-	-	-	-	-	-
Thelepus setosus	P1255	131544	(Quatrefages, 1866)	-	-	-	-	-	-	-	-
Jasmineira elegans	P1290	130921	Saint-Joseph, 1894	-	-	-	-	-	-	-	-
Perkinsiana rubra	P1307	130948	(Langerhans, 1880)	-	-	-	-	-	-	-	-
Pseudopotamilla	P1315	129548	Bush, 1905	-	1	-	-	-	-	-	-
Sabella discifera	P1318	130964	Grube, 1874	-	-	-	-	-	-	-	-
Sabella pavonina	P1320	130967	Savigny, 1822	-	-	-	-	-	-	-	-
Spirobranchus lamarcki	P1340	560033	(Quatrefages, 1866)	1	-	22	24	-	-	-	-
Spirobranchus triqueter	P1341	555935	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Tubificoides	P1487	137393	Lastočkin, 1937	-	-	-	-	-	-	-	-
Grania	P1524	137349	Southern, 1913	-	-	-	-	-	-	-	-
Nymphon brevirostre	Q0005	150520	Hodge, 1863	-	-	-	-	-	-	-	-
Achelia echinata	Q0015	134599	Hodge, 1864	-	-	-	-	-	-	-	-
Ammothella longipes	Q0018	134614	(Hodge, 1864)	-	-	-	-	-	-	-	-
Callipallene	**Q0032**	134581	Flynn, 1929	-	-	-	-	-	-	-	-
Anoplodactylus petiolatus	Q0044	134723	(Krøyer, 1844)	-	-	-	-	1	-	-	-
Verruca stroemia	R0041	106257	(O.F. Müller, 1776)	-	-	-	4	-	-	-	-
Balanus crenatus	R0077	106215	Bruguière, 1789	-	-	-	-	-	-	-	-
OSTRACODA	R2412	1078	Latreille, 1802	-	-	-	-	-	-	-	-
Rissoides desmaresti	S0018	136135	(Risso, 1816)	-	-	-	-	-	-	-	-
Gastrosaccus spinifer	S0044	120020	(Goës, 1864)	-	-	-	-	-	-	-	-
Heteromysis (Heteromysis) microps	S0093	120037	(G.O. Sars, 1877)	-	-	-	-	-	-	-	-
Apherusa ovalipes	S0107	102172	Norman & Scott, 1906	-	-	-	-	-	-	-	-
Apolochus neapolitanus	S0159	236495	(Della Valle, 1893)	-	-	-	-	-	-	-	-
Leucothoe procera	S0179	102466	Spence Bate, 1857	1	-	-	-	-	-	-	-
Stenothoe marina	S0213	103166	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Urothoe brevicornis	S0247	103226	Spence Bate, 1862	-	-	-	-	1	-	-	-
Urothoe elegans	S0248	103228	Spence Bate, 1857	-	-	-	-	-	-	-	-
Urothoe marina	S0249	103233	(Spence Bate, 1857)	-	16	-	-	-	-	-	-
Harpinia pectinata	S0257	102972	Sars, 1891	-	-	-	-	-	-	-	-
Acidostoma neglectum	S0272_A	102495	Dahl, 1964	-	-	1	-	1	-	-	-
Lysianassa ceratina	S0303	102605	(Walker, 1889)	-	-	-	-	-	-	-	-
Iphimedia minuta	S0380	102345	G.O. Sars, 1883	-	-	-	-	4	-	-	-
Iphimedia nexa	S0381	102346	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-	-
Iphimedia spatula	S0384	102351	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-	-
Nototropis guttatus	S0411	488957	Costa, 1853	-	-	-	-	-	-	-	-
Ampelisca diadema	S0429	101896	(Costa, 1853)	-	-	-	-	-	-	-	-
Ampelisca spinipes	S0438	101928	Boeck, 1861	-	-	4	1	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Haploops	S0446	101447	Liljeborg, 1856	-	-	-	-	-	-	-	-
Bathyporeia elegans	S0452	103058	Watkin, 1938	-	-	-	-	-	-	-	-
Bathyporeia guilliamsoniana	S0454	103060	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Bathyporeia pelagica	S0456	103066	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Abludomelita obtusata	S0498	102788	(Montagu, 1813)	-	-	-	-	-	-	-	-
Cheirocratus (female)	S0503	101669	Norman, 1867	-	1	-	-	-	-	-	-
Othomaera othonis	S0519	534781	(H. Milne Edwards, 1830)	-	-	-	-	-	-	-	-
Maerella tenuimana	S0521	102831	(Spence Bate, 1862)	-	1	-	-	-	-	-	-
Megamphopus cornutus	S0539	102377	Norman, 1869	-	-	-	-	-	-	-	-
Gammaropsis maculata	S0541	102364	(Johnston, 1828)	-	-	-	-	-	-	-	-
Photis longicaudata	S0552	102383	(Spence Bate & Westwood, 1862)	-	1	-	-	-	-	-	-
Ericthonius	**S0561**	101567	H. Milne Edwards, 1830	-	-	-	-	1	-	-	-
Jassa	S0568	101571	Leach, 1814	-	-	-	-	-	-	-	-
Microjassa cumbrensis	S0574	102439	(Stebbing & Robertson, 1891)	-	-	-	-	-	-	-	-
Aoridae	**S0577**	101368	Stebbing, 1899	-	1	-	-	-	-	-	-
Crassicorophium crassicorne	S0611	397383	(Bruzelius, 1859)	-	-	-	-	-	-	-	-
Monocorophium sextonae	S0615	148603	(Crawford, 1937)	-	-	-	-	-	-	-	-
Unciola crenatipalma	S0621	102057	(Spence Bate, 1862)	-	-	-	-	-	-	-	-
Dyopedos monacanthus	S0628	489646	(Metzger, 1875)	-	-	1	-	-	-	-	-
Pariambus typicus	S0651	101857	(Krøyer, 1845)	-	-	-	-	-	-	-	-
Phtisica marina	S0657	101864	Slabber, 1769	-	-	-	-	-	-	-	-
Pseudoprotella phasma	S0659	101871	(Montagu, 1804)	-	-	-	-	-	-	-	-
Gnathia oxyuraea	S0796	118995	(Lilljeborg, 1855)	-	-	-	-	-	-	-	-
Anthura gracilis	S0803	118467	(Montagu, 1808)	-	-	-	-	-	-	-	-
Eurydice spinigera	S0855	148637	Hansen, 1890	-	-	-	-	-	-	-	-
Cleantis prismatica	S0947	119038	(Risso, 1826)	-	-	-	-	1	-	-	-
Astacilla longicornis	S0955	119024	(Sowerby, 1806)	-	-	-	-	-	-	-	-
Apseudes talpa	S1177	136285	(Montagu, 1808)	-	-	-	-	-	-	-	-
Bodotria scorpioides	S1197	110445	(Montagu, 1804)	-	-	2	-	-	-	-	-
Diastylis bradyi	S1248	110472	Norman, 1879	-	-	-	-	-	-	-	-
Diastylis rathkei	S1253	110487	(Krøyer, 1841)	-	-	-	-	-	-	-	-
Eualus cranchii	S1360	156083	(Leach, 1817 [in Leach, 1815-1875])	-	-	-	-	-	-	-	-
Axius stirhynchus	S1407	107722	Leach, 1816	-	-	-	-	-	-	-	-
Callianassa subterranea	S1415	107729	(Montagu, 1808)	1	-	-	-	-	-	-	-
Upogebia deltaura	S1419	107739	(Leach, 1816)	-	2	-	-	-	-	-	-
Anapagurus hyndmanni	S1448	107217	(Bell, 1845 [in Bell, 1844-1853])	-	1	-	-	-	-	-	-
Galathea intermedia	S1472	107150	Lilljeborg, 1851	-	-	-	-	-	-	-	-
Pisidia longicornis	S1482	107188	(Linnaeus, 1767)	2	-	-	-	2	-	-	-
Ebalia tuberosa	S1508	107301	(Pennant, 1777)	-	-	-	-	-	-	-	-
Ebalia tumefacta	S1509	107302	(Montagu, 1808)	-	-	-	-	-	-	-	-
Hyas coarctatus	S1519	107323	Leach, 1815 [in Leach, 1815-1875]	-	-	-	-	-	-	-	-
Macropodia rostrata	S1532	107345	(Linnaeus, 1761)	-	-	-	-	-	-	-	-
Atelecyclus rotundatus	S1555	107273	(Olivi, 1792)	-	-	-	-	-	-	-	-
Thia scutellata	S1559	107281	(Fabricius, 1793)	-	-	-	-	-	-	-	-
Pilumnus hirtellus	S1615	107418	(Linnaeus, 1761)	-	-	-	-	-	-	-	-
Leptochiton asellus	W0053	140199	(Gmelin, 1791)	2	1	3	-	-	-	-	-
Puncturella noachina	W0112	139975	(Linnaeus, 1771)	-	-	-	-	-	-	-	-
Steromphala tumida	W0161	1477356	(Montagu, 1803)	-	-	-	-	-	-	-	-
Steromphala cineraria	W0163	1039839	(Linnaeus, 1758)	-	-	1	1	-	-	-	-
Calliostoma zizyphinum	W0182	141767	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Crisilla semistriata	W0348	141280	(Montagu, 1808)	-	-	-	-	-	-	-	-
Caecum glabrum	W0418	138952	(Montagu, 1803)	-	-	-	-	-	-	-	-
Crepidula fornicata	W0439	138963	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Euspira nitida	W0491	151894	(Donovan, 1803)	-	-	-	-	-	-	-	-
Epitonium clathratulum	W0556	139718	(Kanmacher, 1798)	-	-	-	-	-	-	-	-
Ocenebra erinaceus	W0685	140405	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Buccinum undatum	W0708	138878	Linnaeus, 1758	-	-	-	-	-	-	-	-
Brachystomia eulimoides	W0922	491650	(Hanley, 1844)	-	-	-	-	-	-	-	-
Philine quadripartita	W1038_A	574582	Ascanius, 1772	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Duvaucelia	W1245_F	536858	Risso, 1826	-	-	-	-	-	-	-	-
Doto	W1270	137916	Oken, 1815	-	-	-	-	3	2	-	-
Acanthodoris pilosa	W1333	140627	(Abildgaard [in Müller], 1789)	-	-	-	-	-	-	-	-
Nucula hanleyi	W1568	140588	Winckworth, 1931	-	-	-	-	-	-	-	-
Nucula nitidosa	W1569	140589	Winckworth, 1930	-	-	-	-	-	-	-	-
Nucula nucleus	W1570	140590	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Striarca lactea	W1676	140571	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Glycymeris glycymeris	W1688	140025	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Mytilus edulis	W1695	140480	Linnaeus, 1758	-	-	-	-	-	-	-	-
Modiolus adriaticus	W1700	140462	Lamarck, 1819	-	-	-	-	1	-	-	-
Modiolus barbatus	W1701	140464	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Modiolula phaseolina	W1708	140461	(Philippi, 1844)	-	-	-	-	-	-	-	-
Musculus discors	W1721	140472	(Linnaeus, 1767)	-	-	-	-	-	-	-	-
Aequipecten opercularis	W1773	140687	(Linnaeus, 1758)	2	-	-	-	-	-	-	-
Heteranomia squamula	W1809	138749	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Diplodonta rotundata	W1864	141883	(Montagu, 1803)	-	5	-	-	-	-	-	-
Kellia suborbicularis	W1875	140161	(Montagu, 1803)	-	-	-	-	-	-	-	-
Tellimya ferruginosa	W1902	146952	(Montagu, 1808)	-	-	-	-	-	-	-	-
Kurtiella bidentata	W1906	345281	(Montagu, 1803)	7	-	-	-	5	-	-	-
Epilepton clarkiae	W1911	140366	(W. Clark, 1852)	-	-	-	-	-	-	-	-
Goodallia triangularis	W1929	138831	(Montagu, 1803)	-	-	-	-	-	26	-	-
Spisula elliptica	W1975	140300	(T. Brown, 1827)	-	-	-	1	-	-	-	-
Phaxas pellucidus	W2006	140737	(Pennant, 1777)	-	-	-	-	-	-	-	-
Moerella donacina	W2021	147021	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Asbjornsenia pygmaea	W2023	879714	(Lovén, 1846)	-	-	-	-	-	-	-	-
Abra alba	W2059	141433	(W. Wood, 1802)	1	-	-	-	-	-	-	-
Abra prismatica	W2062	141436	(Montagu, 1808)	-	-	-	-	-	-	-	-
Clausinella fasciata	W2100	141909	(da Costa, 1778)	-	-	-	-	-	-	-	-
Timoclea ovata	W2104	141929	(Pennant, 1777)	-	-	-	-	-	-	-	-
Polititapes rhomboides	W2113	745846	(Pennant, 1777)	-	-	-	-	-	-	-	-
Mya truncata	W2147	140431	Linnaeus, 1758	-	-	-	-	-	-	-	-
Sphenia binghami	W2152	140432	W. Turton, 1822	1	-	-	-	-	-	-	-
Varicorbula gibba	W2157	378492	(Olivi, 1792)	-	-	-	-	-	-	-	-
Rocellaria dubia	W2162	505249	(Pennant, 1777)	-	-	-	-	-	-	-	-
Hiatella	W2165	138068	Bosc, 1801	1	-	-	-	-	-	-	-
Saxicavella jeffreysi	W2172	140108	Winckworth, 1930	-	-	-	-	-	-	-	-
Barnea parva	W2183	140768	(Pennant, 1777)	-	-	-	-	-	-	-	-
Thracia villosiuscula	W2233	141651	(MacGillivray, 1827)	-	-	-	-	-	-	-	-
Thracia distorta	W2235	141647	(Montagu, 1803)	-	-	-	-	-	-	-	-
Phoronis	ZA0003	128545	Wright, 1856	5	8	1	1	-	-	-	-
Ophiothrix fragilis	ZB0124	125131	(Abildgaard in O.F. Müller, 1789)	11	-	-	-	-	-	-	-
Acrocnida brachiata	ZB0151	236130	(Montagu, 1804)	-	-	-	-	-	-	-	-
Amphiura filiformis	ZB0154	125080	(O.F. Müller, 1776)	-	-	-	-	-	-	-	-
Amphipholis squamata	ZB0161	125064	(Delle Chiaje, 1828)	-	-	8	1	6	-	-	-
Ophiocten affinis	ZB0167	124850	(Lütken, 1858)	-	-	-	-	-	-	-	-
Ophiura albida	ZB0168	124913	Forbes, 1839	6	3	-	-	-	-	-	-
Ophiura ophiura	ZB0170	124929	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Psammechinus miliaris	ZB0193	124319	(P.L.S. Müller, 1771)	1	-	3	-	2	-	-	-
Echinocyamus pusillus	ZB0212	124273	(O.F. Müller, 1776)	-	-	-	-	1	-	-	-
Echinocardium cordatum	ZB0223	124392	(Pennant, 1777)	-	-	-	-	-	-	-	-
ENTEROPNEUSTA	ZC0012	1820	Gegenbaur, 1870	-	-	1	-	-	-	-	-
ASCIDIACEA	ZD0002	1839	Blainville, 1824	-	1	4	-	-	-	-	-

Number of taxa:	288	288	288	288	288	288	288	288
Abundance:	102	91	124	53	100	52	5	8

