

Survey Report: C5650

Swallow Sand rMCZ 2012 Survey Report

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1 Background and Introduction

1.1 Survey Project Team

The Swallow Sand rMCZ survey was carried out during 16th – 22nd May 2012 on the RV *CEFAS Endeavour* cruise CEND 08/12. The survey team for the duration of the fieldwork included marine ecologists, marine surveyors and Marine Protected Area (MPA) specialists (see below).

Cefas-Marine Ecologist
Cefas-Marine Surveyor
Cefas-Survey Manager
Cefas-Marine Ecologist
Cefas-Sedimentologist
Cefas-Habitat Mapper
Cefas-Marine Surveyor

Cefas-Marine Ecologist
Cefas-Marine Ecologist
Net Survey-Marine Surveyor
EGS-Marine Surveyor
JNCC-MPA Specialist
MSc. Student
MSc. Student

1.2 Site Description

Swallow Sand rMCZ is located approximately 100 km offshore of the NE coast of England (Figure 1).

(For a detailed site description see *NetGain Final Report and Recommendations for Marine Conservation Zones 2011*)

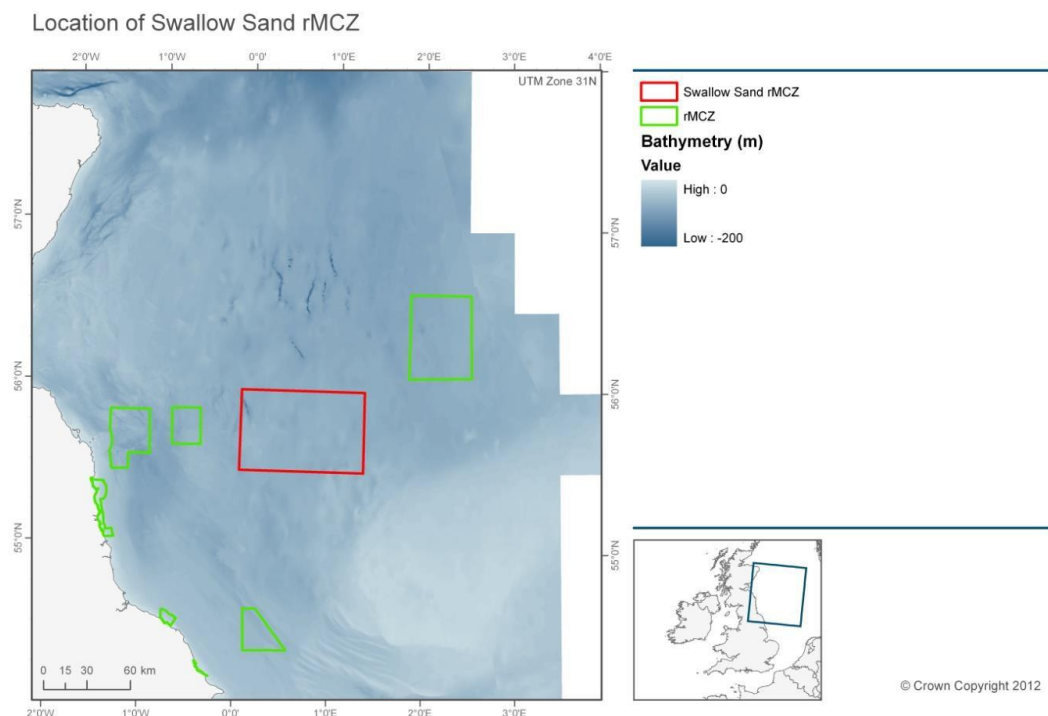


Figure 1. Location of Swallow Sand rMCZ. [Bathymetry is from the Defra Digital Elevation Model (Astrium 2011)]

1.3 Geological and Biological Context

A number of Broad Scale Habitat (BSH) features and FOCI have been proposed by the regional project for designation within the Swallow Sand rMCZ (Table 1).

Table 1. Features proposed for designation within Swallow Sand rMCZ.