The following taxa (highlighted below) are merged in rationalised dataset above

Leiochone	P0951_F	146991	Grube, 1868	-	2	15	5	1	-	-	-
Leiochone tricirrata	P0951_F	328694	Bellan & Reys, 1967	-	-	-	-	1	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Leiochone johnstoni	P0958	221095	McIntosh, 1915	-	-	-	-	-	-	-	-
Leiochone	P0951_F	146991	Grube, 1868	-	2	15	5	2	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-	-
Callipallene tiberii	Q0038	134648	(Dohrn, 1881)	-	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	1	-	-	-
Ericthonius punctatus	S0564	102408	(Spence Bate, 1857)	-	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	1	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	1	-	-	-	-	-	-
Leptocheirus hirsutimanus	S0588	102036	(Spence Bate, 1862)	-	-	-	-	-	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	1	-	-	-	-	-	-
PRESENCE/ABSENCE DATA											
Folliculinidae	A0003	1692	Dons, 1914	-	P	-	-	P	-	P	P
PORIFERA	C0001	558	Grant, 1836	P	P	-	-	-	-	-	-
Cliona agg.	C0475	132026	Grant, 1826	-	-	-	-	-	-	-	-
Raspailiidae	C1258	131642	Nardo, 1833	-	-	-	-	-	-	-	-
Haleciidae	D0389	1608	Hincks, 1868	-	-	-	-	-	-	-	-
Halecium	D0390	117103	Oken, 1815	-	-	-	-	-	-	-	-
Sertulariidae	D0407	1614	Lamouroux, 1812	-	-	-	-	P	-	-	-
Hydrallmania falcata	D0424	117890	(Linnaeus, 1758)	-	P	-	-	-	-	-	-
Sertularella	D0427	117233	Gray, 1848	-	-	-	-	-	-	-	-
Sertularia	D0433	117234	Linnaeus, 1758	-	-	-	-	-	-	-	-
Plumulariidae	D0447	1613	McCrady, 1859	-	-	-	-	-	-	-	-
Nemertesia	D0462	117195	Lamouroux, 1812	-	-	-	-	-	-	-	-
Plumularia setacea	D0469	117824	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Campanulariidae	D0491	1606	Johnston, 1836	-	-	-	-	-	-	-	-
Clytia	D0501	117030	Lamouroux, 1812	-	-	-	-	-	-	-	-
Clytia hemisphaerica	D0503	117368	(Linnaeus, 1767)	-	-	-	-	-	-	-	-
Alcyonium digitatum	D0597	125333	Linnaeus, 1758	P	-	-	-	-	-	-	-
Epizoanthus	D0648	100790	Gray, 1867	-	-	-	-	-	-	-	-
Crisia aculeata	Y0014	111690	Hassall, 1841	-	-	-	-	-	-	-	-
Oncousoecia dilatans	Y0025	111745	(Johnston, 1847)	-	-	-	-	-	-	-	-
Tubuliporidae	Y0026	110814	Johnston, 1837	P	-	-	P	-	-	-	-
Plagioecia patina	Y0041	111719	(Lamarck, 1816)	-	-	-	-	-	-	-	-
Disporella hispida	Y0066	111730	(Fleming, 1828)	P	-	-	-	-	-	-	-
Alcyonidiidae	Y0072	110783	Johnston, 1837	-	-	-	-	-	-	-	-
Alcyonidium	Y0073	110993	J.V.F.Lamouroux, 1813	-	-	-	-	-	-	-	-
Alcyonidium diaphanum	Y0076	111597	(Hudson, 1778)	-	-	-	-	-	-	-	-
Nolella dilatata	Y0092	111632	(Hincks, 1860)	-	-	-	-	-	-	-	-
Vesicularia spinosa	Y0131	111669	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Amathia lendigera	Y0135	111659	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Scruparia ambigua	Y0161	111539	(d'Orbigny, 1841)	-	-	-	-	-	-	-	-
Conopeum reticulum	Y0172	111351	(Linnaeus, 1767)	-	-	-	P	P	-	P	-
Electra monostachys	Y0177	111354	(Busk, 1854)	-	-	-	P	P	-	-	-
Electra pilosa	Y0178	111355	(Linnaeus, 1767)	-	-	-	P	P	-	-	-
Aspidelectra melolontha	Y0182	111350	(Landsborough, 1852)	-	-	-	-	P	-	P	-
Chartella papyracea	Y0192	111365	(Ellis & Solander, 1786)	-	-	-	-	-	-	-	-
Hincksina flustroides	Y0196	111369	(Hincks, 1877)	-	-	-	-	-	-	-	-
Amphiblestrum auritum	Y0222	111186	(Hincks, 1877)	-	-	-	-	-	-	-	-
Crisularia plumosa	Y0246	834039	(Pallas, 1766)	-	-	-	-	-	-	-	-
Bicellariella ciliata	Y0256	111147	(Linnaeus, 1758)	-	-	-	-	-	-	-	-
Puellina	Y0315	110897	Jullien, 1886	-	-	-	-	-	-	-	-
Hippothoa divaricata	Y0332	111399	Lamouroux, 1821	-	-	-	-	-	-	-	-
Chorizopora brongniartii	Y0344	111304	(Audouin, 1826)	-	-	-	-	-	-	-	-
Escharella immersa	Y0364	111484	(Fleming, 1828)	P	P	P	P	P	P	P	-
Escharella variolosa	Y0369	111495	(Johnston, 1838)	-	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
Escharella ventricosa	Y0370	111496	(Hassall, 1842)	-	P	-	-	-	-	-	-
Neolagenipora collaris	Y0376	111509	(Norman, 1867)	-	-	-	-	-	-	-	-
Porella concinna	Y0385	111125	(Busk, 1854)	-	-	-	-	-	-	-	-
Reptadeonella violacea	Y0401	111061	(Johnston, 1847)	-	-	-	-	-	-	-	-
Schizoporella hesperia	Y0427	111528	Hayward & Ryland, 1995	-	-	-	-	-	-	-	-
Escharina johnstoni	Y0440	111518	(Quelch, 1884)	-	-	-	-	-	-	-	-
Schizomavella	Y0467	110829	Canu & Bassler, 1917	P	P	P	P	P	-	P	-
Schizomavella (Schizomavella) linearis	Y0474	862795	(Hassall, 1841)	-	-	-	-	-	-	-	-
Microporella ciliata	Y0480	111421	(Pallas, 1766)	-	-	-	-	-	-	-	-
Fenestrulina	Y0482	110941	Jullien, 1888	-	-	-	-	-	-	-	-
Hagiosynodos latus	Y0520	111391	(Busk, 1856)	-	-	-	-	-	-	-	-
Didemnidae	ZD0041	103439	Giard, 1872	-	-	-	-	-	-	-	-
The following taxa have been removed from the main data matrix to facilitate analysis											
JUVENILES											
SIPUNCULA	N0001	1268	Stephen, 1964	-	4	1	-	-	-	-	-
Aphroditidae	P0017	938	Malmgren, 1867	-	-	-	-	-	-	-	-
Polynoidae	P0025	939	Kinberg, 1856	-	-	-	-	-	-	-	-
Nereididae	P0458	22496	Blainville, 1818	-	-	-	-	-	-	-	-
Nephtys	P0494	129370	Cuvier, 1817	1	-	-	-	1	-	-	-
Lumbrineridae	P0569	967	Schmarda, 1861	-	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-	-
Cirratulidae	P0822	919	Ryckholt, 1851	-	-	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-	-
Ampelisca	S0423	101445	Krøyer, 1842	-	-	-	-	-	-	-	-
AXIIDEA	S1403_A	477324	de Saint Laurent, 1979	-	-	-	-	-	-	-	-
Callianassidae	S1413	106800	Dana, 1852	-	-	-	-	-	-	-	-
Upogebia	S1418	107079	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-	-
Paguridae	S1445	106738	Latreille, 1802	-	-	-	-	1	-	-	-
Ebalia	S1504	106889	Leach, 1817 [in Leach, 1815-1875]	-	-	-	-	-	-	-	-
Macropodia	S1529	205077	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-	-
Cantharidinae	W0140_F	382171	Gray, 1857	-	-	-	-	-	-	-	-
Steromphala	W0162	576164	Gray, 1847	-	-	-	-	-	-	-	-
Buccinidae	W0702	149	Rafinesque, 1815	-	-	-	-	-	-	-	-
NUDIBRANCHIA	W1243	1762	Cuvier, 1817	-	-	-	-	-	-	-	-
Nucula	W1565	138262	Lamarck, 1799	-	2	-	-	-	-	-	-
Mytilidae	W1691	211	Rafinesque, 1815	-	-	-	4	1	4	-	-
Mytilus	W1693	138228	Linnaeus, 1758	-	-	2	-	-	23	-	-
Modiolus	W1698	138223	Lamarck, 1799	-	-	-	-	-	-	-	-
Musculus	W1719	138225	Röding, 1798	-	-	-	-	-	-	-	-
PECTINOIDEA	W1767	151320	Rafinesque, 1815	-	1	-	-	-	-	-	-
Anomiidae	W1805	214	Rafinesque, 1815	2	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	1	-	-	-
Abra	W2058	138474	Lamarck, 1818	3	-	1	-	-	-	-	-
Mya	W2144	138211	Linnaeus, 1758	3	-	-	-	-	-	-	-
Pholadidae	W2174	252	Lamarck, 1809	-	-	-	-	-	-	-	-
Barnea	W2179	138341	Risso, 1826	-	-	-	-	-	-	-	-
THRACIOIDEA	W2225	382318	Stoliczka, 1870 (1839)	-	-	-	-	-	-	-	-
Thracia	W2227	138549	Blainville, 1824	-	-	-	-	-	-	-	-
Pandoridae	W2248	1787	Rafinesque, 1815	-	-	-	-	-	-	-	-
ASTEROIDEA	ZB0018	123080	de Blainville, 1830	-	-	-	-	-	-	-	-
OPHIUROIDEA	ZB0105	123084	Gray, 1840	1	1	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	2	1	7	-	-	-	-	-
ECHINOIDEA	ZB0181	123082	Leske, 1778	-	-	-	-	-	-	-	-
CAMARODONTA	ZB0190	510518	Jackson, 1912	-	-	-	-	-	-	-	-
SPATANGOIDA	ZB0213	123106	L. Agassiz, 1840	-	-	-	-	-	-	-	-
PELAGIC FAUNA											
CHAETOGNATHA	L0001	2081	-	-	-	-	-	-	-	-	-
PARASITIC FAUNA											

Taxon	SDC	AphiaID	Authority	FE5_09FA 1217	FE5_10FA 1218	FE6_01FA 1219	FE6_02FA 1220	FE6_04FA 1221	FE6_06FA 1222	FE6_07FA 1223	FE6_08FA 1224
BOPYROIDEA	S0956	155727	Rafinesque, 1815	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
DAMAGED FAUNA											
Polynoinae	P0025_F	155091	Kinberg, 1856	-	-	1	-	-	-	-	-
Harmothoe	P0050	129491	Kinberg, 1856	-	-	-	-	1	-	-	-
Paucibranchia	P0563_A	1297882	Molina-Acevedo, 2018	1	1	-	-	-	-	-	-
Aonides	P0721	129605	Claparède, 1864	1	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-	-
Dipolydora	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-	-
Maldanidae	P0938	923	Malmgren, 1867	1	2	-	-	-	-	-	-
Euclymeninae	P0951	152232	Arwidsson, 1906	-	-	-	-	-	-	-	-
Nicomachinae	P0976	154920	Arwidsson, 1906	-	1	-	-	-	-	-	-
Scalibregmatidae	P1020	925	Malmgren, 1867	-	-	-	-	-	-	-	-
Owenia	P1097	129427	Delle Chiaje, 1844	-	-	-	-	-	-	-	-
Ampharetidae	P1118	981	Malmgren, 1866	-	-	-	-	-	-	-	-
Ampharetinae	P1125	152252	Malmgren, 1866	-	-	-	-	-	-	-	-
Ampharete	P1133	129155	Malmgren, 1866	1	-	-	-	-	-	-	-
Terebellinae	P1179_A	322588	Johnston, 1846	-	-	-	-	-	-	-	-
POLYCIRRINI	P1227_SF	181512	Malmgren, 1866	-	-	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-	-
Serpulidae	P1324	988	Rafinesque, 1815	-	-	-	-	-	-	-	-
Spirobranchus	P1339	129582	Blainville, 1818	-	-	3	-	1	-	-	-
Urothoe	S0246	101789	Dana, 1852	-	-	-	-	-	-	-	-
Ampeliscidae	S0422	101364	Krøyer, 1842	-	-	-	-	-	-	-	-
Anthuridae	S0801	118244	Leach, 1814	-	-	-	-	-	-	-	-
GASTROPODA	W0088	101	Cuvier, 1795	-	-	-	-	-	-	-	-
Bodotria	S1193	110387	Goodsir, 1843	-	-	-	-	1	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	1	-	-	-	-

SDC = Species Directory Code

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Cerianthus lloydii	D0632	283798	Gosse, 1859	-	-	-	-	-	-	-
ACTINIARIA	D0662	1360	Hertwig, 1882	-	-	-	-	14	4	-
Edwardsiidae	D0759	100665	Andres, 1881	-	-	-	-	-	8	-
PLATYHELMINTHES	F0001	793	Minot, 1876	-	-	-	-	-	-	-
NEMERTEA	G0001	152391	-	-	-	1	2	1	1	6
Loxosoma annelidicola	K0006	111811	(Van Beneden & Hesse, 1863)	-	-	-	-	-	-	-
Golfingia (Golfingia) elongata	N0014	175026	(Keferstein, 1862)	-	-	-	-	-	1	1
Golfingia (Golfingia) vulgaris vulgaris	N0017	410724	(de Blainville, 1827)	-	-	-	-	-	-	-
Maxmuelleria lankesteri	O0018	110368	(Herdman, 1897)	-	-	-	-	4	-	-
Pisione remota	P0015	130707	(Southern, 1914)	-	-	-	-	-	-	-
Subadyte pellucida	P0032	130833	(Ehlers, 1864)	-	-	-	-	-	-	-
Gattyana cirrhosa	P0049	130749	(Pallas, 1766)	-	-	-	-	1	-	-
Malmgrenia Type A	P0050_G@	147006	McIntosh, 1874	-	-	-	-	1	-	-
Malmgrenia bicki	P0050_G@	1044546	Barnich, Dietrich, Hager & Fiege, 2017	-	-	-	-	-	-	-
Malmgrenia arenicolae	P0050_G@	152276	(Saint-Joseph, 1888)	-	-	-	-	-	-	-
Malmgrenia darbouxi	P0050_G@	863197	(Pettibone, 1993)	-	-	-	-	-	-	-
Harmothoe clavigera	P0050_G	130760	(M. Sars, 1863)	-	-	-	-	1	-	1
Malmgrenia andreapolis	P0051	147008	McIntosh, 1874	-	-	-	-	-	-	-
Harmothoe antilopes	P0052	130754	McIntosh, 1876	-	-	-	-	-	-	-
Harmothoe extenuata	P0058	130762	(Grube, 1840)	-	-	-	-	-	-	-
Harmothoe impar	P0065	130770	(Johnston, 1839)	-	-	-	-	-	-	-
Lepidonotus squamatus	P0082	130801	(Linnaeus, 1758)	-	-	-	1	2	5	2
Polynoe scolopendrina	P0084	130830	Savigny, 1822	-	-	-	-	-	-	-
Pholoe inornata	P0092	130601	Johnston, 1839	-	-	1	5	1	3	7
Pholoe baltica	P0095	130599	Örsted, 1843	-	-	1	-	-	-	1
Sthenelais boa	P0107	131074	(Johnston, 1833)	-	-	-	-	-	3	1
Eteone longa agg.	P0118	130616	(Fabricius, 1780)	-	-	1	-	-	-	-
Hesionura elongata	P0122	130649	(Southern, 1914)	-	-	-	-	-	-	-
Mysta barbata	P0126	147027	Malmgren, 1865	-	-	-	-	-	-	-
Mysta picta	P0127	147026	(Quatrefages, 1866)	-	-	-	-	-	-	2
Phyllodoce groenlandica	P0141	334506	Örsted, 1842	-	-	1	-	-	-	-
Phyllodoce lineata	P0142	334508	(Claparède, 1870)	-	-	-	-	-	-	-
Phyllodoce longipes	P0143	130673	Kinberg, 1866	-	-	-	-	-	-	-
Eulalia expusilla	P0153	130625	Pleijel, 1987	-	-	-	-	-	-	-
Eulalia mustela	P0155	130631	Pleijel, 1987	-	-	-	-	-	-	-
Eulalia ornata	P0156	130632	Saint-Joseph, 1888	-	-	-	-	-	1	-
Eumida bahusiensis	P0164	130641	Bergstrom, 1914	-	-	-	-	-	-	-
Eumida sanguinea agg.	P0167	130644	(Örsted, 1843)	-	-	-	-	-	1	-
Glycera alba	P0256	130116	(O.F. Müller, 1776)	-	-	-	-	-	-	1
Glycera lapidum	P0260	130123	Quatrefages, 1866	-	-	-	-	-	-	-
Glycera oxycephala	P0262	130126	Ehlers, 1887	-	-	-	-	-	-	-
Glycinde nordmanni	P0268	130136	(Malmgren, 1866)	-	-	-	-	-	-	-
Goniada maculata	P0271	130140	Örsted, 1843	-	-	-	-	-	-	-
Sphaerodorum gracilis	P0291	131100	(Rathke, 1843)	-	-	-	-	-	-	-
Podarkeopsis capensis	P0319	130195	(Day, 1963)	-	1	-	-	-	-	-
Syllidia armata	P0321	130198	Quatrefages, 1866	-	-	-	-	-	-	-
Syllis garciai	P0351	131431	(Campoy, 1982)	-	-	-	-	-	-	-
Syllis pontxioi	P0358_A	196003	San Martín & López, 2000	-	-	-	-	-	-	-
Syllis armillaris	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Syllis cf. *armillaris*	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Syllis variegata	P0371	131458	Grube, 1860	-	-	-	-	-	-	-
Amblyosyllis spectabilis	P0374_A	1258721	(Johnston in Baird, 1861)	-	-	-	-	-	-	-
Eusyllis blomstrandi	P0380	131290	Malmgren, 1867	-	-	-	-	-	-	-
Odontosyllis fulgurans	P0387	131327	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-
Streptodonta pterochaeta	P0391	238207	(Southern, 1914)	-	-	-	-	-	-	-
Streptosyllis campoyi	P0402_G	238248	Brito, Núñez & San Martín, 2000	-	-	-	-	-	-	-
Syllides japonicus	P0409	131410	Imajima, 1966	-	-	-	-	-	-	-
Parexogone hebes	P0421	757970	(Webster & Benedict, 1884)	-	-	-	3	-	-	-
Exogone naidina	P0422	327985	Örsted, 1845	-	-	-	16	-	-	-

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Exogone verugera	P0423	333456	(Claparède, 1868)	-	-	-	-	-	-	-
Erinaceusyllis erinaceus	P0426	195953	(Claparède, 1863)	-	-	-	3	-	-	-
Sphaerosyllis taylori	P0430	131394	Perkins, 1981	-	-	-	5	-	-	-
Myrianida	P0449	129659	Milne Edwards, 1845	-	-	-	-	1	1	-
Proceraea aurantiaca	P0451_G	131361	Claparède, 1868	-	-	-	-	-	-	-
Rullierinereis ancornunezi	P0458_A	492034	Núñez & Brito, 2006	-	-	-	-	-	3	-
Eunereis longissima	P0475	130375	(Johnston, 1840)	-	-	1	-	-	2	-
Nephtys caeca	P0496	130355	(Fabricius, 1780)	-	-	-	-	-	-	-
Nephtys cirrosa	P0498	130357	Ehlers, 1868	-	1	-	-	-	-	-
Nephtys hombergii	P0499	130359	Savigny in Lamarck, 1818	-	-	7	-	-	-	-
Nephtys kersivalensis	P0502	130363	McIntosh, 1908	-	-	-	4	2	2	-
Nephtys longosetosa	P0503	130364	Örsted, 1842	-	1	-	-	-	-	-
Lysidice ninetta	P0562	130071	Audouin & H Milne Edwards, 1833	-	-	-	-	-	-	-
Paucibranchia totospinata	P0563_B	1305625	(Lu & Fauchald, 1998)	-	-	-	-	-	-	-
Paucibranchia bellii	P0564	1297885	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-
Marphysa sanguinea	P0566	130075	(Montagu, 1813)	-	-	-	-	-	1	-
Lysidice unicornis	P0568	742232	(Grube, 1840)	-	-	-	-	-	-	-
Hilbigneris pleijeli	P0569_F	396540	Carrera-Parra, 2006	-	-	-	2	1	-	1
Lumbrineris cf. *cingulata*	P0572_A	130240	Ehlers, 1897	-	-	-	-	-	1	8
Drilonereis	P0589	129200	Claparède, 1870	-	-	-	-	-	-	-
Protodorvillea kefersteini	P0638	130041	(McIntosh, 1869)	-	-	-	-	-	-	-
Schistomeringos neglecta	P0642	130044	(Fauvel, 1923)	-	-	-	-	-	-	-
Schistomeringos rudolphi	P0643	154127	(Delle Chiaje, 1828)	-	-	-	-	-	-	1
Orbinia sertulata	P0665	130523	(Savigny, 1822)	-	-	-	-	-	-	-
Scoloplos armiger	P0672	130537	(Müller, 1776)	1	-	-	-	-	-	-
Paradoneis lyra	P0699	130585	(Southern, 1914)	-	-	-	-	-	-	-
Poecilochaetus serpens	P0718	130711	Allen, 1904	-	-	-	-	-	-	-
Aonides oxycephala	P0722	131106	(Sars, 1862)	-	-	-	-	2	-	3
Aonides paucibranchiata	P0723	131107	Southern, 1914	-	-	-	-	-	-	-
Atherospio guillei	P0724_A	478336	(Laubier & Ramos, 1974)	-	-	-	-	-	-	-
Laonice irinae	P0731_G	1518242	Sikorski, Radashevsky & Nygren in Sikorski et al, 2021	-	-	-	-	-	-	-
Dipolydora Species A	P0748_A	129611	Verrill, 1881	-	-	-	1	-	-	-
Dipolydora Type N	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	1
Polydora ciliata Type A	P0752	131141	(Johnston, 1838)	-	-	-	-	-	-	-
Dipolydora flava	P0754	131118	(Claparède, 1870)	-	-	-	2	-	4	21
Dipolydora saintjosephi	P0761	131123	(Eliason, 1920)	-	-	-	-	-	-	2
Pseudopolydora pulchra	P0774	131169	(Carazzi, 1893)	-	-	-	1	-	1	-
Pygospio elegans	P0776	131170	Claparède, 1863	-	-	-	-	-	-	-
Scolelepis korsuni	P0777_A	131174	Sikorski, 1994	-	-	-	-	-	-	-
Spio	P0787	129625	Fabricius, 1785	-	-	-	-	-	-	-
Spiophanes bombyx agg.	P0794	131187	(Claparède, 1870)	1	3	3	-	-	-	-
Magelona johnstoni	P0803_A	130269	Fiege, Licher & Mackie, 2000	-	-	-	-	-	-	-
Magelona alleni	P0804	130266	Wilson, 1958	-	-	-	-	-	-	-
Chaetopterus	P0811	129229	Cuvier, 1830	-	-	-	-	-	-	-
Aphelochaeta Type A	P0823	129240	Blake, 1991	-	-	-	-	-	-	-
Aphelochaeta marioni	P0824	129938	(Saint-Joseph, 1894)	-	-	-	-	-	-	-
Caulleriella alata	P0829	129943	(Southern, 1914)	-	-	-	-	-	-	-
Chaetozone zetlandica	P0831	336485	McIntosh, 1911	1	-	-	-	-	-	-
Dodecaceria	P0840	129246	Örsted, 1843	-	-	-	-	-	-	1
Flabelligera affinis	P0881	130103	M. Sars, 1829	-	-	-	-	-	-	-
Pherusa plumosa	P0885	130113	(Müller, 1776)	-	-	-	-	-	2	-
Mediomastus fragilis	P0919	129892	Rasmussen, 1973	-	-	-	26	1	-	7
Notomastus	P0920	129220	M. Sars, 1851	-	-	-	3	-	10	3
Leiochone	**P0951_F**	146991	Grube, 1868	-	-	-	-	-	-	-
Euclymene oerstedii	P0964	130294	(Claparède, 1863)	-	-	-	-	-	-	-
Praxillella affinis	P0971	130322	(M. Sars in G.O. Sars, 1872)	-	-	-	3	-	-	1
Micromaldane ornithochaeta	P0978	130310	Mesnil, 1897	-	-	-	24	-	-	1
Nicomache	P0979	129357	Malmgren, 1865	-	-	-	-	-	-	-
Petaloproctus	P0985	129359	Quatrefages, 1866	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Ophelia borealis	P0999	130491	Quatrefages, 1866	1	-	-	-	-	-	-
Travisia forbesii	P1007	130512	Johnston, 1840	-	-	-	-	-	-	-
Asclerocheilus intermedius	P1022	130974	(Saint-Joseph, 1894)	-	-	-	1	1	-	5
Scalibregma celticum	P1026	130979	Mackie, 1991	-	-	-	1	-	-	-
Scalibregma inflatum	P1027	130980	Rathke, 1843	-	-	-	-	-	-	-
Sclerocheilus minutus	P1029	130982	Grube, 1863	-	-	-	-	-	-	-
Polygordius	P1062	129472	Schneider, 1868	-	-	-	-	-	-	-
Galathowenia oculata	P1093	146950	(Zachs, 1923)	-	-	-	-	-	-	2
Owenia borealis	P1097_G	329882	Koh, Bhaud & Jirkov, 2003	-	-	11	-	-	-	-
Lagis koreni	P1107	152367	Malmgren, 1866	-	-	477	-	-	3	1
Sabellaria spinulosa	P1117	130867	(Leuckart, 1849)	-	-	1	32	-	89	1
Melinna palmata	P1124	129808	Grube, 1870	-	-	-	-	-	-	-
Ampharete lindstroemi	P1139	129781	Malmgren, 1867 sensu Hessle, 1917	-	-	-	6	-	8	7
Amphicteis midas	P1143	129785	(Gosse, 1855)	-	-	-	3	-	6	-
Terebellides	P1174	129717	Sars, 1835	-	-	-	-	-	-	-
Loimia ramzega	P1200_G	1036014	Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017	-	-	-	-	-	-	-
Nicolea venustula	P1210	131507	(Montagu, 1819)	-	-	-	-	-	-	-
Amaeana trilobata	P1229	131471	(Sars, 1863)	-	-	-	-	-	-	-
Lysilla loveni	P1233	131500	Malmgren, 1866	-	-	-	-	-	-	-
Lysilla nivea	P1234	131501	Langerhans, 1884	-	-	-	-	-	-	-
Polycirrus	P1235	129710	Grube, 1850	-	-	-	-	-	-	-
Thelepus parapari	P1253_G	1253692	Jirkov, 2018	-	-	-	-	-	-	-
Thelepus setosus	P1255	131544	(Quatrefages, 1866)	-	-	-	-	-	-	-
Jasmineira elegans	P1290	130921	Saint-Joseph, 1894	-	-	-	-	-	-	-
Perkinsiana rubra	P1307	130948	(Langerhans, 1880)	-	-	-	-	-	-	-
Pseudopotamilla	P1315	129548	Bush, 1905	-	-	-	-	-	-	-
Sabella discifera	P1318	130964	Grube, 1874	-	-	-	-	-	-	-
Sabella pavonina	P1320	130967	Savigny, 1822	-	-	-	-	-	9	-
Spirobranchus lamarcki	P1340	560033	(Quatrefages, 1866)	-	-	-	-	-	6	13
Spirobranchus triqueter	P1341	555935	(Linnaeus, 1758)	-	-	-	-	-	-	-
Tubificoides	P1487	137393	Lastočkin, 1937	-	-	-	59	-	-	-
Grania	P1524	137349	Southern, 1913	-	-	-	-	-	-	-
Nymphon brevirostre	Q0005	150520	Hodge, 1863	-	-	-	-	-	-	-
Achelia echinata	Q0015	134599	Hodge, 1864	-	-	-	-	1	-	-
Ammothella longipes	Q0018	134614	(Hodge, 1864)	-	-	-	-	-	-	-
Callipallene	**Q0032**	134581	Flynn, 1929	-	-	-	-	-	-	-
Anoplodactylus petiolatus	Q0044	134723	(Krøyer, 1844)	-	-	-	-	-	-	-
Verruca stroemia	R0041	106257	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Balanus crenatus	R0077	106215	Bruguière, 1789	-	-	-	-	-	-	-
OSTRACODA	R2412	1078	Latreille, 1802	-	-	-	1	-	-	-
Rissoides desmaresti	S0018	136135	(Risso, 1816)	-	-	-	-	-	-	-
Gastrosaccus spinifer	S0044	120020	(Goës, 1864)	-	-	1	-	-	-	-
Heteromysis (Heteromysis) microps	S0093	120037	(G.O. Sars, 1877)	-	-	-	-	-	-	-
Apherusa ovalipes	S0107	102172	Norman & Scott, 1906	-	-	-	-	-	-	-
Apolochus neapolitanus	S0159	236495	(Della Valle, 1893)	-	-	-	-	-	-	-
Leucothoe procera	S0179	102466	Spence Bate, 1857	-	-	-	-	-	-	-
Stenothoe marina	S0213	103166	(Spence Bate, 1857)	-	-	-	-	-	-	-
Urothoe brevicornis	S0247	103226	Spence Bate, 1862	-	-	-	-	-	-	-
Urothoe elegans	S0248	103228	Spence Bate, 1857	-	-	-	-	-	-	-
Urothoe marina	S0249	103233	(Spence Bate, 1857)	-	-	-	-	-	-	-
Harpinia pectinata	S0257	102972	Sars, 1891	-	-	-	-	-	-	1
Acidostoma neglectum	S0272_A	102495	Dahl, 1964	-	-	-	-	-	-	-
Lysianassa ceratina	S0303	102605	(Walker, 1889)	-	-	-	-	-	-	-
Iphimedia minuta	S0380	102345	G.O. Sars, 1883	-	-	-	-	-	-	1
Iphimedia nexa	S0381	102346	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-
Iphimedia spatula	S0384	102351	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-
Nototropis guttatus	S0411	488957	Costa, 1853	-	-	-	-	-	1	-
Ampelisca diadema	S0429	101896	(Costa, 1853)	-	-	-	21	21	102	16
Ampelisca spinipes	S0438	101928	Boeck, 1861	-	-	-	1	3	-	5

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Haploops	S0446	101447	Liljeborg, 1856	-	-	-	22	6	16	45
Bathyporeia elegans	S0452	103058	Watkin, 1938	-	3	-	-	-	-	-
Bathyporeia guilliamsoniana	S0454	103060	(Spence Bate, 1857)	-	1	-	-	-	-	-
Bathyporeia pelagica	S0456	103066	(Spence Bate, 1857)	-	-	-	-	-	-	-
Abludomelita obtusata	S0498	102788	(Montagu, 1813)	-	-	-	-	-	-	-
Cheirocratus (female)	S0503	101669	Norman, 1867	-	-	-	-	-	-	-
Othomaera othonis	S0519	534781	(H. Milne Edwards, 1830)	-	-	-	-	-	-	-
Maerella tenuimana	S0521	102831	(Spence Bate, 1862)	-	-	-	-	-	-	-
Megamphopus cornutus	S0539	102377	Norman, 1869	-	-	-	-	-	-	-
Gammaropsis maculata	S0541	102364	(Johnston, 1828)	-	-	-	-	-	-	-
Photis longicaudata	S0552	102383	(Spence Bate & Westwood, 1862)	-	-	-	-	-	-	7
Ericthonius	**S0561**	101567	H. Milne Edwards, 1830	-	-	-	-	2	1	-
Jassa	S0568	101571	Leach, 1814	-	-	-	-	-	-	-
Microjassa cumbrensis	S0574	102439	(Stebbing & Robertson, 1891)	-	-	-	-	-	-	-
Aoridae	**S0577**	101368	Stebbing, 1899	-	-	-	-	-	-	-
Crassicorophium crassicorne	S0611	397383	(Bruzelius, 1859)	-	-	-	-	-	-	2
Monocorophium sextonae	S0615	148603	(Crawford, 1937)	-	-	-	-	-	-	-
Unciola crenatipalma	S0621	102057	(Spence Bate, 1862)	-	-	-	-	-	6	-
Dyopedos monacanthus	S0628	489646	(Metzger, 1875)	-	-	-	-	-	-	-
Pariambus typicus	S0651	101857	(Krøyer, 1845)	-	-	-	-	-	-	-
Phtisica marina	S0657	101864	Slabber, 1769	-	-	-	-	-	-	-
Pseudoprotella phasma	S0659	101871	(Montagu, 1804)	-	-	-	-	-	-	-
Gnathia oxyuraea	S0796	118995	(Lilljeborg, 1855)	-	-	-	-	-	-	-
Anthura gracilis	S0803	118467	(Montagu, 1808)	-	-	-	-	-	-	1
Eurydice spinigera	S0855	148637	Hansen, 1890	-	-	-	-	-	-	-
Cleantis prismatica	S0947	119038	(Risso, 1826)	-	-	-	-	-	-	-
Astacilla longicornis	S0955	119024	(Sowerby, 1806)	-	-	-	-	-	-	-
Apseudes talpa	S1177	136285	(Montagu, 1808)	-	-	-	-	-	-	-
Bodotria scorpioides	S1197	110445	(Montagu, 1804)	-	-	-	-	-	-	1
Diastylis bradyi	S1248	110472	Norman, 1879	-	1	-	-	-	-	-
Diastylis rathkei	S1253	110487	(Krøyer, 1841)	-	-	-	-	-	-	-
Eualus cranchii	S1360	156083	(Leach, 1817 [in Leach, 1815-1875])	-	-	-	-	-	-	-
Axius stirhynchus	S1407	107722	Leach, 1816	-	-	-	-	-	-	-
Callianassa subterranea	S1415	107729	(Montagu, 1808)	-	-	-	-	-	-	-
Upogebia deltaura	S1419	107739	(Leach, 1816)	-	-	-	-	-	-	-
Anapagurus hyndmanni	S1448	107217	(Bell, 1845 [in Bell, 1844-1853])	-	-	-	-	-	-	-
Galathea intermedia	S1472	107150	Lilljeborg, 1851	-	-	-	-	-	-	-
Pisidia longicornis	S1482	107188	(Linnaeus, 1767)	-	-	-	-	-	2	-
Ebalia tuberosa	S1508	107301	(Pennant, 1777)	-	-	-	-	-	-	-
Ebalia tumefacta	S1509	107302	(Montagu, 1808)	-	-	-	-	-	-	-
Hyas coarctatus	S1519	107323	Leach, 1815 [in Leach, 1815-1875]	-	-	-	-	-	1	-
Macropodia rostrata	S1532	107345	(Linnaeus, 1761)	-	-	-	-	-	1	-
Atelecyclus rotundatus	S1555	107273	(Olivi, 1792)	-	-	-	-	-	-	-
Thia scutellata	S1559	107281	(Fabricius, 1793)	-	-	-	-	-	-	-
Pilumnus hirtellus	S1615	107418	(Linnaeus, 1761)	-	-	-	-	-	-	-
Leptochiton asellus	W0053	140199	(Gmelin, 1791)	-	-	-	-	-	-	-
Puncturella noachina	W0112	139975	(Linnaeus, 1771)	-	-	-	-	-	-	-
Steromphala tumida	W0161	1477356	(Montagu, 1803)	-	-	-	-	-	-	-
Steromphala cineraria	W0163	1039839	(Linnaeus, 1758)	-	-	-	-	-	-	2
Calliostoma zizyphinum	W0182	141767	(Linnaeus, 1758)	-	-	-	-	-	-	-
Crisilla semistriata	W0348	141280	(Montagu, 1808)	-	-	-	-	-	-	-
Caecum glabrum	W0418	138952	(Montagu, 1803)	-	-	-	-	-	-	-
Crepidula fornicata	W0439	138963	(Linnaeus, 1758)	-	-	-	-	-	-	-
Euspira nitida	W0491	151894	(Donovan, 1803)	-	-	1	-	-	-	-
Epitonium clathratulum	W0556	139718	(Kanmacher, 1798)	-	-	-	-	-	1	-
Ocenebra erinaceus	W0685	140405	(Linnaeus, 1758)	-	-	-	2	1	1	-
Buccinum undatum	W0708	138878	Linnaeus, 1758	-	-	-	2	-	3	-
Brachystomia eulimoides	W0922	491650	(Hanley, 1844)	-	-	-	1	-	-	-
Philine quadripartita	W1038_A	574582	Ascanius, 1772	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Duvaucelia	W1245_F	536858	Risso, 1826	-	-	-	-	-	-	-
Doto	W1270	137916	Oken, 1815	-	-	-	-	-	-	-
Acanthodoris pilosa	W1333	140627	(Abildgaard [in Müller], 1789)	-	-	-	-	-	-	-
Nucula hanleyi	W1568	140588	Winckworth, 1931	-	-	-	-	-	-	-
Nucula nitidosa	W1569	140589	Winckworth, 1930	-	-	-	-	-	-	-
Nucula nucleus	W1570	140590	(Linnaeus, 1758)	-	-	-	89	142	10	-
Striarca lactea	W1676	140571	(Linnaeus, 1758)	-	-	-	-	-	-	-
Glycymeris glycymeris	W1688	140025	(Linnaeus, 1758)	-	-	-	-	-	-	-
Mytilus edulis	W1695	140480	Linnaeus, 1758	-	-	-	3	-	-	-
Modiolus adriaticus	W1700	140462	Lamarck, 1819	-	-	-	-	-	-	1
Modiolus barbatus	W1701	140464	(Linnaeus, 1758)	-	-	-	-	-	-	-
Modiolula phaseolina	W1708	140461	(Philippi, 1844)	-	-	-	-	-	-	-
Musculus discors	W1721	140472	(Linnaeus, 1767)	-	-	-	1376	6	-	-
Aequipecten opercularis	W1773	140687	(Linnaeus, 1758)	-	-	-	-	-	-	-
Heteranomia squamula	W1809	138749	(Linnaeus, 1758)	-	-	-	-	-	-	-
Diplodonta rotundata	W1864	141883	(Montagu, 1803)	-	-	-	-	-	-	-
Kellia suborbicularis	W1875	140161	(Montagu, 1803)	-	-	-	-	-	-	-
Tellimya ferruginosa	W1902	146952	(Montagu, 1808)	-	-	-	-	-	-	-
Kurtiella bidentata	W1906	345281	(Montagu, 1803)	-	-	23	-	21	-	-
Epilepton clarkiae	W1911	140366	(W. Clark, 1852)	-	-	-	-	-	-	-
Goodallia triangularis	W1929	138831	(Montagu, 1803)	-	-	-	-	-	-	-
Spisula elliptica	W1975	140300	(T. Brown, 1827)	-	-	-	-	-	-	-
Phaxas pellucidus	W2006	140737	(Pennant, 1777)	-	-	1	-	-	-	-
Moerella donacina	W2021	147021	(Linnaeus, 1758)	-	-	-	-	-	-	-
Asbjornsenia pygmaea	W2023	879714	(Lovén, 1846)	-	-	-	-	-	-	-
Abra alba	W2059	141433	(W. Wood, 1802)	-	-	1	5	2	-	1
Abra prismatica	W2062	141436	(Montagu, 1808)	-	-	-	-	-	-	-
Clausinella fasciata	W2100	141909	(da Costa, 1778)	-	-	-	-	-	-	-
Timoclea ovata	W2104	141929	(Pennant, 1777)	-	-	-	-	-	-	-
Polititapes rhomboides	W2113	745846	(Pennant, 1777)	-	-	-	-	-	-	-
Mya truncata	W2147	140431	Linnaeus, 1758	-	-	-	-	1	-	-
Sphenia binghami	W2152	140432	W. Turton, 1822	-	-	-	1	1	6	2
Varicorbula gibba	W2157	378492	(Olivi, 1792)	-	-	-	-	-	-	1
Rocellaria dubia	W2162	505249	(Pennant, 1777)	-	-	-	-	-	-	-
Hiatella	W2165	138068	Bosc, 1801	-	-	-	-	-	-	-
Saxicavella jeffreysi	W2172	140108	Winckworth, 1930	-	-	-	-	22	-	-
Barnea parva	W2183	140768	(Pennant, 1777)	-	-	-	-	-	-	-
Thracia villosiuscula	W2233	141651	(MacGillivray, 1827)	-	-	-	-	-	-	-
Thracia distorta	W2235	141647	(Montagu, 1803)	-	-	-	-	-	-	-
Phoronis	ZA0003	128545	Wright, 1856	-	-	-	-	-	1	6
Ophiothrix fragilis	ZB0124	125131	(Abildgaard in O.F. Müller, 1789)	-	-	-	-	-	-	-
Acrocnida brachiata	ZB0151	236130	(Montagu, 1804)	-	-	-	-	-	-	-
Amphiura filiformis	ZB0154	125080	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Amphipholis squamata	ZB0161	125064	(Delle Chiaje, 1828)	-	-	-	12	2	6	13
Ophiocten affinis	ZB0167	124850	(Lütken, 1858)	-	-	-	-	-	-	-
Ophiura albida	ZB0168	124913	Forbes, 1839	-	2	5	-	-	-	10
Ophiura ophiura	ZB0170	124929	(Linnaeus, 1758)	-	-	1	-	-	-	-
Psammechinus miliaris	ZB0193	124319	(P.L.S. Müller, 1771)	-	-	-	-	-	-	1
Echinocyamus pusillus	ZB0212	124273	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Echinocardium cordatum	ZB0223	124392	(Pennant, 1777)	-	-	-	-	-	-	-
ENTEROPNEUSTA	ZC0012	1820	Gegenbaur, 1870	-	-	-	-	-	-	-
ASCIDIACEA	ZD0002	1839	Blainville, 1824	-	-	-	-	-	11	-