Feature Type	Feature Name
Broad Scale Habitat (BSH)	A5.1: Subtidal coarse sediment A5.2: Subtidal sand
Features of Conservation Interest (FOCI)	
Habitats	Subtidal sands and gravels*
Species	N/A
Geomorphological Feature	North Sea glacial tunnel valleys (Swallow Hole)

****Subtidal sands and gravels are considered to be adequately protected by its component habitat features subtidal sand and/or subtidal coarse sediment, and is no longer included within MCZ designations***

A number of additional species FOCI had previously been identified as present within the Swallow Sand rMCZ. However, these were not proposed for designation due to the limited evidence of their occurrence within the area of interest or their high mobility (Table 2).

Table 2. Features not proposed for designation within Swallow Sand rMCZ.

Feature Type	Feature Name
Broad Scale Habitat (BSH)	N/A
Features of Conservation Interest (FOCI)	
Habitats	N/A
Species	<i>Arctica islandica</i>

1.4 Existing data and information utilised to inform survey planning

The broadscale habitat map presented in the SAD for this site was used to assist with the planning of the Swallow Sand rMCZ survey.

2 Survey Design and Methods

2.1 Survey planning and design

2.1.1 Acoustic survey

Multibeam bathymetry and backscatter data were collected opportunistically on transit between the ground truthing survey stations. Additional targeted acoustic survey was applied where the acoustic data collected during transits indicated the presence of a habitat boundary or where potential features of interest were observed.

2.1.2 Groundtruthing

Selection and positioning of ground-truthing stations was informed using the predicted BSH extents derived from the Site Assessment Document (SAD) habitat map. Grab sampling stations were positioned within the predicted extents of the sedimentary habitats using a triangular lattice grid overlaid on the predictive habitat map. Stations within the predicted subtidal sand sediments were at a grid spacing of 9 km and coarse sediments were at a grid spacing of 3 km.

Within the predicted sedimentary habitats, the selection of stations where the camera sledge would be used in addition to the grab was informed by the sediment type present in the grab sample (i.e., where the grab sample confirmed the presence of a given BSH the camera was deployed to allow characterisation of the surface sediment types and epifaunal communities). The number of camera deployments per BSH varied depending on the uniformity of the habitat and its spatial extent.

2.2 Sample collection and processing methods

2.2.1 Sedimentary Broad Scale Habitats

Sedimentary habitats were groundtruthed by grab and underwater camera. The grab system comprised a 0.1 m² mini Hamon grab fitted with a video camera (Figure 2), the combined gear being known as a HamCam. This allowed an image of the undisturbed seabed surface to be obtained for each grab sample. On recovery, the grab was emptied into a large plastic bin and a representative sub-sample of sediment (approx. 0.5 litres) taken for Particle Size Analysis (PSA). The sample was stored in a labelled plastic container and frozen ready for transfer to a laboratory ashore.

The remaining sample was photographed and the volume of sediment measured and recorded. Benthic fauna were collected by washing the sample with sea-water over a 1mm sieve. The retained >1 mm fraction was transferred to a labelled container and preserved in 4% buffered formaldehyde for later analysis ashore.



Figure 2. Mini Hamon grab with video camera (HamCam).

The camera sledge system comprised a video camera with capability to also capture still images (Figure 3). Illumination was provided by two Cefas high intensity LED striplights and a flash unit. The camera was fitted with a four-spot laser-scaling device to provide a reference scale in the video image. Set-up and operation followed the MESH 'Recommended Operating Guidelines (ROG) for underwater video and photographic imaging techniques'. Video was recorded simultaneously to a Sony GV-HD700 DV tape recorder and a computer hard drive. A video overlay was used to provide station metadata, time and GPS position (of the vessel) in the recorded video image.

Camera tows lasted a minimum of 10 minutes, with the sledge being towed at ~ 0.5 knots ($\sim 0.25 \text{ ms}^{-1}$) across a 50 m 'bullring' centred on the sampling station. Still images were captured at regular one-minute intervals and opportunistically if specific features of interest were encountered. The sledge was controlled by a winch operator with sight of the video monitor, and at most stations a note was made of the amount of tow cable deployed to allow a 'lay back' to be applied to estimate the distance of the sledge behind the vessel.