Number of taxa:	288	288	288	288	288	288	288
Abundance:	4	13	538	1739	264	344	217

The following taxa (highlighted below) are merged in rationalised dataset above

Leiochone	P0951_F	146991	Grube, 1868	-	-	-	-	-	-	-
Leiochone tricirrata	P0951_F	328694	Bellan & Reys, 1967	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Leiochone johnstoni	P0958	221095	McIntosh, 1915	-	-	-	-	-	-	-
Leiochone	P0951_F	146991	Grube, 1868	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-
Callipallene tiberii	Q0038	134648	(Dohrn, 1881)	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	2	-	-
Ericthonius punctatus	S0564	102408	(Spence Bate, 1857)	-	-	-	-	-	1	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	2	1	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-	-
Leptocheirus hirsutimanus	S0588	102036	(Spence Bate, 1862)	-	-	-	-	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-	-
PRESENCE/ABSENCE DATA										
Folliculinidae	A0003	1692	Dons, 1914	-	-	-	-	-	-	P
PORIFERA	C0001	558	Grant, 1836	-	-	-	-	-	-	-
Cliona agg.	C0475	132026	Grant, 1826	-	-	-	-	-	-	-
Raspailiidae	C1258	131642	Nardo, 1833	-	-	-	-	-	-	-
Haleciidae	D0389	1608	Hincks, 1868	-	-	-	-	-	-	-
Halecium	D0390	117103	Oken, 1815	-	-	-	-	-	-	-
Sertulariidae	D0407	1614	Lamouroux, 1812	-	-	-	-	-	-	-
Hydrallmania falcata	D0424	117890	(Linnaeus, 1758)	-	-	-	-	-	-	-
Sertularella	D0427	117233	Gray, 1848	-	-	-	-	-	-	-
Sertularia	D0433	117234	Linnaeus, 1758	-	-	-	-	-	-	-
Plumulariidae	D0447	1613	McCrady, 1859	-	-	-	-	-	-	-
Nemertesia	D0462	117195	Lamouroux, 1812	-	-	-	-	-	-	-
Plumularia setacea	D0469	117824	(Linnaeus, 1758)	-	-	-	-	-	-	-
Campanulariidae	D0491	1606	Johnston, 1836	-	-	-	-	-	-	-
Clytia	D0501	117030	Lamouroux, 1812	-	-	-	-	-	-	-
Clytia hemisphaerica	D0503	117368	(Linnaeus, 1767)	-	-	-	-	-	-	-
Alcyonium digitatum	D0597	125333	Linnaeus, 1758	-	-	-	-	-	-	-
Epizoanthus	D0648	100790	Gray, 1867	-	-	-	-	-	-	-
Crisia aculeata	Y0014	111690	Hassall, 1841	-	-	-	-	-	-	-
Oncousoecia dilatans	Y0025	111745	(Johnston, 1847)	-	-	-	-	-	-	-
Tubuliporidae	Y0026	110814	Johnston, 1837	-	-	-	-	-	-	-
Plagioecia patina	Y0041	111719	(Lamarck, 1816)	-	-	-	-	-	-	-
Disporella hispida	Y0066	111730	(Fleming, 1828)	-	-	-	-	-	-	-
Alcyonidiidae	Y0072	110783	Johnston, 1837	-	-	-	-	-	-	-
Alcyonidium	Y0073	110993	J.V.F.Lamouroux, 1813	-	-	-	-	-	-	-
Alcyonidium diaphanum	Y0076	111597	(Hudson, 1778)	-	-	-	-	-	P	-
Nolella dilatata	Y0092	111632	(Hincks, 1860)	-	-	-	-	-	-	-
Vesicularia spinosa	Y0131	111669	(Linnaeus, 1758)	-	-	-	-	P	P	-
Amathia lendigera	Y0135	111659	(Linnaeus, 1758)	-	-	-	-	-	-	-
Scruparia ambigua	Y0161	111539	(d'Orbigny, 1841)	-	-	-	-	-	-	-
Conopeum reticulum	Y0172	111351	(Linnaeus, 1767)	P	-	P	P	P	P	-
Electra monostachys	Y0177	111354	(Busk, 1854)	-	-	-	P	P	-	-
Electra pilosa	Y0178	111355	(Linnaeus, 1767)	-	-	-	-	-	P	-
Aspidelectra melolontha	Y0182	111350	(Landsborough, 1852)	P	P	P	P	P	P	P
Chartella papyracea	Y0192	111365	(Ellis & Solander, 1786)	-	-	-	-	-	-	-
Hincksina flustroides	Y0196	111369	(Hincks, 1877)	-	-	-	-	-	-	-
Amphiblestrum auritum	Y0222	111186	(Hincks, 1877)	-	-	-	-	-	P	-
Crisularia plumosa	Y0246	834039	(Pallas, 1766)	-	-	-	-	-	-	-
Bicellariella ciliata	Y0256	111147	(Linnaeus, 1758)	-	-	-	-	-	-	-
Puellina	Y0315	110897	Jullien, 1886	-	-	-	-	-	-	-
Hippothoa divaricata	Y0332	111399	Lamouroux, 1821	-	-	-	-	-	-	-
Chorizopora brongniartii	Y0344	111304	(Audouin, 1826)	-	-	-	-	-	-	-
Escharella immersa	Y0364	111484	(Fleming, 1828)	-	-	-	-	-	P	P
Escharella variolosa	Y0369	111495	(Johnston, 1838)	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
Escharella ventricosa	Y0370	111496	(Hassall, 1842)	-	-	-	-	-	-	-
Neolagenipora collaris	Y0376	111509	(Norman, 1867)	-	-	-	-	-	-	-
Porella concinna	Y0385	111125	(Busk, 1854)	-	-	-	-	-	-	-
Reptadeonella violacea	Y0401	111061	(Johnston, 1847)	-	-	-	-	-	-	-
Schizoporella hesperia	Y0427	111528	Hayward & Ryland, 1995	-	-	-	-	-	-	-
Escharina johnstoni	Y0440	111518	(Quelch, 1884)	-	-	-	-	-	-	-
Schizomavella	Y0467	110829	Canu & Bassler, 1917	-	-	-	-	-	P	P
Schizomavella (Schizomavella) linearis	Y0474	862795	(Hassall, 1841)	-	-	-	-	-	-	-
Microporella ciliata	Y0480	111421	(Pallas, 1766)	-	-	-	-	-	-	-
Fenestrulina	Y0482	110941	Jullien, 1888	-	-	-	-	-	-	-
Hagiosynodos latus	Y0520	111391	(Busk, 1856)	-	-	-	-	-	-	-
Didemnidae	ZD0041	103439	Giard, 1872	-	-	-	-	-	-	-
The following taxa have been removed from the main data matrix to facilitate analysis										
JUVENILES										
SIPUNCULA	N0001	1268	Stephen, 1964	-	-	-	-	-	-	-
Aphroditidae	P0017	938	Malmgren, 1867	-	-	-	-	-	-	-
Polynoidae	P0025	939	Kinberg, 1856	-	-	-	-	-	-	-
Nereididae	P0458	22496	Blainville, 1818	-	-	-	-	-	-	-
Nephtys	P0494	129370	Cuvier, 1817	-	-	-	-	-	1	2
Lumbrineridae	P0569	967	Schmarda, 1861	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-
Cirratulidae	P0822	919	Ryckholt, 1851	-	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	1
Ampelisca	S0423	101445	Krøyer, 1842	-	-	-	-	-	-	-
AXIIDEA	S1403_A	477324	de Saint Laurent, 1979	-	-	-	-	-	-	-
Callianassidae	S1413	106800	Dana, 1852	-	-	-	-	-	-	-
Upogebia	S1418	107079	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-
Paguridae	S1445	106738	Latreille, 1802	-	-	-	-	-	-	-
Ebalia	S1504	106889	Leach, 1817 [in Leach, 1815-1875]	-	-	-	-	-	-	-
Macropodia	S1529	205077	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-
Cantharidinae	W0140_F	382171	Gray, 1857	-	-	-	-	-	-	-
Steromphala	W0162	576164	Gray, 1847	-	-	-	-	1	-	-
Buccinidae	W0702	149	Rafinesque, 1815	-	-	-	-	-	1	-
NUDIBRANCHIA	W1243	1762	Cuvier, 1817	-	-	-	-	-	-	-
Nucula	W1565	138262	Lamarck, 1799	-	-	-	10	19	11	-
Mytilidae	W1691	211	Rafinesque, 1815	-	-	-	5	1	-	1
Mytilus	W1693	138228	Linnaeus, 1758	-	-	2	1	-	-	-
Modiolus	W1698	138223	Lamarck, 1799	-	-	-	-	-	-	-
Musculus	W1719	138225	Röding, 1798	-	-	-	-	-	1	-
PECTINOIDEA	W1767	151320	Rafinesque, 1815	-	-	-	-	-	-	-
Anomiidae	W1805	214	Rafinesque, 1815	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	1	-	-	2
Mya	W2144	138211	Linnaeus, 1758	-	-	-	-	-	-	-
Pholadidae	W2174	252	Lamarck, 1809	-	-	-	-	1	-	-
Barnea	W2179	138341	Risso, 1826	-	-	-	-	-	-	-
THRACIOIDEA	W2225	382318	Stoliczka, 1870 (1839)	-	-	-	-	-	-	-
Thracia	W2227	138549	Blainville, 1824	-	-	-	-	-	-	-
Pandoridae	W2248	1787	Rafinesque, 1815	-	-	-	-	-	1	-
ASTEROIDEA	ZB0018	123080	de Blainville, 1830	-	-	-	-	-	-	-
OPHIUROIDEA	ZB0105	123084	Gray, 1840	-	-	-	1	-	-	2
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-	-
ECHINOIDEA	ZB0181	123082	Leske, 1778	-	-	-	-	-	-	-
CAMARODONTA	ZB0190	510518	Jackson, 1912	-	-	-	-	-	-	-
SPATANGOIDA	ZB0213	123106	L. Agassiz, 1840	-	-	-	-	-	-	-
PELAGIC FAUNA										
CHAETOGNATHA	L0001	2081	-	-	-	-	-	-	-	-
PARASITIC FAUNA										

Taxon	SDC	AphiaID	Authority	FE6_09FA 1225	FE6_10FA 1226	FE6_11FA 1227	FE7b_02FA 1228	FE7b_04FA 1229	FE7b_05FA 1230	FE7b_06FA 1231
BOPYROIDEA	S0956	155727	Rafinesque, 1815	-	-	-	-	-	-	-
DAMAGED FAUNA										
Polynoinae	P0025_F	155091	Kinberg, 1856	-	-	-	-	-	-	-
Harmothoe	P0050	129491	Kinberg, 1856	-	-	-	-	-	-	-
Paucibranchia	P0563_A	1297882	Molina-Acevedo, 2018	-	-	-	-	-	-	-
Aonides	P0721	129605	Claparède, 1864	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-
Dipolydora	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	5
Maldanidae	P0938	923	Malmgren, 1867	-	-	-	-	-	-	-
Euclymeninae	P0951	152232	Arwidsson, 1906	-	-	-	-	-	-	-
Nicomachinae	P0976	154920	Arwidsson, 1906	-	-	-	-	-	-	-
Scalibregmatidae	P1020	925	Malmgren, 1867	-	-	-	-	-	-	1
Owenia	P1097	129427	Delle Chiaje, 1844	-	-	-	-	-	-	-
Ampharetidae	P1118	981	Malmgren, 1866	-	-	-	-	-	-	-
Ampharetinae	P1125	152252	Malmgren, 1866	-	-	-	-	-	-	-
Ampharete	P1133	129155	Malmgren, 1866	-	-	-	-	-	-	-
Terebellinae	P1179_A	322588	Johnston, 1846	-	-	-	-	-	-	-
POLYCIRRINI	P1227_SF	181512	Malmgren, 1866	-	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-
Serpulidae	P1324	988	Rafinesque, 1815	-	-	-	-	-	10	5
Spirobranchus	P1339	129582	Blainville, 1818	-	-	-	-	-	-	-
Urothoe	S0246	101789	Dana, 1852	-	-	-	-	-	-	-
Ampeliscidae	S0422	101364	Krøyer, 1842	-	-	-	-	-	-	-
Anthuridae	S0801	118244	Leach, 1814	-	-	-	-	-	-	-
GASTROPODA	W0088	101	Cuvier, 1795	-	-	-	-	-	-	-
Bodotria	S1193	110387	Goodsir, 1843	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-	-

SDC = Species Directory Code

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Cerianthus lloydii	D0632	283798	Gosse, 1859	-	2	-	-	-	-	-
ACTINIARIA	D0662	1360	Hertwig, 1882	24	-	-	-	12	20	4
Edwardsiidae	D0759	100665	Andres, 1881	-	1	3	-	-	-	-
PLATYHELMINTHES	F0001	793	Minot, 1876	-	-	-	-	-	1	-
NEMERTEA	G0001	152391	-	-	5	5	-	1	-	3
Loxosoma annelidicola	K0006	111811	(Van Beneden & Hesse, 1863)	-	-	-	-	-	-	-
Golfingia (Golfingia) elongata	N0014	175026	(Keferstein, 1862)	1	2	1	-	2	-	2
Golfingia (Golfingia) vulgaris vulgaris	N0017	410724	(de Blainville, 1827)	-	1	-	-	-	-	-
Maxmuelleria lankesteri	O0018	110368	(Herdman, 1897)	-	-	-	-	-	-	-
Pisione remota	P0015	130707	(Southern, 1914)	-	-	-	-	-	-	-
Subadyte pellucida	P0032	130833	(Ehlers, 1864)	-	-	-	-	-	-	-
Gattyana cirrhosa	P0049	130749	(Pallas, 1766)	-	-	-	-	-	-	-
Malmgrenia Type A	P0050_G@	147006	McIntosh, 1874	-	-	-	-	-	-	-
Malmgrenia bicki	P0050_G@	1044546	Barnich, Dietrich, Hager & Fiege, 2017	-	-	-	-	-	-	-
Malmgrenia arenicolae	P0050_G@	152276	(Saint-Joseph, 1888)	-	-	-	-	-	-	-
Malmgrenia darbouxi	P0050_G@	863197	(Pettibone, 1993)	-	-	-	-	-	-	-
Harmothoe clavigera	P0050_G	130760	(M. Sars, 1863)	-	-	-	-	-	-	-
Malmgrenia andreapolis	P0051	147008	McIntosh, 1874	-	-	-	-	-	-	-
Harmothoe antilopes	P0052	130754	McIntosh, 1876	-	-	-	-	-	1	-
Harmothoe extenuata	P0058	130762	(Grube, 1840)	-	-	-	-	-	-	-
Harmothoe impar	P0065	130770	(Johnston, 1839)	-	-	-	-	-	-	-
Lepidonotus squamatus	P0082	130801	(Linnaeus, 1758)	-	-	1	-	-	-	-
Polynoe scolopendrina	P0084	130830	Savigny, 1822	-	-	-	-	-	-	-
Pholoe inornata	P0092	130601	Johnston, 1839	1	-	2	-	1	2	1
Pholoe baltica	P0095	130599	Örsted, 1843	-	1	-	-	-	-	1
Sthenelais boa	P0107	131074	(Johnston, 1833)	1	-	-	-	-	2	1
Eteone longa agg.	P0118	130616	(Fabricius, 1780)	-	-	-	-	1	-	-
Hesionura elongata	P0122	130649	(Southern, 1914)	-	-	-	-	-	-	-
Mysta barbata	P0126	147027	Malmgren, 1865	-	-	-	-	-	-	-
Mysta picta	P0127	147026	(Quatrefages, 1866)	-	-	-	-	-	-	-
Phyllodoce groenlandica	P0141	334506	Örsted, 1842	-	-	-	-	-	-	-
Phyllodoce lineata	P0142	334508	(Claparède, 1870)	-	-	-	-	-	-	-
Phyllodoce longipes	P0143	130673	Kinberg, 1866	-	-	-	-	-	-	-
Eulalia expusilla	P0153	130625	Pleijel, 1987	1	-	-	-	-	-	-
Eulalia mustela	P0155	130631	Pleijel, 1987	-	-	-	-	-	-	-
Eulalia ornata	P0156	130632	Saint-Joseph, 1888	-	-	-	-	-	-	-
Eumida bahusiensis	P0164	130641	Bergstrom, 1914	-	-	-	-	-	-	1
Eumida sanguinea agg.	P0167	130644	(Örsted, 1843)	-	-	-	-	-	-	-
Glycera alba	P0256	130116	(O.F. Müller, 1776)	-	-	-	-	1	-	-
Glycera lapidum	P0260	130123	Quatrefages, 1866	-	-	-	-	-	2	-
Glycera oxycephala	P0262	130126	Ehlers, 1887	-	-	-	-	-	-	-
Glycinde nordmanni	P0268	130136	(Malmgren, 1866)	-	-	-	-	-	-	-
Goniada maculata	P0271	130140	Örsted, 1843	-	1	1	-	-	-	2
Sphaerodorum gracilis	P0291	131100	(Rathke, 1843)	-	-	-	-	-	-	-
Podarkeopsis capensis	P0319	130195	(Day, 1963)	-	-	-	-	-	-	-
Syllidia armata	P0321	130198	Quatrefages, 1866	-	-	-	-	-	-	-
Syllis garciai	P0351	131431	(Campoy, 1982)	-	-	-	-	-	-	-
Syllis pontxioi	P0358_A	196003	San Martín & López, 2000	-	-	-	-	-	-	-
Syllis armillaris	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Syllis cf. *armillaris*	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Syllis variegata	P0371	131458	Grube, 1860	-	-	-	-	-	-	-
Amblyosyllis spectabilis	P0374_A	1258721	(Johnston in Baird, 1861)	-	-	-	-	-	-	-
Eusyllis blomstrandi	P0380	131290	Malmgren, 1867	-	-	-	-	-	-	-
Odontosyllis fulgurans	P0387	131327	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-
Streptodonta pterochaeta	P0391	238207	(Southern, 1914)	-	-	-	-	-	-	-
Streptosyllis campoyi	P0402_G	238248	Brito, Núñez & San Martín, 2000	-	-	-	-	-	-	-
Syllides japonicus	P0409	131410	Imajima, 1966	-	-	-	-	-	-	-
Parexogone hebes	P0421	757970	(Webster & Benedict, 1884)	-	-	-	-	-	-	-
Exogone naidina	P0422	327985	Örsted, 1845	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Exogone verugera	P0423	333456	(Claparède, 1868)	-	-	-	-	-	-	-
Erinaceusyllis erinaceus	P0426	195953	(Claparède, 1863)	-	-	-	-	-	-	-
Sphaerosyllis taylori	P0430	131394	Perkins, 1981	-	-	-	-	-	-	-
Myrianida	P0449	129659	Milne Edwards, 1845	-	-	-	-	-	-	-
Proceraea aurantiaca	P0451_G	131361	Claparède, 1868	-	-	-	-	-	-	-
Rullierinereis ancornunezi	P0458_A	492034	Núñez & Brito, 2006	-	-	-	-	-	-	-
Eunereis longissima	P0475	130375	(Johnston, 1840)	1	-	-	-	-	-	-
Nephtys caeca	P0496	130355	(Fabricius, 1780)	-	-	-	-	-	-	-
Nephtys cirrosa	P0498	130357	Ehlers, 1868	-	-	-	-	-	-	-
Nephtys hombergii	P0499	130359	Savigny in Lamarck, 1818	-	-	-	3	-	-	-
Nephtys kersivalensis	P0502	130363	McIntosh, 1908	-	-	1	-	-	-	1
Nephtys longosetosa	P0503	130364	Örsted, 1842	-	-	-	-	-	-	-
Lysidice ninetta	P0562	130071	Audouin & H Milne Edwards, 1833	-	-	-	-	-	-	-
Paucibranchia totospinata	P0563_B	1305625	(Lu & Fauchald, 1998)	-	-	-	-	-	-	-
Paucibranchia bellii	P0564	1297885	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-	-
Marphysa sanguinea	P0566	130075	(Montagu, 1813)	-	-	-	-	-	-	-
Lysidice unicornis	P0568	742232	(Grube, 1840)	-	-	-	-	-	-	-
Hilbigneris pleijeli	P0569_F	396540	Carrera-Parra, 2006	-	-	-	-	-	-	-
Lumbrineris cf. *cingulata*	P0572_A	130240	Ehlers, 1897	8	2	5	-	4	2	2
Drilonereis	P0589	129200	Claparède, 1870	-	-	-	-	-	-	-
Protodorvillea kefersteini	P0638	130041	(McIntosh, 1869)	-	-	1	-	-	-	-
Schistomeringos neglecta	P0642	130044	(Fauvel, 1923)	-	-	-	-	-	-	-
Schistomeringos rudolphi	P0643	154127	(Delle Chiaje, 1828)	-	-	-	-	-	-	-
Orbinia sertulata	P0665	130523	(Savigny, 1822)	-	-	-	-	-	-	-
Scoloplos armiger	P0672	130537	(Müller, 1776)	-	-	-	-	-	-	-
Paradoneis lyra	P0699	130585	(Southern, 1914)	-	-	-	-	-	-	-
Poecilochaetus serpens	P0718	130711	Allen, 1904	-	-	-	-	-	-	-
Aonides oxycephala	P0722	131106	(Sars, 1862)	2	2	-	-	-	-	-
Aonides paucibranchiata	P0723	131107	Southern, 1914	-	-	-	-	-	1	-
Atherospio guillei	P0724_A	478336	(Laubier & Ramos, 1974)	-	-	-	-	-	-	-
Laonice irinae	P0731_G	1518242	Sikorski, Radashevsky & Nygren in Sikorski et al, 2021	-	-	-	-	-	-	-
Dipolydora Species A	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-
Dipolydora Type N	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-
Polydora ciliata Type A	P0752	131141	(Johnston, 1838)	-	-	-	-	-	-	-
Dipolydora flava	P0754	131118	(Claparède, 1870)	3	-	5	-	2	-	2
Dipolydora saintjosephi	P0761	131123	(Eliason, 1920)	-	-	-	-	-	-	-
Pseudopolydora pulchra	P0774	131169	(Carazzi, 1893)	-	-	2	-	-	1	-
Pygospio elegans	P0776	131170	Claparède, 1863	-	-	-	1	-	-	-
Scolelepis korsuni	P0777_A	131174	Sikorski, 1994	-	-	-	-	-	-	-
Spio	P0787	129625	Fabricius, 1785	-	-	-	-	-	-	-
Spiophanes bombyx agg.	P0794	131187	(Claparède, 1870)	-	-	-	-	-	-	-
Magelona johnstoni	P0803_A	130269	Fiege, Licher & Mackie, 2000	-	-	-	-	-	-	-
Magelona alleni	P0804	130266	Wilson, 1958	-	-	-	-	-	-	-
Chaetopterus	P0811	129229	Cuvier, 1830	-	-	-	-	-	-	-
Aphelochaeta Type A	P0823	129240	Blake, 1991	1	-	-	-	1	-	1
Aphelochaeta marioni	P0824	129938	(Saint-Joseph, 1894)	-	3	8	-	-	-	-
Caulleriella alata	P0829	129943	(Southern, 1914)	-	-	-	-	-	-	-
Chaetozone zetlandica	P0831	336485	McIntosh, 1911	-	-	-	-	-	-	-
Dodecaceria	P0840	129246	Örsted, 1843	-	-	-	-	-	-	-
Flabelligera affinis	P0881	130103	M. Sars, 1829	-	-	-	-	-	-	-
Pherusa plumosa	P0885	130113	(Müller, 1776)	-	-	-	-	1	-	-
Mediomastus fragilis	P0919	129892	Rasmussen, 1973	2	-	11	-	1	-	-
Notomastus	P0920	129220	M. Sars, 1851	5	8	11	-	3	-	3
Leiochone	**P0951_F**	146991	Grube, 1868	-	-	-	-	-	-	-
Euclymene oerstedii	P0964	130294	(Claparède, 1863)	-	-	-	-	-	-	-
Praxillella affinis	P0971	130322	(M. Sars in G.O. Sars, 1872)	-	2	2	-	-	-	-
Micromaldane ornithochaeta	P0978	130310	Mesnil, 1897	-	-	-	-	-	-	-
Nicomache	P0979	129357	Malmgren, 1865	-	-	-	-	-	-	-
Petaloproctus	P0985	129359	Quatrefages, 1866	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Ophelia borealis	P0999	130491	Quatrefages, 1866	-	-	-	-	-	-	-
Travisia forbesii	P1007	130512	Johnston, 1840	-	-	-	-	-	-	-
Asclerocheilus intermedius	P1022	130974	(Saint-Joseph, 1894)	-	-	-	-	1	-	-
Scalibregma celticum	P1026	130979	Mackie, 1991	-	-	-	-	-	-	-
Scalibregma inflatum	P1027	130980	Rathke, 1843	-	-	-	-	-	-	-
Sclerocheilus minutus	P1029	130982	Grube, 1863	-	-	-	-	-	-	-
Polygordius	P1062	129472	Schneider, 1868	-	-	-	-	-	-	-
Galathowenia oculata	P1093	146950	(Zachs, 1923)	-	1	5	-	-	-	-
Owenia borealis	P1097_G	329882	Koh, Bhaud & Jirkov, 2003	-	-	1	-	1	-	1
Lagis koreni	P1107	152367	Malmgren, 1866	1	-	1	1	3	1	3
Sabellaria spinulosa	P1117	130867	(Leuckart, 1849)	-	-	12	-	72	3	3
Melinna palmata	P1124	129808	Grube, 1870	-	-	-	-	-	-	-
Ampharete lindstroemi	P1139	129781	Malmgren, 1867 sensu Hessle, 1917	4	6	7	-	3	-	3
Amphicteis midas	P1143	129785	(Gosse, 1855)	5	-	-	-	7	-	-
Terebellides	P1174	129717	Sars, 1835	-	-	-	-	-	-	-
Loimia ramzega	P1200_G	1036014	Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017	-	-	-	-	-	-	-
Nicolea venustula	P1210	131507	(Montagu, 1819)	-	-	-	-	-	-	-
Amaeana trilobata	P1229	131471	(Sars, 1863)	-	-	-	-	-	-	-
Lysilla loveni	P1233	131500	Malmgren, 1866	-	-	-	-	-	-	-
Lysilla nivea	P1234	131501	Langerhans, 1884	-	-	-	-	-	-	-
Polycirrus	P1235	129710	Grube, 1850	1	-	-	-	-	-	-
Thelepus parapari	P1253_G	1253692	Jirkov, 2018	-	-	-	-	-	-	-
Thelepus setosus	P1255	131544	(Quatrefages, 1866)	-	-	-	-	-	-	-
Jasmineira elegans	P1290	130921	Saint-Joseph, 1894	-	-	-	-	-	-	-
Perkinsiana rubra	P1307	130948	(Langerhans, 1880)	-	-	-	-	-	-	-
Pseudopotamilla	P1315	129548	Bush, 1905	-	-	-	-	-	-	-
Sabella discifera	P1318	130964	Grube, 1874	-	-	-	-	-	-	-
Sabella pavonina	P1320	130967	Savigny, 1822	-	-	-	-	-	-	-
Spirobranchus lamarcki	P1340	560033	(Quatrefages, 1866)	2	2	5	-	-	-	-
Spirobranchus triqueter	P1341	555935	(Linnaeus, 1758)	-	-	-	-	-	-	-
Tubificoides	P1487	137393	Lastočkin, 1937	-	-	-	-	-	-	-
Grania	P1524	137349	Southern, 1913	-	-	-	-	-	-	-
Nymphon brevirostre	Q0005	150520	Hodge, 1863	-	-	-	-	-	-	-
Achelia echinata	Q0015	134599	Hodge, 1864	-	-	-	-	1	-	-
Ammothella longipes	Q0018	134614	(Hodge, 1864)	-	-	-	-	-	-	-
Callipallene	**Q0032**	134581	Flynn, 1929	-	-	-	-	-	-	-
Anoplodactylus petiolatus	Q0044	134723	(Krøyer, 1844)	-	-	-	-	-	-	-
Verruca stroemia	R0041	106257	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Balanus crenatus	R0077	106215	Bruguière, 1789	-	-	-	-	-	-	-
OSTRACODA	R2412	1078	Latreille, 1802	-	-	-	-	-	-	-
Rissoides desmaresti	S0018	136135	(Risso, 1816)	-	-	-	-	-	-	-
Gastrosaccus spinifer	S0044	120020	(Goës, 1864)	-	-	-	-	-	-	-
Heteromysis (Heteromysis) microps	S0093	120037	(G.O. Sars, 1877)	-	-	-	-	-	-	-
Apherusa ovalipes	S0107	102172	Norman & Scott, 1906	-	-	-	-	-	-	-
Apolochus neapolitanus	S0159	236495	(Della Valle, 1893)	1	-	-	-	-	-	-
Leucothoe procera	S0179	102466	Spence Bate, 1857	-	-	-	-	-	-	-
Stenothoe marina	S0213	103166	(Spence Bate, 1857)	-	-	-	-	-	-	-
Urothoe brevicornis	S0247	103226	Spence Bate, 1862	-	-	-	-	-	-	-
Urothoe elegans	S0248	103228	Spence Bate, 1857	-	-	-	-	-	-	-
Urothoe marina	S0249	103233	(Spence Bate, 1857)	-	-	-	-	-	-	-
Harpinia pectinata	S0257	102972	Sars, 1891	-	-	-	-	-	-	-
Acidostoma neglectum	S0272_A	102495	Dahl, 1964	-	-	-	-	-	2	-
Lysianassa ceratina	S0303	102605	(Walker, 1889)	-	-	-	-	-	-	-
Iphimedia minuta	S0380	102345	G.O. Sars, 1883	-	-	-	-	-	-	-
Iphimedia nexa	S0381	102346	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-
Iphimedia spatula	S0384	102351	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-	-
Nototropis guttatus	S0411	488957	Costa, 1853	1	-	-	-	1	-	-
Ampelisca diadema	S0429	101896	(Costa, 1853)	5	-	-	-	2	1	-
Ampelisca spinipes	S0438	101928	Boeck, 1861	-	1	2	-	1	-	-

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Haploops	S0446	101447	Liljeborg, 1856	1	-	-	-	-	-	-
Bathyporeia elegans	S0452	103058	Watkin, 1938	-	-	-	-	-	-	-
Bathyporeia guilliamsoniana	S0454	103060	(Spence Bate, 1857)	-	-	-	-	-	-	-
Bathyporeia pelagica	S0456	103066	(Spence Bate, 1857)	-	-	-	-	-	-	-
Abludomelita obtusata	S0498	102788	(Montagu, 1813)	-	-	-	-	-	-	-
Cheirocratus (female)	S0503	101669	Norman, 1867	-	-	-	-	-	-	-
Othomaera othonis	S0519	534781	(H. Milne Edwards, 1830)	-	-	-	-	-	1	-
Maerella tenuimana	S0521	102831	(Spence Bate, 1862)	-	-	-	-	-	-	-
Megamphopus cornutus	S0539	102377	Norman, 1869	-	-	-	-	-	-	-
Gammaropsis maculata	S0541	102364	(Johnston, 1828)	-	-	-	-	-	-	-
Photis longicaudata	S0552	102383	(Spence Bate & Westwood, 1862)	1	1	-	-	-	-	-
Ericthonius	**S0561**	101567	H. Milne Edwards, 1830	-	-	-	-	1	-	-
Jassa	S0568	101571	Leach, 1814	-	-	-	-	-	-	-
Microjassa cumbrensis	S0574	102439	(Stebbing & Robertson, 1891)	-	-	-	-	-	-	-
Aoridae	**S0577**	101368	Stebbing, 1899	-	-	1	-	-	-	-
Crassicorophium crassicorne	S0611	397383	(Bruzelius, 1859)	-	-	-	-	-	-	-
Monocorophium sextonae	S0615	148603	(Crawford, 1937)	-	-	-	-	-	-	-
Unciola crenatipalma	S0621	102057	(Spence Bate, 1862)	-	-	-	-	2	-	-
Dyopedos monacanthus	S0628	489646	(Metzger, 1875)	-	-	-	-	-	-	1
Pariambus typicus	S0651	101857	(Krøyer, 1845)	-	-	-	-	-	-	-
Phtisica marina	S0657	101864	Slabber, 1769	-	-	-	-	-	-	-
Pseudoprotella phasma	S0659	101871	(Montagu, 1804)	-	-	-	-	-	-	-
Gnathia oxyuraea	S0796	118995	(Lilljeborg, 1855)	-	-	-	-	-	-	-
Anthura gracilis	S0803	118467	(Montagu, 1808)	-	-	-	-	-	-	-
Eurydice spinigera	S0855	148637	Hansen, 1890	-	-	-	-	-	-	-
Cleantis prismatica	S0947	119038	(Risso, 1826)	-	-	-	-	1	2	-
Astacilla longicornis	S0955	119024	(Sowerby, 1806)	-	-	-	-	-	-	-
Apseudes talpa	S1177	136285	(Montagu, 1808)	-	-	-	-	-	-	-
Bodotria scorpioides	S1197	110445	(Montagu, 1804)	-	1	-	-	1	-	-
Diastylis bradyi	S1248	110472	Norman, 1879	-	-	-	1	-	-	-
Diastylis rathkei	S1253	110487	(Krøyer, 1841)	-	-	1	-	-	-	-
Eualus cranchii	S1360	156083	(Leach, 1817 [in Leach, 1815-1875])	-	-	-	-	-	-	-
Axius stirhynchus	S1407	107722	Leach, 1816	-	-	-	-	-	-	-
Callianassa subterranea	S1415	107729	(Montagu, 1808)	-	-	-	-	-	-	-
Upogebia deltaura	S1419	107739	(Leach, 1816)	-	-	-	-	-	-	-
Anapagurus hyndmanni	S1448	107217	(Bell, 1845 [in Bell, 1844-1853])	-	-	-	-	-	-	-
Galathea intermedia	S1472	107150	Lilljeborg, 1851	-	-	-	-	-	-	-
Pisidia longicornis	S1482	107188	(Linnaeus, 1767)	-	-	-	-	-	1	-
Ebalia tuberosa	S1508	107301	(Pennant, 1777)	-	-	-	-	-	-	-
Ebalia tumefacta	S1509	107302	(Montagu, 1808)	-	-	-	-	-	-	-
Hyas coarctatus	S1519	107323	Leach, 1815 [in Leach, 1815-1875]	-	-	-	-	-	-	-
Macropodia rostrata	S1532	107345	(Linnaeus, 1761)	-	-	-	-	-	-	-
Atelecyclus rotundatus	S1555	107273	(Olivi, 1792)	-	-	-	-	-	-	-
Thia scutellata	S1559	107281	(Fabricius, 1793)	-	-	-	-	-	-	-
Pilumnus hirtellus	S1615	107418	(Linnaeus, 1761)	-	-	-	-	-	-	-
Leptochiton asellus	W0053	140199	(Gmelin, 1791)	-	1	-	-	-	-	-
Puncturella noachina	W0112	139975	(Linnaeus, 1771)	-	-	-	-	-	-	-
Steromphala tumida	W0161	1477356	(Montagu, 1803)	-	-	-	-	-	-	-
Steromphala cineraria	W0163	1039839	(Linnaeus, 1758)	-	-	-	-	1	-	1
Calliostoma zizyphinum	W0182	141767	(Linnaeus, 1758)	-	-	-	-	-	-	-
Crisilla semistriata	W0348	141280	(Montagu, 1808)	-	-	-	-	-	-	-
Caecum glabrum	W0418	138952	(Montagu, 1803)	-	-	-	-	-	-	-
Crepidula fornicata	W0439	138963	(Linnaeus, 1758)	-	-	-	-	-	-	-
Euspira nitida	W0491	151894	(Donovan, 1803)	-	-	-	-	-	-	-
Epitonium clathratulum	W0556	139718	(Kanmacher, 1798)	-	-	-	-	-	-	-
Ocenebra erinaceus	W0685	140405	(Linnaeus, 1758)	-	-	-	-	-	-	-
Buccinum undatum	W0708	138878	Linnaeus, 1758	-	-	-	-	-	-	-
Brachystomia eulimoides	W0922	491650	(Hanley, 1844)	-	-	-	-	-	-	-
Philine quadripartita	W1038_A	574582	Ascanius, 1772	-	-	-	1	-	-	-

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Duvaucelia	W1245_F	536858	Risso, 1826	-	-	-	-	-	-	-
Doto	W1270	137916	Oken, 1815	-	-	-	-	-	-	-
Acanthodoris pilosa	W1333	140627	(Abildgaard [in Müller], 1789)	1	-	-	-	-	-	-
Nucula hanleyi	W1568	140588	Winckworth, 1931	-	-	-	-	-	-	1
Nucula nitidosa	W1569	140589	Winckworth, 1930	-	-	-	12	-	-	-
Nucula nucleus	W1570	140590	(Linnaeus, 1758)	-	-	-	-	-	2	-
Striarca lactea	W1676	140571	(Linnaeus, 1758)	-	-	-	-	-	-	-
Glycymeris glycymeris	W1688	140025	(Linnaeus, 1758)	-	-	-	-	-	-	-
Mytilus edulis	W1695	140480	Linnaeus, 1758	-	-	-	-	-	-	-
Modiolus adriaticus	W1700	140462	Lamarck, 1819	-	-	-	-	-	-	-
Modiolus barbatus	W1701	140464	(Linnaeus, 1758)	-	-	-	-	-	-	-
Modiolula phaseolina	W1708	140461	(Philippi, 1844)	-	-	-	-	-	-	-
Musculus discors	W1721	140472	(Linnaeus, 1767)	-	-	-	-	-	-	-
Aequipecten opercularis	W1773	140687	(Linnaeus, 1758)	-	-	-	-	-	-	-
Heteranomia squamula	W1809	138749	(Linnaeus, 1758)	-	-	-	-	-	-	-
Diplodonta rotundata	W1864	141883	(Montagu, 1803)	-	-	-	-	-	-	-
Kellia suborbicularis	W1875	140161	(Montagu, 1803)	-	-	-	-	-	-	-
Tellimya ferruginosa	W1902	146952	(Montagu, 1808)	-	-	-	-	-	-	-
Kurtiella bidentata	W1906	345281	(Montagu, 1803)	4	-	1	-	-	-	1
Epilepton clarkiae	W1911	140366	(W. Clark, 1852)	1	-	-	-	-	-	-
Goodallia triangularis	W1929	138831	(Montagu, 1803)	-	-	-	-	-	-	-
Spisula elliptica	W1975	140300	(T. Brown, 1827)	-	-	-	-	-	-	-
Phaxas pellucidus	W2006	140737	(Pennant, 1777)	-	-	-	-	-	-	-
Moerella donacina	W2021	147021	(Linnaeus, 1758)	-	-	-	-	-	-	-
Asbjornsenia pygmaea	W2023	879714	(Lovén, 1846)	-	-	-	-	-	-	-
Abra alba	W2059	141433	(W. Wood, 1802)	1	-	-	-	6	-	4
Abra prismatica	W2062	141436	(Montagu, 1808)	-	-	-	-	-	-	-
Clausinella fasciata	W2100	141909	(da Costa, 1778)	-	-	-	-	-	-	-
Timoclea ovata	W2104	141929	(Pennant, 1777)	-	-	-	-	1	-	-
Polititapes rhomboides	W2113	745846	(Pennant, 1777)	-	-	-	-	-	-	-
Mya truncata	W2147	140431	Linnaeus, 1758	-	-	-	-	-	-	-
Sphenia binghami	W2152	140432	W. Turton, 1822	-	-	-	-	-	1	-
Varicorbula gibba	W2157	378492	(Olivi, 1792)	-	-	-	-	-	-	-
Rocellaria dubia	W2162	505249	(Pennant, 1777)	-	-	-	-	-	-	-
Hiatella	W2165	138068	Bosc, 1801	-	-	-	-	-	-	-
Saxicavella jeffreysi	W2172	140108	Winckworth, 1930	-	-	-	-	-	-	-
Barnea parva	W2183	140768	(Pennant, 1777)	-	-	-	-	-	-	-
Thracia villosiuscula	W2233	141651	(MacGillivray, 1827)	-	-	-	-	-	-	-
Thracia distorta	W2235	141647	(Montagu, 1803)	-	-	-	-	-	-	-
Phoronis	ZA0003	128545	Wright, 1856	1	5	1	-	1	-	1
Ophiothrix fragilis	ZB0124	125131	(Abildgaard in O.F. Müller, 1789)	-	-	-	-	-	-	-
Acrocnida brachiata	ZB0151	236130	(Montagu, 1804)	-	-	-	-	-	-	-
Amphiura filiformis	ZB0154	125080	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Amphipholis squamata	ZB0161	125064	(Delle Chiaje, 1828)	3	2	-	-	2	-	3
Ophiocten affinis	ZB0167	124850	(Lütken, 1858)	-	-	-	-	-	-	-
Ophiura albida	ZB0168	124913	Forbes, 1839	2	-	2	-	1	-	-
Ophiura ophiura	ZB0170	124929	(Linnaeus, 1758)	-	-	-	-	-	-	-
Psammechinus miliaris	ZB0193	124319	(P.L.S. Müller, 1771)	-	-	-	-	-	-	-
Echinocyamus pusillus	ZB0212	124273	(O.F. Müller, 1776)	-	-	-	-	-	-	-
Echinocardium cordatum	ZB0223	124392	(Pennant, 1777)	-	-	-	-	-	-	-
ENTEROPNEUSTA	ZC0012	1820	Gegenbaur, 1870	-	-	-	-	-	-	-
ASCIDIACEA	ZD0002	1839	Blainville, 1824	-	-	-	-	83	100	42
			Number of taxa:	288	288	288	288	288	288	288
			Abundance:	85	50	98	19	222	146	88