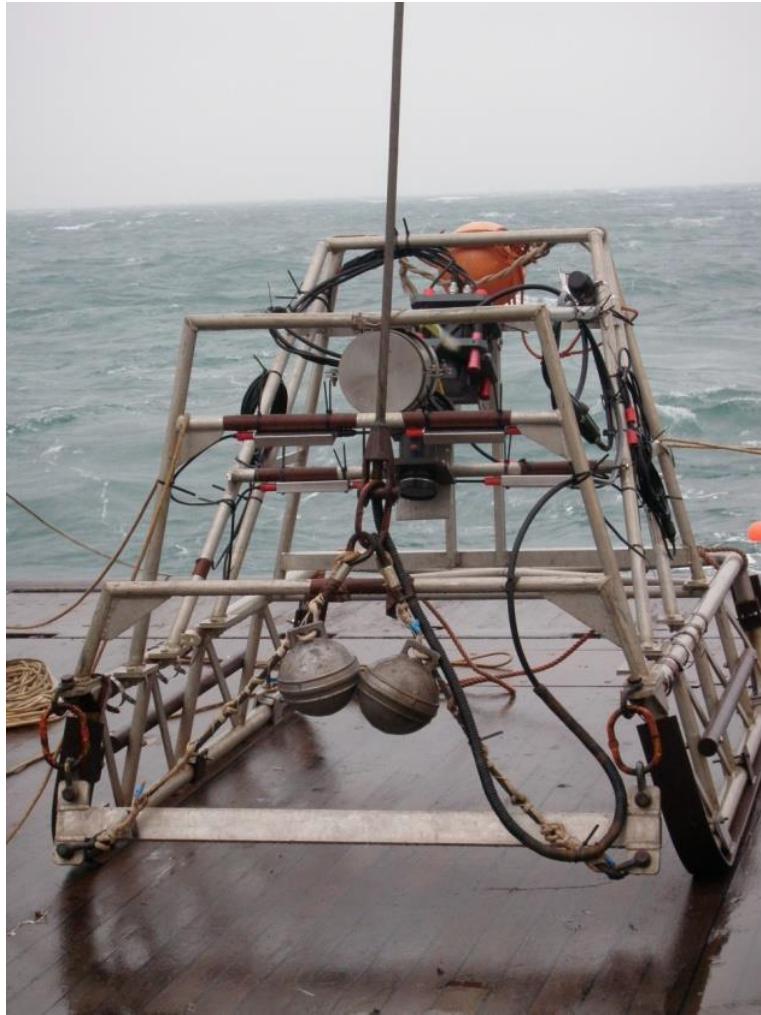


Figure 3. Camera sledge with video and still imaging system.

3 Survey Narrative

Survey at the Swallow Sand rMCZ began at 21:15 on 16/05/12, occupying stations on the pre-planned survey grid. A total of 104 stations were sampled, 103 by Hamon and 38 by camera sledge. On completion of the sampling grid an additional multibeam survey was undertaken in the western region of the rMCZ to target areas of coarse sediments identified to be present by the ground-truthing survey and the opportunistic multibeam survey.

4 Preliminary Results

4.1 Acoustic Maps

4.1.1 Multibeam data collected opportunistically during transits

Multibeam bathymetry and backscatter data were initially collected opportunistically during transits between the ground truthing stations (Figure 4). This allowed certain large-scale bathymetric features and distinct boundaries between different sediment types to be identified where present within the areas covered during transit.



Figure 4. Backscatter from multibeam survey at Swallow Sand rMCZ.