The following taxa (highlighted below) are merged in rationalised dataset above

Leiochone	P0951_F	146991	Grube, 1868	-	-	-	-	-	-	-
Leiochone tricirrata	P0951_F	328694	Bellan & Reys, 1967	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Leiochone johnstoni	P0958	221095	McIntosh, 1915	-	-	-	-	-	-	-
Leiochone	P0951_F	146991	Grube, 1868	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-
Callipallene tiberii	Q0038	134648	(Dohrn, 1881)	-	-	-	-	-	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	1	-	-
Ericthonius punctatus	S0564	102408	(Spence Bate, 1857)	-	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	1	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-	-
Leptocheirus hirsutimanus	S0588	102036	(Spence Bate, 1862)	-	-	1	-	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	1	-	-	-	-
PRESENCE/ABSENCE DATA										
Folliculinidae	A0003	1692	Dons, 1914	P	-	-	-	P	-	-
PORIFERA	C0001	558	Grant, 1836	-	-	-	-	-	-	-
Cliona agg.	C0475	132026	Grant, 1826	-	-	-	-	-	-	-
Raspailiidae	C1258	131642	Nardo, 1833	-	-	-	-	-	-	-
Haleciidae	D0389	1608	Hincks, 1868	-	-	-	-	-	-	-
Halecium	D0390	117103	Oken, 1815	-	-	-	-	-	-	-
Sertulariidae	D0407	1614	Lamouroux, 1812	-	-	-	-	-	-	-
Hydrallmania falcata	D0424	117890	(Linnaeus, 1758)	-	-	-	-	-	-	-
Sertularella	D0427	117233	Gray, 1848	-	-	-	-	-	-	-
Sertularia	D0433	117234	Linnaeus, 1758	-	-	-	-	-	-	-
Plumulariidae	D0447	1613	McCrady, 1859	-	-	-	-	-	-	-
Nemertesia	D0462	117195	Lamouroux, 1812	-	-	-	-	-	-	-
Plumularia setacea	D0469	117824	(Linnaeus, 1758)	-	-	-	-	-	-	-
Campanulariidae	D0491	1606	Johnston, 1836	-	-	-	-	-	-	-
Clytia	D0501	117030	Lamouroux, 1812	-	-	-	-	-	-	-
Clytia hemisphaerica	D0503	117368	(Linnaeus, 1767)	-	-	-	-	-	-	-
Alcyonium digitatum	D0597	125333	Linnaeus, 1758	P	-	-	-	-	-	-
Epizoanthus	D0648	100790	Gray, 1867	-	-	-	-	-	-	-
Crisia aculeata	Y0014	111690	Hassall, 1841	-	-	-	-	-	-	-
Oncousoecia dilatans	Y0025	111745	(Johnston, 1847)	-	-	-	-	-	-	-
Tubuliporidae	Y0026	110814	Johnston, 1837	-	-	-	-	-	-	-
Plagioecia patina	Y0041	111719	(Lamarck, 1816)	-	-	-	-	-	-	-
Disporella hispida	Y0066	111730	(Fleming, 1828)	-	-	-	-	-	-	-
Alcyonidiidae	Y0072	110783	Johnston, 1837	-	-	P	-	-	-	-
Alcyonidium	Y0073	110993	J.V.F.Lamouroux, 1813	-	-	-	-	-	-	-
Alcyonidium diaphanum	Y0076	111597	(Hudson, 1778)	-	-	-	-	-	P	-
Nolella dilatata	Y0092	111632	(Hincks, 1860)	-	-	-	-	-	-	-
Vesicularia spinosa	Y0131	111669	(Linnaeus, 1758)	-	-	-	-	-	P	-
Amathia lendigera	Y0135	111659	(Linnaeus, 1758)	-	-	-	-	-	-	-
Scruparia ambigua	Y0161	111539	(d'Orbigny, 1841)	-	-	-	-	-	-	-
Conopeum reticulum	Y0172	111351	(Linnaeus, 1767)	-	-	-	-	P	-	P
Electra monostachys	Y0177	111354	(Busk, 1854)	-	-	-	-	P	P	-
Electra pilosa	Y0178	111355	(Linnaeus, 1767)	P	-	P	-	-	P	-
Aspidelectra melolontha	Y0182	111350	(Landsborough, 1852)	P	-	P	-	P	-	P
Chartella papyracea	Y0192	111365	(Ellis & Solander, 1786)	-	-	-	-	-	-	-
Hincksina flustroides	Y0196	111369	(Hincks, 1877)	-	-	-	-	-	-	-
Amphiblestrum auritum	Y0222	111186	(Hincks, 1877)	-	-	-	-	-	-	-
Crisularia plumosa	Y0246	834039	(Pallas, 1766)	-	-	-	-	-	-	-
Bicellariella ciliata	Y0256	111147	(Linnaeus, 1758)	-	-	-	-	-	-	-
Puellina	Y0315	110897	Jullien, 1886	-	-	-	-	-	-	-
Hippothoa divaricata	Y0332	111399	Lamouroux, 1821	-	-	-	-	-	-	-
Chorizopora brongniartii	Y0344	111304	(Audouin, 1826)	-	-	-	-	-	-	-
Escharella immersa	Y0364	111484	(Fleming, 1828)	P	-	P	-	-	P	-
Escharella variolosa	Y0369	111495	(Johnston, 1838)	-	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
Escharella ventricosa	Y0370	111496	(Hassall, 1842)	-	-	-	-	-	-	-
Neolagenipora collaris	Y0376	111509	(Norman, 1867)	-	-	-	-	-	-	-
Porella concinna	Y0385	111125	(Busk, 1854)	-	-	-	-	-	-	-
Reptadeonella violacea	Y0401	111061	(Johnston, 1847)	-	-	-	-	-	-	-
Schizoporella hesperia	Y0427	111528	Hayward & Ryland, 1995	-	-	-	-	-	-	-
Escharina johnstoni	Y0440	111518	(Quelch, 1884)	-	-	-	-	-	-	-
Schizomavella	Y0467	110829	Canu & Bassler, 1917	P	P	P	-	-	P	-
Schizomavella (Schizomavella) linearis	Y0474	862795	(Hassall, 1841)	-	-	-	-	-	-	-
Microporella ciliata	Y0480	111421	(Pallas, 1766)	-	-	-	-	-	-	-
Fenestrulina	Y0482	110941	Jullien, 1888	-	-	-	-	-	-	-
Hagiosynodos latus	Y0520	111391	(Busk, 1856)	-	-	-	-	-	-	-
Didemnidae	ZD0041	103439	Giard, 1872	-	-	-	-	-	-	-
The following taxa have been removed from the main data matrix to facilitate analysis										
JUVENILES										
SIPUNCULA	N0001	1268	Stephen, 1964	-	-	1	-	-	-	-
Aphroditidae	P0017	938	Malmgren, 1867	-	-	-	-	1	-	-
Polynoidae	P0025	939	Kinberg, 1856	-	-	-	-	-	-	-
Nereididae	P0458	22496	Blainville, 1818	-	-	-	-	-	-	-
Nephtys	P0494	129370	Cuvier, 1817	-	-	-	-	-	-	-
Lumbrineridae	P0569	967	Schmarda, 1861	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-
Cirratulidae	P0822	919	Ryckholt, 1851	-	-	2	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-
Ampelisca	S0423	101445	Krøyer, 1842	-	-	-	-	-	-	-
AXIIDEA	S1403_A	477324	de Saint Laurent, 1979	-	-	-	-	-	-	-
Callianassidae	S1413	106800	Dana, 1852	-	-	-	-	-	-	-
Upogebia	S1418	107079	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-
Paguridae	S1445	106738	Latreille, 1802	-	-	-	-	-	-	-
Ebalia	S1504	106889	Leach, 1817 [in Leach, 1815-1875]	-	-	-	-	-	-	-
Macropodia	S1529	205077	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-	-
Cantharidinae	W0140_F	382171	Gray, 1857	-	-	-	-	-	-	-
Steromphala	W0162	576164	Gray, 1847	-	-	-	-	-	-	-
Buccinidae	W0702	149	Rafinesque, 1815	-	-	-	-	-	-	-
NUDIBRANCHIA	W1243	1762	Cuvier, 1817	-	-	-	-	-	-	-
Nucula	W1565	138262	Lamarck, 1799	-	-	-	3	-	-	-
Mytilidae	W1691	211	Rafinesque, 1815	-	-	-	-	-	-	-
Mytilus	W1693	138228	Linnaeus, 1758	1	-	1	-	5	35	2
Modiolus	W1698	138223	Lamarck, 1799	-	-	-	-	-	-	-
Musculus	W1719	138225	Röding, 1798	-	-	-	-	-	-	-
PECTINOIDEA	W1767	151320	Rafinesque, 1815	-	-	-	-	-	-	-
Anomiidae	W1805	214	Rafinesque, 1815	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	2	6	4	-	2
Mya	W2144	138211	Linnaeus, 1758	-	-	-	-	-	-	-
Pholadidae	W2174	252	Lamarck, 1809	-	-	-	-	-	-	-
Barnea	W2179	138341	Risso, 1826	-	-	-	-	-	-	-
THRACIOIDEA	W2225	382318	Stoliczka, 1870 (1839)	-	-	-	-	-	-	-
Thracia	W2227	138549	Blainville, 1824	-	-	-	-	-	-	-
Pandoridae	W2248	1787	Rafinesque, 1815	-	-	-	-	-	-	-
ASTEROIDEA	ZB0018	123080	de Blainville, 1830	-	-	-	-	-	-	-
OPHIUROIDEA	ZB0105	123084	Gray, 1840	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	2	1	-	-	1	-	-
ECHINOIDEA	ZB0181	123082	Leske, 1778	-	-	-	-	-	-	-
CAMARODONTA	ZB0190	510518	Jackson, 1912	-	-	-	-	-	-	-
SPATANGOIDA	ZB0213	123106	L. Agassiz, 1840	-	-	-	-	-	-	-
PELAGIC FAUNA										
CHAETOGNATHA	L0001	2081	-	**-**	**-**	**-**	**1**	**-**	**-**	**-**
PARASITIC FAUNA										

Taxon	SDC	AphiaID	Authority	FE7c_01FA 1232	FE7c_02FA 1233	FE7c_03FA 1234	FE7c_04FA 1235	FE7d_01FA 1236	FE7d_03 FA 1237	FE7e_01 FA 1238
BOPYROIDEA	S0956	155727	Rafinesque, 1815	-	-	-	-	-	-	-
DAMAGED FAUNA										
Polynoinae	P0025_F	155091	Kinberg, 1856	-	-	-	-	-	-	1
Harmothoe	P0050	129491	Kinberg, 1856	1	-	1	-	1	-	-
Paucibranchia	P0563_A	1297882	Molina-Acevedo, 2018	-	-	-	-	-	-	-
Aonides	P0721	129605	Claparède, 1864	-	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-	-
Dipolydora	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-	-
Maldanidae	P0938	923	Malmgren, 1867	-	-	-	-	-	-	-
Euclymeninae	P0951	152232	Arwidsson, 1906	-	-	-	-	-	5	-
Nicomachinae	P0976	154920	Arwidsson, 1906	-	-	-	-	-	-	-
Scalibregmatidae	P1020	925	Malmgren, 1867	-	-	-	-	-	-	-
Owenia	P1097	129427	Delle Chiaje, 1844	-	-	-	-	-	-	-
Ampharetidae	P1118	981	Malmgren, 1866	-	-	-	-	-	-	-
Ampharetinae	P1125	152252	Malmgren, 1866	-	1	-	-	-	-	-
Ampharete	P1133	129155	Malmgren, 1866	-	-	8	-	-	-	-
Terebellinae	P1179_A	322588	Johnston, 1846	-	-	-	-	-	-	-
POLYCIRRINI	P1227_SF	181512	Malmgren, 1866	-	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-	-
Serpulidae	P1324	988	Rafinesque, 1815	-	-	-	-	-	-	-
Spirobranchus	P1339	129582	Blainville, 1818	-	-	-	-	-	-	-
Urothoe	S0246	101789	Dana, 1852	-	-	-	-	-	-	-
Ampeliscidae	S0422	101364	Krøyer, 1842	-	-	-	-	-	-	-
Anthuridae	S0801	118244	Leach, 1814	-	-	-	-	-	-	-
GASTROPODA	W0088	101	Cuvier, 1795	-	-	-	-	-	-	-
Bodotria	S1193	110387	Goodsir, 1843	-	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-	-

SDC = Species Directory Code

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Cerianthus lloydii	D0632	283798	Gosse, 1859	-	-	-	-	-	-
ACTINIARIA	D0662	1360	Hertwig, 1882	-	-	-	20	-	-
Edwardsiidae	D0759	100665	Andres, 1881	-	-	-	-	-	-
PLATYHELMINTHES	F0001	793	Minot, 1876	-	-	-	1	-	-
NEMERTEA	G0001	152391	-	1	-	-	1	-	-
Loxosoma annelidicola	K0006	111811	(Van Beneden & Hesse, 1863)	-	-	-	-	-	-
Golfingia (Golfingia) elongata	N0014	175026	(Keferstein, 1862)	-	-	-	-	-	-
Golfingia (Golfingia) vulgaris vulgaris	N0017	410724	(de Blainville, 1827)	-	-	-	-	-	-
Maxmuelleria lankesteri	O0018	110368	(Herdman, 1897)	-	-	-	-	-	-
Pisione remota	P0015	130707	(Southern, 1914)	-	-	-	-	-	-
Subadyte pellucida	P0032	130833	(Ehlers, 1864)	-	-	-	-	-	-
Gattyana cirrhosa	P0049	130749	(Pallas, 1766)	-	-	-	-	-	-
Malmgrenia Type A	P0050_G@	147006	McIntosh, 1874	-	-	-	-	-	-
Malmgrenia bicki	P0050_G@	1044546	Barnich, Dietrich, Hager & Fiege, 2017	-	-	-	-	-	-
Malmgrenia arenicolae	P0050_G@	152276	(Saint-Joseph, 1888)	-	-	-	-	-	-
Malmgrenia darbouxi	P0050_G@	863197	(Pettibone, 1993)	-	-	-	-	-	-
Harmothoe clavigera	P0050_G	130760	(M. Sars, 1863)	-	-	-	2	-	-
Malmgrenia andreapolis	P0051	147008	McIntosh, 1874	-	-	-	-	-	-
Harmothoe antilopes	P0052	130754	McIntosh, 1876	-	-	-	-	-	-
Harmothoe extenuata	P0058	130762	(Grube, 1840)	-	-	-	-	-	-
Harmothoe impar	P0065	130770	(Johnston, 1839)	-	-	-	-	-	-
Lepidonotus squamatus	P0082	130801	(Linnaeus, 1758)	-	-	-	-	-	-
Polynoe scolopendrina	P0084	130830	Savigny, 1822	-	-	-	-	-	-
Pholoe inornata	P0092	130601	Johnston, 1839	-	-	-	9	-	-
Pholoe baltica	P0095	130599	Örsted, 1843	-	-	-	-	-	-
Sthenelais boa	P0107	131074	(Johnston, 1833)	-	-	-	1	-	-
Eteone longa agg.	P0118	130616	(Fabricius, 1780)	-	-	-	-	-	-
Hesionura elongata	P0122	130649	(Southern, 1914)	-	-	-	-	-	-
Mysta barbata	P0126	147027	Malmgren, 1865	-	-	-	-	-	-
Mysta picta	P0127	147026	(Quatrefages, 1866)	-	-	-	-	-	-
Phyllodoce groenlandica	P0141	334506	Örsted, 1842	-	-	-	-	-	-
Phyllodoce lineata	P0142	334508	(Claparède, 1870)	-	-	-	-	-	-
Phyllodoce longipes	P0143	130673	Kinberg, 1866	-	-	-	-	-	-
Eulalia expusilla	P0153	130625	Pleijel, 1987	-	-	-	-	-	-
Eulalia mustela	P0155	130631	Pleijel, 1987	-	-	-	-	-	-
Eulalia ornata	P0156	130632	Saint-Joseph, 1888	-	-	-	-	-	-
Eumida bahusiensis	P0164	130641	Bergstrom, 1914	-	-	-	-	-	-
Eumida sanguinea agg.	P0167	130644	(Örsted, 1843)	-	-	-	-	-	-
Glycera alba	P0256	130116	(O.F. Müller, 1776)	-	-	-	1	-	1
Glycera lapidum	P0260	130123	Quatrefages, 1866	-	-	-	1	-	-
Glycera oxycephala	P0262	130126	Ehlers, 1887	-	-	-	-	-	-
Glycinde nordmanni	P0268	130136	(Malmgren, 1866)	-	-	-	-	-	-
Goniada maculata	P0271	130140	Örsted, 1843	-	-	-	-	-	1
Sphaerodorum gracilis	P0291	131100	(Rathke, 1843)	-	-	-	-	-	-
Podarkeopsis capensis	P0319	130195	(Day, 1963)	-	-	-	-	-	-
Syllidia armata	P0321	130198	Quatrefages, 1866	-	-	-	-	-	-
Syllis garciai	P0351	131431	(Campoy, 1982)	-	-	-	-	-	-
Syllis pontxioi	P0358_A	196003	San Martín & López, 2000	-	-	-	-	-	-
Syllis armillaris	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-
Syllis cf. *armillaris*	P0365	131415	(O.F. Müller, 1776)	-	-	-	-	-	-
Syllis variegata	P0371	131458	Grube, 1860	-	-	-	-	-	-
Amblyosyllis spectabilis	P0374_A	1258721	(Johnston in Baird, 1861)	-	-	-	-	-	-
Eusyllis blomstrandi	P0380	131290	Malmgren, 1867	-	-	-	-	-	-
Odontosyllis fulgurans	P0387	131327	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-
Streptodonta pterochaeta	P0391	238207	(Southern, 1914)	-	-	-	-	-	-
Streptosyllis campoyi	P0402_G	238248	Brito, Núñez & San Martín, 2000	-	-	-	-	-	-
Syllides japonicus	P0409	131410	Imajima, 1966	-	-	-	-	-	-
Parexogone hebes	P0421	757970	(Webster & Benedict, 1884)	-	-	-	-	-	-
Exogone naidina	P0422	327985	Örsted, 1845	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Exogone verugera	P0423	333456	(Claparède, 1868)	-	-	-	-	-	-
Erinaceusyllis erinaceus	P0426	195953	(Claparède, 1863)	-	-	-	-	-	-
Sphaerosyllis taylori	P0430	131394	Perkins, 1981	-	-	-	-	-	-
Myrianida	P0449	129659	Milne Edwards, 1845	-	-	-	-	-	-
Proceraea aurantiaca	P0451_G	131361	Claparède, 1868	-	-	-	-	-	-
Rullierinereis ancornunezi	P0458_A	492034	Núñez & Brito, 2006	-	-	-	-	-	-
Eunereis longissima	P0475	130375	(Johnston, 1840)	-	-	-	-	-	-
Nephtys caeca	P0496	130355	(Fabricius, 1780)	-	-	-	-	-	-
Nephtys cirrosa	P0498	130357	Ehlers, 1868	-	-	-	-	-	-
Nephtys hombergii	P0499	130359	Savigny in Lamarck, 1818	2	-	-	-	-	1
Nephtys kersivalensis	P0502	130363	McIntosh, 1908	-	-	-	-	-	-
Nephtys longosetosa	P0503	130364	Örsted, 1842	-	-	-	-	-	-
Lysidice ninetta	P0562	130071	Audouin & H Milne Edwards, 1833	-	-	-	-	-	-
Paucibranchia totospinata	P0563_B	1305625	(Lu & Fauchald, 1998)	-	-	-	1	-	-
Paucibranchia bellii	P0564	1297885	(Audouin & Milne Edwards, 1833)	-	-	-	-	-	-
Marphysa sanguinea	P0566	130075	(Montagu, 1813)	-	-	-	-	-	-
Lysidice unicornis	P0568	742232	(Grube, 1840)	-	-	-	-	-	-
Hilbigneris pleijeli	P0569_F	396540	Carrera-Parra, 2006	-	-	-	-	-	-
Lumbrineris cf. *cingulata*	P0572_A	130240	Ehlers, 1897	-	-	-	2	-	-
Drilonereis	P0589	129200	Claparède, 1870	-	-	-	-	-	-
Protodorvillea kefersteini	P0638	130041	(McIntosh, 1869)	-	-	-	-	-	-
Schistomeringos neglecta	P0642	130044	(Fauvel, 1923)	-	-	-	-	-	-
Schistomeringos rudolphi	P0643	154127	(Delle Chiaje, 1828)	-	-	-	-	-	-
Orbinia sertulata	P0665	130523	(Savigny, 1822)	-	-	-	-	-	-
Scoloplos armiger	P0672	130537	(Müller, 1776)	-	-	-	-	-	1
Paradoneis lyra	P0699	130585	(Southern, 1914)	-	-	-	-	-	-
Poecilochaetus serpens	P0718	130711	Allen, 1904	-	-	-	-	-	-
Aonides oxycephala	P0722	131106	(Sars, 1862)	-	-	-	-	-	-
Aonides paucibranchiata	P0723	131107	Southern, 1914	-	-	-	-	-	2
Atherospio guillei	P0724_A	478336	(Laubier & Ramos, 1974)	-	-	-	-	-	-
Laonice irinae	P0731_G	1518242	Sikorski, Radashevsky & Nygren in Sikorski et al, 2021	-	-	-	-	-	-
Dipolydora Species A	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-
Dipolydora Type N	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-
Polydora ciliata Type A	P0752	131141	(Johnston, 1838)	-	-	-	-	-	-
Dipolydora flava	P0754	131118	(Claparède, 1870)	-	-	-	-	-	-
Dipolydora saintjosephi	P0761	131123	(Eliason, 1920)	-	-	-	-	-	-
Pseudopolydora pulchra	P0774	131169	(Carazzi, 1893)	-	-	-	2	-	-
Pygospio elegans	P0776	131170	Claparède, 1863	-	-	-	-	-	-
Scolelepis korsuni	P0777_A	131174	Sikorski, 1994	-	-	-	-	-	-
Spio	P0787	129625	Fabricius, 1785	-	-	-	-	-	-
Spiophanes bombyx agg.	P0794	131187	(Claparède, 1870)	-	-	-	1	-	4
Magelona johnstoni	P0803_A	130269	Fiege, Licher & Mackie, 2000	-	1	1	-	-	-
Magelona alleni	P0804	130266	Wilson, 1958	-	-	-	-	-	-
Chaetopterus	P0811	129229	Cuvier, 1830	-	-	-	-	-	-
Aphelochaeta Type A	P0823	129240	Blake, 1991	-	-	-	-	-	-
Aphelochaeta marioni	P0824	129938	(Saint-Joseph, 1894)	-	-	-	-	-	-
Caulleriella alata	P0829	129943	(Southern, 1914)	-	-	-	-	1	-
Chaetozone zetlandica	P0831	336485	McIntosh, 1911	-	-	-	2	-	-
Dodecaceria	P0840	129246	Örsted, 1843	-	-	-	-	-	-
Flabelligera affinis	P0881	130103	M. Sars, 1829	-	-	-	-	-	-
Pherusa plumosa	P0885	130113	(Müller, 1776)	-	-	-	-	-	-
Mediomastus fragilis	P0919	129892	Rasmussen, 1973	-	-	-	-	-	-
Notomastus	P0920	129220	M. Sars, 1851	1	-	-	2	-	-
Leiochone	**P0951_F**	146991	Grube, 1868	-	-	-	12	-	-
Euclymene oerstedii	P0964	130294	(Claparède, 1863)	-	-	-	-	-	-
Praxillella affinis	P0971	130322	(M. Sars in G.O. Sars, 1872)	-	-	-	4	-	-
Micromaldane ornithochaeta	P0978	130310	Mesnil, 1897	-	-	-	-	-	-
Nicomache	P0979	129357	Malmgren, 1865	-	-	-	-	-	-
Petaloproctus	P0985	129359	Quatrefages, 1866	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Ophelia borealis	P0999	130491	Quatrefages, 1866	-	-	-	-	-	-
Travisia forbesii	P1007	130512	Johnston, 1840	-	1	-	-	-	-
Asclerocheilus intermedius	P1022	130974	(Saint-Joseph, 1894)	-	-	-	-	-	-
Scalibregma celticum	P1026	130979	Mackie, 1991	-	-	-	-	-	-
Scalibregma inflatum	P1027	130980	Rathke, 1843	-	-	-	-	-	-
Sclerocheilus minutus	P1029	130982	Grube, 1863	-	-	-	-	-	-
Polygordius	P1062	129472	Schneider, 1868	-	-	-	-	-	-
Galathowenia oculata	P1093	146950	(Zachs, 1923)	-	-	-	4	-	1
Owenia borealis	P1097_G	329882	Koh, Bhaud & Jirkov, 2003	-	-	-	1	-	-
Lagis koreni	P1107	152367	Malmgren, 1866	-	-	-	15	-	4
Sabellaria spinulosa	P1117	130867	(Leuckart, 1849)	-	-	-	36	-	-
Melinna palmata	P1124	129808	Grube, 1870	-	-	-	-	-	-
Ampharete lindstroemi	P1139	129781	Malmgren, 1867 sensu Hessle, 1917	1	-	-	2	-	1
Amphicteis midas	P1143	129785	(Gosse, 1855)	-	-	-	-	-	-
Terebellides	P1174	129717	Sars, 1835	-	-	-	-	-	-
Loimia ramzega	P1200_G	1036014	Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017	-	-	-	-	-	-
Nicolea venustula	P1210	131507	(Montagu, 1819)	-	-	-	-	-	-
Amaeana trilobata	P1229	131471	(Sars, 1863)	-	-	-	-	-	-
Lysilla loveni	P1233	131500	Malmgren, 1866	-	-	-	-	-	-
Lysilla nivea	P1234	131501	Langerhans, 1884	-	-	-	1	-	-
Polycirrus	P1235	129710	Grube, 1850	-	-	-	1	-	-
Thelepus parapari	P1253_G	1253692	Jirkov, 2018	-	-	-	-	-	-
Thelepus setosus	P1255	131544	(Quatrefages, 1866)	-	-	-	-	-	-
Jasmineira elegans	P1290	130921	Saint-Joseph, 1894	-	-	-	-	-	-
Perkinsiana rubra	P1307	130948	(Langerhans, 1880)	-	-	-	-	-	-
Pseudopotamilla	P1315	129548	Bush, 1905	-	-	-	-	-	-
Sabella discifera	P1318	130964	Grube, 1874	-	-	-	-	-	-
Sabella pavonina	P1320	130967	Savigny, 1822	-	-	-	-	-	-
Spirobranchus lamarcki	P1340	560033	(Quatrefages, 1866)	-	-	-	-	-	-
Spirobranchus triqueter	P1341	555935	(Linnaeus, 1758)	-	-	-	-	-	-
Tubificoides	P1487	137393	Lastočkin, 1937	-	-	-	-	-	-
Grania	P1524	137349	Southern, 1913	-	-	-	-	-	-
Nymphon brevirostre	Q0005	150520	Hodge, 1863	-	-	-	-	-	-
Achelia echinata	Q0015	134599	Hodge, 1864	-	-	-	-	-	-
Ammothella longipes	Q0018	134614	(Hodge, 1864)	-	-	-	1	-	-
Callipallene	**Q0032**	134581	Flynn, 1929	-	-	-	1	-	-
Anoplodactylus petiolatus	Q0044	134723	(Krøyer, 1844)	-	-	-	-	-	-
Verruca stroemia	R0041	106257	(O.F. Müller, 1776)	-	-	-	-	-	-
Balanus crenatus	R0077	106215	Bruguière, 1789	-	-	-	-	-	-
OSTRACODA	R2412	1078	Latreille, 1802	-	-	-	-	-	-
Rissoides desmaresti	S0018	136135	(Risso, 1816)	-	-	-	-	-	-
Gastrosaccus spinifer	S0044	120020	(Goës, 1864)	-	-	-	-	-	-
Heteromysis (Heteromysis) microps	S0093	120037	(G.O. Sars, 1877)	-	-	-	-	-	-
Apherusa ovalipes	S0107	102172	Norman & Scott, 1906	-	-	-	-	-	-
Apolochus neapolitanus	S0159	236495	(Della Valle, 1893)	-	-	-	-	-	-
Leucothoe procera	S0179	102466	Spence Bate, 1857	-	-	-	-	-	-
Stenothoe marina	S0213	103166	(Spence Bate, 1857)	-	-	-	-	-	-
Urothoe brevicornis	S0247	103226	Spence Bate, 1862	-	-	-	-	-	-
Urothoe elegans	S0248	103228	Spence Bate, 1857	-	-	-	-	-	-
Urothoe marina	S0249	103233	(Spence Bate, 1857)	-	-	-	-	-	-
Harpinia pectinata	S0257	102972	Sars, 1891	-	-	-	-	-	-
Acidostoma neglectum	S0272_A	102495	Dahl, 1964	-	-	-	-	-	-
Lysianassa ceratina	S0303	102605	(Walker, 1889)	-	-	-	-	-	-
Iphimedia minuta	S0380	102345	G.O. Sars, 1883	-	-	-	-	-	-
Iphimedia nexa	S0381	102346	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-
Iphimedia spatula	S0384	102351	Myers & McGrath, in Myers, McGrath & Costello, 1987	-	-	-	-	-	-
Nototropis guttatus	S0411	488957	Costa, 1853	-	-	-	-	-	-
Ampelisca diadema	S0429	101896	(Costa, 1853)	-	-	-	-	-	-
Ampelisca spinipes	S0438	101928	Boeck, 1861	-	-	-	1	-	-

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Haploops	S0446	101447	Liljeborg, 1856	-	-	-	-	-	-
Bathyporeia elegans	S0452	103058	Watkin, 1938	-	-	-	-	-	-
Bathyporeia guilliamsoniana	S0454	103060	(Spence Bate, 1857)	-	-	-	-	-	-
Bathyporeia pelagica	S0456	103066	(Spence Bate, 1857)	-	-	1	-	-	-
Abludomelita obtusata	S0498	102788	(Montagu, 1813)	-	-	-	-	-	-
Cheirocratus (female)	S0503	101669	Norman, 1867	-	-	-	-	-	-
Othomaera othonis	S0519	534781	(H. Milne Edwards, 1830)	-	-	-	1	-	-
Maerella tenuimana	S0521	102831	(Spence Bate, 1862)	-	-	-	-	-	-
Megamphopus cornutus	S0539	102377	Norman, 1869	-	-	-	-	-	-
Gammaropsis maculata	S0541	102364	(Johnston, 1828)	-	-	-	-	-	-
Photis longicaudata	S0552	102383	(Spence Bate & Westwood, 1862)	-	-	-	-	-	-
Ericthonius	**S0561**	101567	H. Milne Edwards, 1830	-	-	-	-	-	-
Jassa	S0568	101571	Leach, 1814	-	-	-	-	-	-
Microjassa cumbrensis	S0574	102439	(Stebbing & Robertson, 1891)	-	-	-	-	-	-
Aoridae	**S0577**	101368	Stebbing, 1899	-	-	-	-	-	-
Crassicorophium crassicorne	S0611	397383	(Bruzelius, 1859)	-	-	-	-	-	-
Monocorophium sextonae	S0615	148603	(Crawford, 1937)	-	-	-	-	-	-
Unciola crenatipalma	S0621	102057	(Spence Bate, 1862)	-	-	-	-	-	-
Dyopedos monacanthus	S0628	489646	(Metzger, 1875)	-	-	-	-	-	-
Pariambus typicus	S0651	101857	(Krøyer, 1845)	-	-	-	-	-	-
Phtisica marina	S0657	101864	Slabber, 1769	-	-	-	-	-	-
Pseudoprotella phasma	S0659	101871	(Montagu, 1804)	-	-	-	-	-	-
Gnathia oxyuraea	S0796	118995	(Lilljeborg, 1855)	-	-	-	-	-	-
Anthura gracilis	S0803	118467	(Montagu, 1808)	-	-	-	-	-	-
Eurydice spinigera	S0855	148637	Hansen, 1890	-	-	-	-	-	-
Cleantis prismatica	S0947	119038	(Risso, 1826)	-	-	-	-	-	-
Astacilla longicornis	S0955	119024	(Sowerby, 1806)	-	-	-	-	-	-
Apseudes talpa	S1177	136285	(Montagu, 1808)	-	-	-	-	-	-
Bodotria scorpioides	S1197	110445	(Montagu, 1804)	-	-	-	2	-	-
Diastylis bradyi	S1248	110472	Norman, 1879	1	-	-	-	-	-
Diastylis rathkei	S1253	110487	(Krøyer, 1841)	-	-	-	-	-	-
Eualus cranchii	S1360	156083	(Leach, 1817 [in Leach, 1815-1875])	-	-	-	-	-	-
Axius stirhynchus	S1407	107722	Leach, 1816	-	-	-	-	-	-
Callianassa subterranea	S1415	107729	(Montagu, 1808)	-	-	-	-	-	-
Upogebia deltaura	S1419	107739	(Leach, 1816)	-	-	-	-	-	-
Anapagurus hyndmanni	S1448	107217	(Bell, 1845 [in Bell, 1844-1853])	-	-	-	-	-	-
Galathea intermedia	S1472	107150	Lilljeborg, 1851	-	-	-	-	-	-
Pisidia longicornis	S1482	107188	(Linnaeus, 1767)	-	-	-	-	-	-
Ebalia tuberosa	S1508	107301	(Pennant, 1777)	-	-	-	-	-	-
Ebalia tumefacta	S1509	107302	(Montagu, 1808)	-	-	-	-	-	-
Hyas coarctatus	S1519	107323	Leach, 1815 [in Leach, 1815-1875]	-	-	-	-	-	-
Macropodia rostrata	S1532	107345	(Linnaeus, 1761)	-	-	-	-	-	-
Atelecyclus rotundatus	S1555	107273	(Olivi, 1792)	-	-	-	-	-	-
Thia scutellata	S1559	107281	(Fabricius, 1793)	-	-	-	-	-	-
Pilumnus hirtellus	S1615	107418	(Linnaeus, 1761)	-	-	-	-	-	-
Leptochiton asellus	W0053	140199	(Gmelin, 1791)	-	-	-	-	-	-
Puncturella noachina	W0112	139975	(Linnaeus, 1771)	-	-	-	-	-	-
Steromphala tumida	W0161	1477356	(Montagu, 1803)	-	-	-	-	-	-
Steromphala cineraria	W0163	1039839	(Linnaeus, 1758)	-	-	-	-	-	-
Calliostoma zizyphinum	W0182	141767	(Linnaeus, 1758)	-	-	-	-	-	-
Crisilla semistriata	W0348	141280	(Montagu, 1808)	-	-	-	-	-	-
Caecum glabrum	W0418	138952	(Montagu, 1803)	-	-	-	-	-	-
Crepidula fornicata	W0439	138963	(Linnaeus, 1758)	-	-	-	-	-	-
Euspira nitida	W0491	151894	(Donovan, 1803)	-	-	-	-	-	-
Epitonium clathratulum	W0556	139718	(Kanmacher, 1798)	-	-	-	-	-	-
Ocenebra erinaceus	W0685	140405	(Linnaeus, 1758)	-	-	-	-	-	-
Buccinum undatum	W0708	138878	Linnaeus, 1758	-	-	-	-	-	-
Brachystomia eulimoides	W0922	491650	(Hanley, 1844)	-	-	-	-	-	-
Philine quadripartita	W1038_A	574582	Ascanius, 1772	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Duvaucelia	W1245_F	536858	Risso, 1826	-	-	-	-	-	-
Doto	W1270	137916	Oken, 1815	-	-	-	-	-	-
Acanthodoris pilosa	W1333	140627	(Abildgaard [in Müller], 1789)	-	-	-	-	-	-
Nucula hanleyi	W1568	140588	Winckworth, 1931	-	-	-	-	-	-
Nucula nitidosa	W1569	140589	Winckworth, 1930	41	-	-	-	1	1
Nucula nucleus	W1570	140590	(Linnaeus, 1758)	-	1	-	-	-	1
Striarca lactea	W1676	140571	(Linnaeus, 1758)	-	-	-	-	-	-
Glycymeris glycymeris	W1688	140025	(Linnaeus, 1758)	-	-	-	-	-	-
Mytilus edulis	W1695	140480	Linnaeus, 1758	-	-	-	39	-	-
Modiolus adriaticus	W1700	140462	Lamarck, 1819	-	-	-	-	-	-
Modiolus barbatus	W1701	140464	(Linnaeus, 1758)	-	-	-	-	-	-
Modiolula phaseolina	W1708	140461	(Philippi, 1844)	-	-	-	-	1	1
Musculus discors	W1721	140472	(Linnaeus, 1767)	-	-	-	-	-	-
Aequipecten opercularis	W1773	140687	(Linnaeus, 1758)	-	-	-	-	-	-
Heteranomia squamula	W1809	138749	(Linnaeus, 1758)	-	-	-	-	-	-
Diplodonta rotundata	W1864	141883	(Montagu, 1803)	-	-	-	-	-	-
Kellia suborbicularis	W1875	140161	(Montagu, 1803)	-	-	-	-	-	-
Tellimya ferruginosa	W1902	146952	(Montagu, 1808)	-	-	-	-	-	-
Kurtiella bidentata	W1906	345281	(Montagu, 1803)	-	-	-	-	-	-
Epilepton clarkiae	W1911	140366	(W. Clark, 1852)	-	-	-	-	-	-
Goodallia triangularis	W1929	138831	(Montagu, 1803)	-	-	-	1	-	-
Spisula elliptica	W1975	140300	(T. Brown, 1827)	-	-	-	-	-	-
Phaxas pellucidus	W2006	140737	(Pennant, 1777)	-	-	-	-	-	-
Moerella donacina	W2021	147021	(Linnaeus, 1758)	-	-	-	-	-	-
Asbjornsenia pygmaea	W2023	879714	(Lovén, 1846)	-	-	-	-	-	-
Abra alba	W2059	141433	(W. Wood, 1802)	-	-	-	4	-	4
Abra prismatica	W2062	141436	(Montagu, 1808)	-	-	-	-	-	-
Clausinella fasciata	W2100	141909	(da Costa, 1778)	-	-	-	-	-	-
Timoclea ovata	W2104	141929	(Pennant, 1777)	-	-	-	-	-	-
Polititapes rhomboides	W2113	745846	(Pennant, 1777)	-	-	-	-	-	-
Mya truncata	W2147	140431	Linnaeus, 1758	-	-	-	-	-	-
Sphenia binghami	W2152	140432	W. Turton, 1822	-	-	-	-	-	-
Varicorbula gibba	W2157	378492	(Olivi, 1792)	-	-	-	-	-	-
Rocellaria dubia	W2162	505249	(Pennant, 1777)	-	-	-	-	-	-
Hiatella	W2165	138068	Bosc, 1801	-	-	-	-	-	-
Saxicavella jeffreysi	W2172	140108	Winckworth, 1930	-	-	-	-	-	-
Barnea parva	W2183	140768	(Pennant, 1777)	-	-	-	-	-	-
Thracia villosiuscula	W2233	141651	(MacGillivray, 1827)	-	-	-	-	-	-
Thracia distorta	W2235	141647	(Montagu, 1803)	-	-	-	-	-	-
Phoronis	ZA0003	128545	Wright, 1856	-	-	-	-	-	-
Ophiothrix fragilis	ZB0124	125131	(Abildgaard in O.F. Müller, 1789)	-	-	-	-	-	-
Acrocnida brachiata	ZB0151	236130	(Montagu, 1804)	-	-	-	-	-	-
Amphiura filiformis	ZB0154	125080	(O.F. Müller, 1776)	-	-	-	-	-	-
Amphipholis squamata	ZB0161	125064	(Delle Chiaje, 1828)	-	-	-	-	1	-
Ophiocten affinis	ZB0167	124850	(Lütken, 1858)	-	-	-	-	-	-
Ophiura albida	ZB0168	124913	Forbes, 1839	-	-	-	-	-	-
Ophiura ophiura	ZB0170	124929	(Linnaeus, 1758)	-	-	-	-	-	-
Psammechinus miliaris	ZB0193	124319	(P.L.S. Müller, 1771)	-	-	-	-	-	-
Echinocyamus pusillus	ZB0212	124273	(O.F. Müller, 1776)	-	-	-	-	-	-
Echinocardium cordatum	ZB0223	124392	(Pennant, 1777)	-	-	-	-	-	-
ENTEROPNEUSTA	ZC0012	1820	Gegenbaur, 1870	-	-	-	-	-	-
ASCIDIACEA	ZD0002	1839	Blainville, 1824	-	-	-	244	-	-