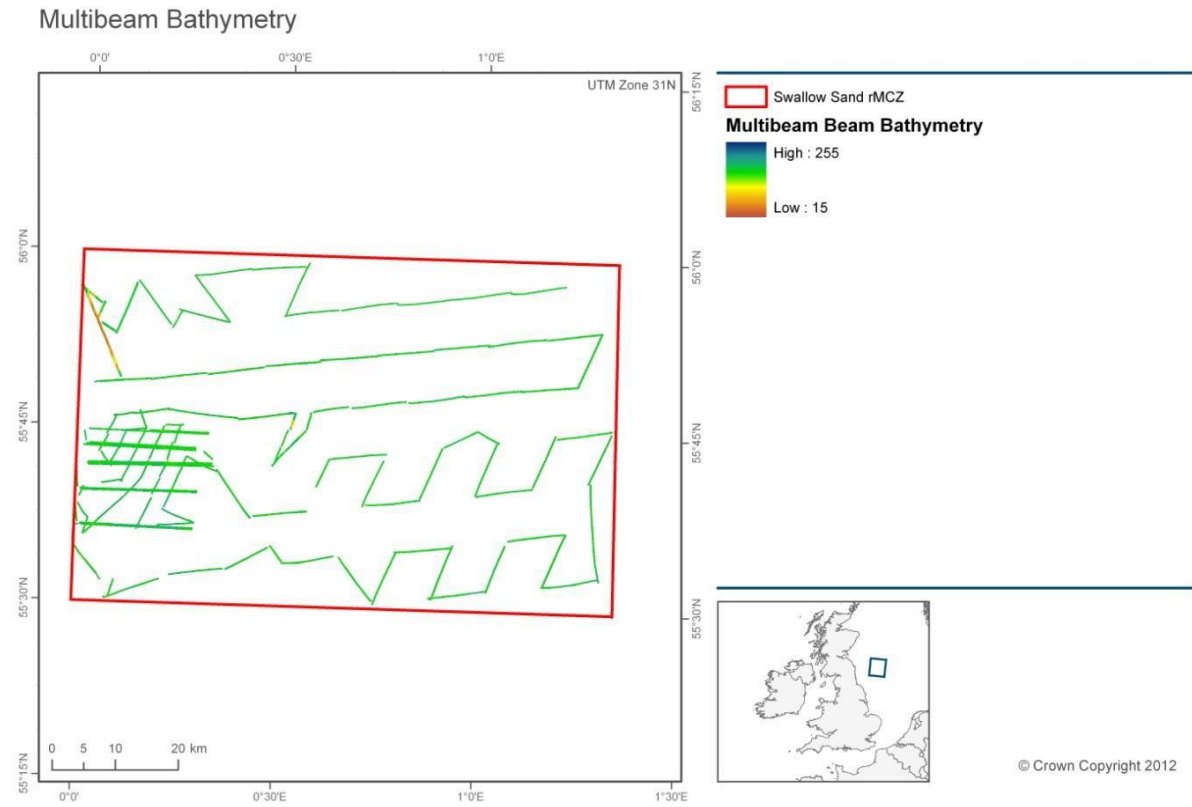







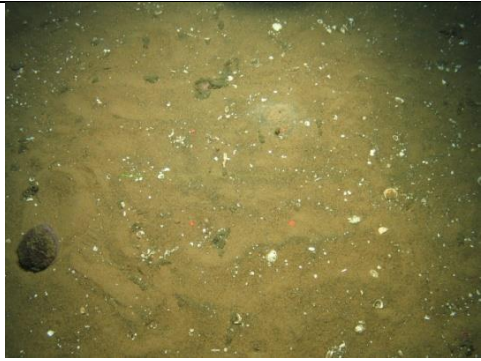
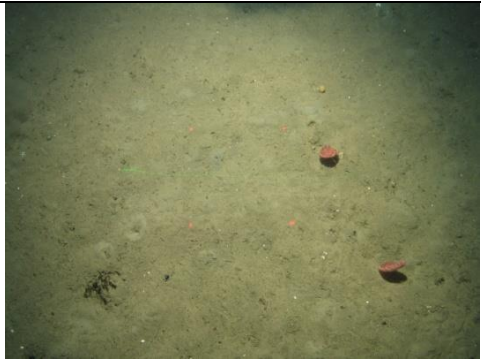

Figure 5. Bathymetry from multibeam survey at Swallow Sand rMCZ.


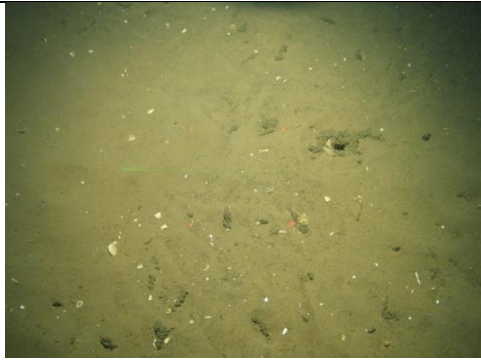

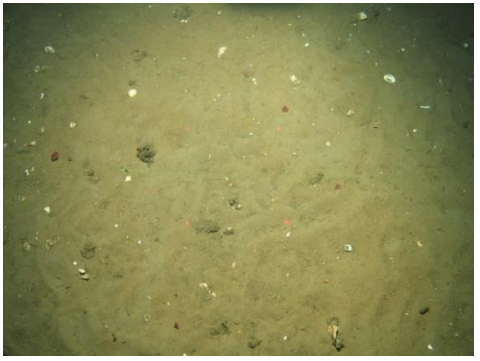
4.2 Seabed Imagery

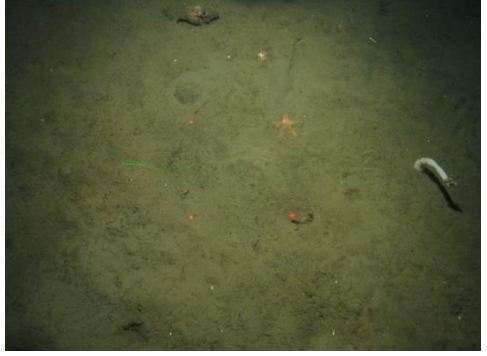
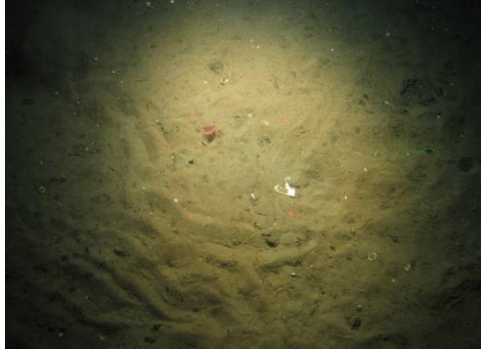
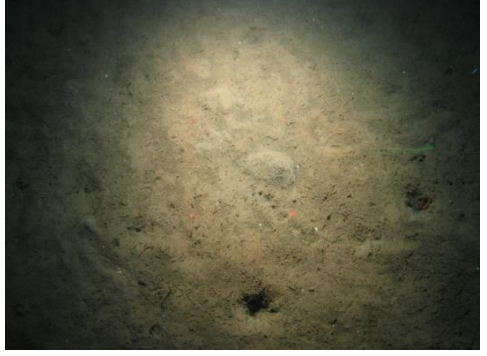

A preliminary summary of the seabed substrate and epifaunal communities observed in video and still images is given below for each of the predicted BSH's on the SAD habitat map.



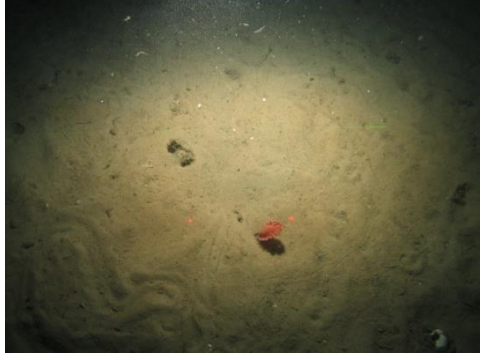
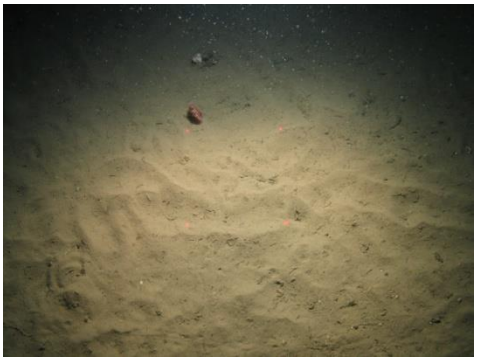
4.2.1 Stations in predicted sand sediment