Number of taxa:	288	288	288	288	288	288
Abundance:	47	3	2	416	4	23

The following taxa (highlighted below) are merged in rationalised dataset above

Leiochone	P0951_F	146991	Grube, 1868	-	-	-	11	-	-
Leiochone tricirrata	P0951_F	328694	Bellan & Reys, 1967	-	-	-	1	-	-

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Leiochone johnstoni	P0958	221095	McIntosh, 1915	-	-	-	-	-	-
Leiochone	P0951_F	146991	Grube, 1868	-	-	-	12	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	-	-	-
Callipallene tiberii	Q0038	134648	(Dohrn, 1881)	-	-	-	1	-	-
Callipallene	Q0032	134581	Flynn, 1929	-	-	-	1	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	-	-
Ericthonius punctatus	S0564	102408	(Spence Bate, 1857)	-	-	-	-	-	-
Ericthonius	S0561	101567	H. Milne Edwards, 1830	-	-	-	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-
Leptocheirus hirsutimanus	S0588	102036	(Spence Bate, 1862)	-	-	-	-	-	-
Aoridae	S0577	101368	Stebbing, 1899	-	-	-	-	-	-
PRESENCE/ABSENCE DATA									
Folliculinidae	A0003	1692	Dons, 1914	-	-	-	-	P	P
PORIFERA	C0001	558	Grant, 1836	-	-	-	-	-	-
Cliona agg.	C0475	132026	Grant, 1826	-	-	-	-	-	-
Raspailiidae	C1258	131642	Nardo, 1833	-	-	-	-	-	-
Haleciidae	D0389	1608	Hincks, 1868	-	-	-	-	-	-
Halecium	D0390	117103	Oken, 1815	-	-	-	-	-	-
Sertulariidae	D0407	1614	Lamouroux, 1812	-	-	-	-	-	-
Hydrallmania falcata	D0424	117890	(Linnaeus, 1758)	-	-	-	P	-	-
Sertularella	D0427	117233	Gray, 1848	-	-	-	-	-	-
Sertularia	D0433	117234	Linnaeus, 1758	-	-	-	-	-	-
Plumulariidae	D0447	1613	McCrady, 1859	-	-	-	-	-	-
Nemertesia	D0462	117195	Lamouroux, 1812	-	-	-	-	-	-
Plumularia setacea	D0469	117824	(Linnaeus, 1758)	-	-	-	-	-	-
Campanulariidae	D0491	1606	Johnston, 1836	-	-	-	-	-	-
Clytia	D0501	117030	Lamouroux, 1812	-	-	-	-	-	-
Clytia hemisphaerica	D0503	117368	(Linnaeus, 1767)	-	-	-	-	-	-
Alcyonium digitatum	D0597	125333	Linnaeus, 1758	-	-	-	-	-	-
Epizoanthus	D0648	100790	Gray, 1867	-	-	-	-	-	-
Crisia aculeata	Y0014	111690	Hassall, 1841	-	-	-	-	-	-
Oncousoecia dilatans	Y0025	111745	(Johnston, 1847)	-	-	-	-	-	-
Tubuliporidae	Y0026	110814	Johnston, 1837	-	-	-	-	-	-
Plagioecia patina	Y0041	111719	(Lamarck, 1816)	-	-	-	-	-	-
Disporella hispida	Y0066	111730	(Fleming, 1828)	-	-	-	-	-	-
Alcyonidiidae	Y0072	110783	Johnston, 1837	-	-	-	-	-	-
Alcyonidium	Y0073	110993	J.V.F.Lamouroux, 1813	-	-	-	-	-	-
Alcyonidium diaphanum	Y0076	111597	(Hudson, 1778)	-	-	-	-	-	-
Nolella dilatata	Y0092	111632	(Hincks, 1860)	-	-	-	-	-	-
Vesicularia spinosa	Y0131	111669	(Linnaeus, 1758)	-	-	-	-	-	-
Amathia lendigera	Y0135	111659	(Linnaeus, 1758)	-	-	-	-	-	-
Scruparia ambigua	Y0161	111539	(d'Orbigny, 1841)	-	-	-	-	-	-
Conopeum reticulum	Y0172	111351	(Linnaeus, 1767)	-	-	-	P	-	-
Electra monostachys	Y0177	111354	(Busk, 1854)	-	-	-	P	-	-
Electra pilosa	Y0178	111355	(Linnaeus, 1767)	-	-	-	P	-	-
Aspidelectra melolontha	Y0182	111350	(Landsborough, 1852)	P	-	-	P	-	-
Chartella papyracea	Y0192	111365	(Ellis & Solander, 1786)	-	-	-	-	-	-
Hincksina flustroides	Y0196	111369	(Hincks, 1877)	-	-	-	-	-	-
Amphiblestrum auritum	Y0222	111186	(Hincks, 1877)	-	-	-	-	-	-
Crisularia plumosa	Y0246	834039	(Pallas, 1766)	-	-	-	-	-	-
Bicellariella ciliata	Y0256	111147	(Linnaeus, 1758)	-	-	-	-	-	-
Puellina	Y0315	110897	Jullien, 1886	-	-	-	-	-	-
Hippothoa divaricata	Y0332	111399	Lamouroux, 1821	-	-	-	-	-	-
Chorizopora brongniartii	Y0344	111304	(Audouin, 1826)	-	-	-	-	-	-
Escharella immersa	Y0364	111484	(Fleming, 1828)	-	-	-	-	-	-
Escharella variolosa	Y0369	111495	(Johnston, 1838)	-	-	-	-	-	-

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
Escharella ventricosa	Y0370	111496	(Hassall, 1842)	-	-	-	-	-	-
Neolagenipora collaris	Y0376	111509	(Norman, 1867)	-	-	-	-	-	-
Porella concinna	Y0385	111125	(Busk, 1854)	-	-	-	-	-	-
Reptadeonella violacea	Y0401	111061	(Johnston, 1847)	-	-	-	-	-	-
Schizoporella hesperia	Y0427	111528	Hayward & Ryland, 1995	-	-	-	-	-	-
Escharina johnstoni	Y0440	111518	(Quelch, 1884)	-	-	-	-	-	-
Schizomavella	Y0467	110829	Canu & Bassler, 1917	-	-	-	-	-	-
Schizomavella (Schizomavella) linearis	Y0474	862795	(Hassall, 1841)	-	-	-	-	-	-
Microporella ciliata	Y0480	111421	(Pallas, 1766)	-	-	-	-	-	-
Fenestrulina	Y0482	110941	Jullien, 1888	-	-	-	-	-	-
Hagiosynodos latus	Y0520	111391	(Busk, 1856)	-	-	-	-	-	-
Didemnidae	ZD0041	103439	Giard, 1872	-	-	-	-	-	-
The following taxa have been removed from the main data matrix to facilitate analysis									
JUVENILES									
SIPUNCULA	N0001	1268	Stephen, 1964	-	-	-	-	-	-
Aphroditidae	P0017	938	Malmgren, 1867	-	-	-	-	-	-
Polynoidae	P0025	939	Kinberg, 1856	-	-	-	-	-	-
Nereididae	P0458	22496	Blainville, 1818	-	-	-	-	-	-
Nephtys	P0494	129370	Cuvier, 1817	-	-	-	-	-	-
Lumbrineridae	P0569	967	Schmarda, 1861	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-
Cirratulidae	P0822	919	Ryckholt, 1851	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-
Ampelisca	S0423	101445	Krøyer, 1842	-	-	-	-	-	-
AXIIDEA	S1403_A	477324	de Saint Laurent, 1979	-	-	-	-	-	-
Callianassidae	S1413	106800	Dana, 1852	-	-	-	-	-	-
Upogebia	S1418	107079	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-
Paguridae	S1445	106738	Latreille, 1802	-	-	-	-	-	-
Ebalia	S1504	106889	Leach, 1817 [in Leach, 1815-1875]	-	-	-	-	-	-
Macropodia	S1529	205077	Leach, 1814 [in Leach, 1813-1815]	-	-	-	-	-	-
Cantharidinae	W0140_F	382171	Gray, 1857	-	-	-	-	-	-
Steromphala	W0162	576164	Gray, 1847	-	-	-	-	-	-
Buccinidae	W0702	149	Rafinesque, 1815	-	-	-	-	-	-
NUDIBRANCHIA	W1243	1762	Cuvier, 1817	-	-	-	-	-	-
Nucula	W1565	138262	Lamarck, 1799	4	2	-	-	-	3
Mytilidae	W1691	211	Rafinesque, 1815	-	-	-	-	-	-
Mytilus	W1693	138228	Linnaeus, 1758	-	-	-	649	-	-
Modiolus	W1698	138223	Lamarck, 1799	-	-	-	-	-	-
Musculus	W1719	138225	Röding, 1798	-	-	-	-	-	-
PECTINOIDEA	W1767	151320	Rafinesque, 1815	-	-	-	-	-	-
Anomiidae	W1805	214	Rafinesque, 1815	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	2	1	-	16	-	6
Mya	W2144	138211	Linnaeus, 1758	-	-	-	-	-	-
Pholadidae	W2174	252	Lamarck, 1809	-	-	-	-	-	-
Barnea	W2179	138341	Risso, 1826	-	-	-	-	-	-
THRACIOIDEA	W2225	382318	Stoliczka, 1870 (1839)	-	-	-	-	-	-
Thracia	W2227	138549	Blainville, 1824	-	-	-	-	-	-
Pandoridae	W2248	1787	Rafinesque, 1815	-	-	-	-	-	-
ASTEROIDEA	ZB0018	123080	de Blainville, 1830	-	-	-	-	-	-
OPHIUROIDEA	ZB0105	123084	Gray, 1840	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-
ECHINOIDEA	ZB0181	123082	Leske, 1778	-	-	-	-	-	-
CAMARODONTA	ZB0190	510518	Jackson, 1912	-	-	-	-	-	-
SPATANGOIDA	ZB0213	123106	L. Agassiz, 1840	-	-	-	-	-	-
PELAGIC FAUNA									
CHAETOGNATHA	L0001	2081	-	**-**	**-**	**-**	**-**	**-**	**1**
PARASITIC FAUNA									

Taxon	SDC	AphiaID	Authority	FE7e_02 FA 1239	FE7e_03 FA 1240	FE7f_01 FA 1241	FE7g_01FA 1242	FE7g_02FA 1243	FE7g_03FA 1244
BOPYROIDEA	S0956	155727	Rafinesque, 1815	-	-	-	-	-	-
DAMAGED FAUNA									
Polynoinae	P0025_F	155091	Kinberg, 1856	-	-	-	4	-	-
Harmothoe	P0050	129491	Kinberg, 1856	-	-	-	-	-	-
Paucibranchia	P0563_A	1297882	Molina-Acevedo, 2018	-	-	-	1	-	-
Aonides	P0721	129605	Claparède, 1864	-	-	-	-	-	-
Laonice	P0731	129613	Malmgren, 1867	-	-	-	-	-	-
Dipolydora	P0748_A	129611	Verrill, 1881	-	-	-	-	-	-
Maldanidae	P0938	923	Malmgren, 1867	-	-	-	-	-	-
Euclymeninae	P0951	152232	Arwidsson, 1906	-	-	-	-	-	-
Nicomachinae	P0976	154920	Arwidsson, 1906	-	-	-	-	-	-
Scalibregmatidae	P1020	925	Malmgren, 1867	-	-	-	-	-	-
Owenia	P1097	129427	Delle Chiaje, 1844	-	-	-	-	-	1
Ampharetidae	P1118	981	Malmgren, 1866	-	-	-	-	-	-
Ampharetinae	P1125	152252	Malmgren, 1866	-	-	-	-	-	-
Ampharete	P1133	129155	Malmgren, 1866	-	-	-	-	-	-
Terebellinae	P1179_A	322588	Johnston, 1846	-	-	-	-	-	-
POLYCIRRINI	P1227_SF	181512	Malmgren, 1866	-	-	-	-	-	-
Sabellidae	P1257	985	Latreille, 1825	-	-	-	-	-	-
Serpulidae	P1324	988	Rafinesque, 1815	-	-	-	-	-	-
Spirobranchus	P1339	129582	Blainville, 1818	-	-	-	-	-	-
Urothoe	S0246	101789	Dana, 1852	-	-	-	1	-	-
Ampeliscidae	S0422	101364	Krøyer, 1842	-	-	-	-	-	-
Anthuridae	S0801	118244	Leach, 1814	-	-	-	-	-	-
GASTROPODA	W0088	101	Cuvier, 1795	-	-	-	-	-	-
Bodotria	S1193	110387	Goodsir, 1843	-	-	-	-	-	-
Spisula	W1973	138159	Gray, 1837	-	-	-	-	-	-
Abra	W2058	138474	Lamarck, 1818	-	-	-	-	-	-
Ophiuridae	ZB0165	123200	Müller & Troschel, 1840	-	-	-	-	-	-

SDC = Species Directory Code

F.3 Intertidal Cores Macrofaunal Biomass

Station	Biomass [g/0.01m^2]				
	Annelida		Arthropoda	Mollusca	Other phyla
	Polychaeta	Oligochaeta			
I_TR01_HW	-	0.0005	-	-	0.0001
I_TR01_LW	0.0050	-	0.0019	-	-
I_TR01_MW	0.0003	-	-	-	0.0001
I_TR02_HW	-	0.0018	-	-	0.0001
I_TR02_LW	0.0002	-	-	-	0.0001
I_TR02_MW	0.0013	-	-	0.0014	0.0001
I_TR03_HW	-	0.0001	-	-	0.0001
I_TR03_LW	0.0008	-	0.0001	-	0.0005
I_TR03_MW	-	-	-	-	-
I_TR04_HW	-	-	0.0037	-	-
I_TR04_LW	0.0026	-	0.0053	-	0.0001
I_TR04_MW	0.0003	-	0.0001	-	0.0001
I_TR05_HW	-	-	-	-	0.0001
I_TR05_LW	0.0106	-	0.0016	-	0.0001
I_TR05_MW	-	-	-	-	0.0001
I_TR06_LW	0.0015	-	0.0036	-	0.0001
I_TR06_MW	0.0003	-	0.0041	-	0.0018
I_TR07_HW	-	-	-	-	0.0001
I_TR07_LW	0.0014	-	0.0027	-	-
I_TR07_MW	0.0001	-	-	-	0.0002
I_TR08_HW	-	-	-	-	0.0001
I_TR08_LW	0.0001	-	0.0007	-	0.0001
I_TR08_MW	0.0004	-	0.0087	-	0.0001

F.4 Subtidal Grabs Macrofaunal Biomass

Station	Biomass [g/0.01m²]					
	Annelida		Arthropoda	Mollusca	Echinodermata	Other phyla
	Polychaeta	Oligochaeta				
FE4_02FA	1.7977	-	0.6422	1.6484	4.8532	0.0769
FE4_03FA	8.1253	-	0.5483	0.1353	0.0086	0.0461
FE4_04FA	0.7408	-	8.1672	2.2324	3.309	0.024
FE4_05FA	1.9917	-	6.5995	0.3168	4.3967	0.0069
FE4_06FA	0.0581	-	0.012	0.0001	-	0.0009
FE4_07FA	0.0759	-	1.0347	0.0025	0.0986	0.0036
FE4_08FA	3.7361	-	0.8536	11.8195	0.3623	0.0593
FE5_01FA	4.3261	-	0.4848	0.033	0.7022	0.0192
FE5_02FA	0.5542	-	0.3116	0.0093	0.1756	0.0246
FE5_03FA	2.6249	-	1.8159	0.07	4.9751	0.127
FE5_04FA	0.3315	-	0.1273	0.0015	1.8137	0.0273
FE5_05FA	0.3038	-	0.0014	0.0457	2.0426	0.0207
FE5_06FA	0.1376	-	2.0262	0.0495	16.6544	1.7744
FE5_07FA	0.3328	-	-	0.0256	0.2069	0.0181
FE5_08FA	2.0878	-	0.4765	0.2342	7.2733	0.0067
FE5_09FA	0.1363	-	3.3809	0.788	27.1686	0.2328
FE5_10FA	0.9632	-	4.5254	0.8641	0.6075	0.0289
FE6_01FA	0.3897	-	0.128	0.379	6.7459	0.2799
FE6_02FA	0.1619	-	0.0308	0.9216	0.0018	0.0042
FE6_04FA	0.4552	-	0.0344	0.1386	14.8624	0.0085
FE6_06FA	0.0692	-	-	0.0342	-	0.0049
FE6_07FA	0.011	-	-	-	-	-
FE6_08FA	0.0019	-	-	-	-	0.0002
FE6_09FA	0.0276	-	-	-	-	-
FE6_10FA	0.1605	-	0.0049	-	0.3219	-
FE6_11FA	34.9144	-	0.0025	0.7808	1.1493	0.0006
FE7b_02FA	2.5348	0.0025	0.1288	55.0817	0.0279	0.0231
FE7b_04FA	22.3379	-	0.1182	11.076	0.0019	0.0073
FE7b_05FA	2.8761	-	2.0429	4.5278	0.0042	0.2619
FE7b_06FA	0.6474	-	0.3873	0.521	14.5799	0.3072
FE7c_01FA	0.3827	-	0.0229	0.0219	0.3539	0.3978
FE7c_02FA	0.3989	-	0.0073	0.007	0.003	0.4519
FE7c_03FA	0.5304	-	0.071	0.0065	0.5967	0.212
FE7c_04FA	0.4844	-	0.0094	0.2681	-	0.0061
FE7d_01FA	0.7129	-	0.0455	0.0628	0.265	0.2106

Station	Biomass [g/0.01m^2]					
	Annelida		Arthropoda	Mollusca	Echinodermata	Other phyla
	Polychaeta	Oligochaeta				
FE7d_03 FA	0.0637	-	0.059	0.0894	-	0.0007
FE7e_01 FA	0.5079	-	0.0005	0.0469	0.0076	0.0552
FE7e_02 FA	0.034	-	0.0041	0.8689	-	0.0133
FE7e_03 FA	0.0807	-	-	0.053	-	-
FE7f_01 FA	0.0029	-	0.0013	-	-	-
FE7g_01FA	1.1488	-	0.026	2.9515	0.0023	0.0141
FE7g_02FA	0.0026	-	-	0.0348	0.0011	-
FE7g_03FA	0.4706	-	-	0.2603	-	0.0001

Notes
Arthropoda comprises only invertebrates of the subphylum Crustacea
Other phyla included: Chordata, Cnidaria, Entoprocta, Hemichordata, Nemertea, Phoronida, Platyhelminthes and Sipuncula

PHONE 0333 880 5306
EMAIL fiveestuaries@rwe.com
WEBSITE www.fiveestuaries.co.uk
ADDRESS Five Estuaries Offshore Wind Farm Ltd
Windmill Hill Business Park
Whitehill Way, Swindon, SN5 6PB
COMPANY NO Registered in England and Wales
company number 12292474