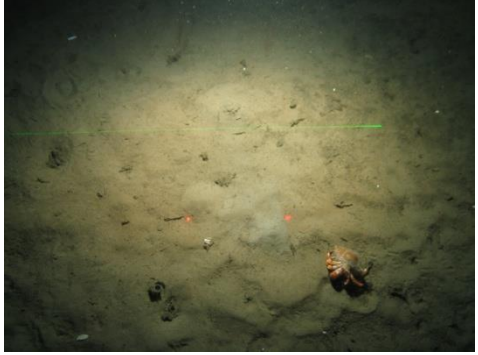
Stn Code	BSH Habitat/Faunal Summary	Still Image
SS02	<p>Muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Pagurus bernhardus</i>, <i>Asterias rubens</i>, <i>Alcyonium digitatum</i>, <i>Hippoglossoides platessoides</i>, <i>Lophius piscatorius</i>)</p>	
SS04	<p>Rippled coarse sand</p> <p>(<i>Alcyonium digitatum</i>, <i>Pagurus bernhardus</i>, <i>Luidia sarsi</i>, <i>Alcyonidium diaphanum</i>)</p>	
SS07	<p>Rippled sand</p> <p>(<i>Luidia sarsi</i>, <i>Spatangus purpureus</i>, <i>Pennatula phosphorea</i>, <i>Pagurus bernhardus</i>)</p>	
SS10	<p>Rippled sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Pagurus bernhardus</i>, <i>Asterias rubens</i>, <i>Alcyonium digitatum</i>, <i>Alcyonidium diaphanum</i>, <i>Spatangus purpureus</i>)</p>	

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS13	Muddy sand (<i>Pennatula phosphorea</i> , <i>Spatangus purpureus</i> , <i>Liocarcinus</i> sp.)	
SS16	Shelly sand (<i>Spatangus purpureus</i>)	
SS18	Muddy sand (<i>Pennatula phosphorea</i> , <i>Alcyonium digitatum</i> , <i>Pagurus bernhardus</i> , <i>Asterias rubens</i>)	
SS20	Rippled sand (<i>Spatangus purpureus</i> , <i>Pennatula phosphorea</i>)	


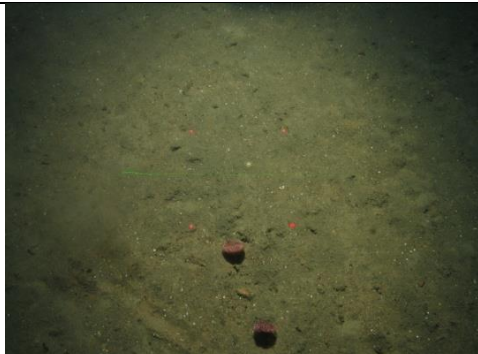

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS21	<p>Slightly shelly sand <i>(Spatangus purpureus, Pennatula phosphorea, Aequipecten opercularis, Pagurus bernhardus, Microstomus kitt)</i></p>	
SS25	<p>Rippled sand <i>(Spatangus purpureus, Pennatula phosphorea, Astropecten irregularis, Pagurus bernhardus, Asterias rubens, Aequipecten opercularis, Echinus esculentus)</i></p>	
SS26	<p>Muddy sand with patches of pebble and cobble <i>(Pennatula phosphorea, Ophiura sp., Aequipecten opercularis, Alcyonium sp., Paguridae)</i></p>	
SS28	<p>Rippled muddy sand <i>(Asterias rubens, Pennatula phosphorea, Pagurus bernhardus, Spatangus purpureus)</i></p>	

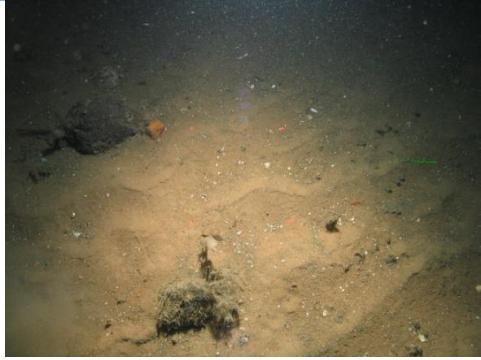
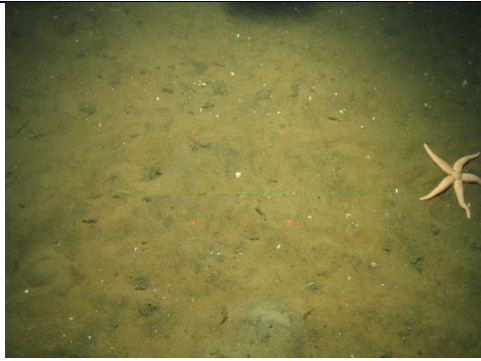

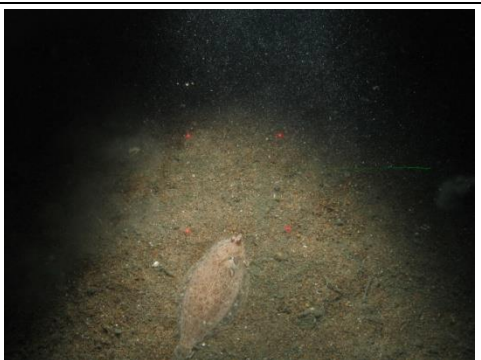
Stn Code	BSH Habitat/Faunal Summary	Still Image
SS31	<p>Muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Pagurus bernhardus</i>, <i>Aequipecten opercularis</i>, <i>Astropecten irregularis</i>, <i>Epizoanthus incrustatus</i>, <i>Microstomus kitt</i>)</p>	
SS35	<p>Rippled muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Spatangus purpureus</i>, <i>Alcyonidium diaphanum</i>, <i>Asterias rubens</i>, <i>Alcyonium</i> sp.)</p>	
SS40	<p>Muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Spatangus purpureus</i>, <i>Asterias rubens</i>)</p>	
SS41	<p>Rippled muddy sand</p> <p>(<i>Myxine glutinosa</i>, <i>Luidia sarsi</i>, <i>Pennatula phosphorea</i>, <i>Asterias rubens</i>, <i>Limanda limanda</i>)</p>	


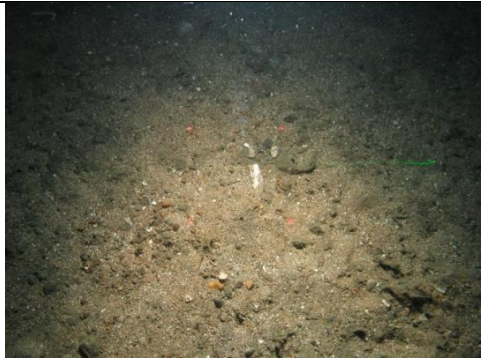
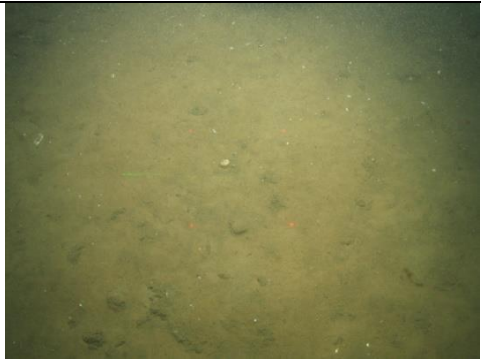
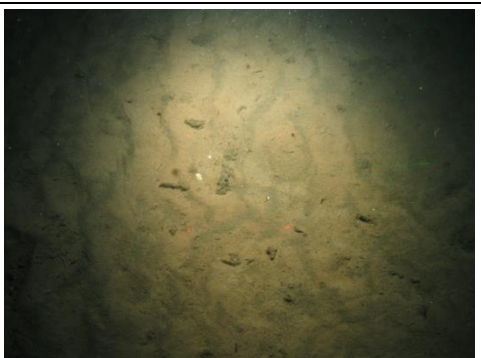
Stn Code	BSH Habitat/Faunal Summary	Still Image
SS43	<p>Muddy sand with patches of pebble and cobble</p> <p>(<i>Spatangus purpureus</i>, <i>Buccinum undatum</i>, <i>Pennatula phosphorea</i>, Paguridae)</p>	
SS46	<p>Muddy sand</p> <p>(<i>Alcyonium</i> sp., <i>Asterias rubens</i>, <i>Spatangus purpureus</i>, <i>Epizoanthus incrustatus</i>)</p>	
SS54	<p>Muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Pagurus bernhardus</i>, <i>Spatangus purpureus</i>, <i>Astropecten irregularis</i>)</p>	
SS59	<p>Rippled muddy sand</p> <p>(<i>Astropecten irregularis</i>, <i>Pennatula phosphorea</i>, <i>Alcyonium</i> sp., <i>Epizoanthus incrustatus</i>, Paguridae)</p>	



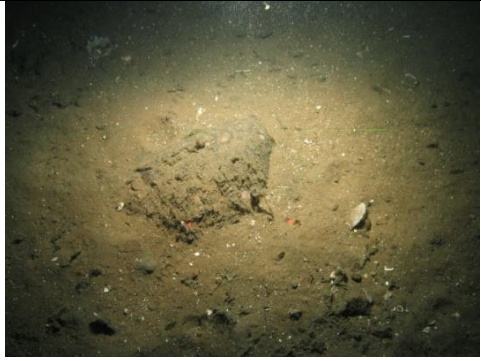

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS62	<p>Rippled muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Spatangus purpureus</i>, <i>Astropecten irregularis</i>, <i>Asterias rubens</i>, <i>Pagurus bernhardus</i>)</p>	


4.2.2 Stations in predicted coarse sediment

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS63	<p>Slightly rippled sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Microstomus kitt</i>, <i>Trisopterus minutus</i>, <i>Alcyonium digitatum</i>, <i>Pagurus bernhardus</i>)</p>	
SS64	<p>Slightly gravelly sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Asterias rubens</i>, <i>Spatangus purpureus</i>)</p>	
SS66	<p>Gravelly sand</p> <p>(<i>Pagurus bernhardus</i>, <i>Asterias rubens</i>, <i>Alcyonium digitatum</i>)</p>	

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS67	Rippled gravelly sand (<i>Alcyonium digitatum</i> , <i>Pennatula phosphorea</i>)	
SS70	Rippled sand (<i>Myxine glutinosa</i> , <i>Pagurus bernhardus</i> , <i>Stichastrella rosea</i> , <i>Alcyonium</i> sp., <i>Spatangus purpureus</i> , <i>Echinus</i> sp., <i>Pagurus prideaux</i>)	
SS77	Rippled coarse sand with occasional pebble and cobble	
SS79	Gravelly sand (<i>Microstomus kitt</i>)	

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS81	Slightly rippled sand (<i>Pleuronectes platessa</i> , <i>Asterias rubens</i> , <i>Spatangus purpureus</i> , <i>Pennatula phosphorea</i>)	 A still image showing a sandy seabed with subtle ripples. The water is slightly turbid, and there are small, dark, irregular shapes scattered across the sand, likely representing the mentioned fauna.
SS88	Rippled coarse sand with occasional pebble and cobble (<i>Buccinum undatum</i> , <i>Nemertesia ramosa</i>)	 A still image of a seabed with coarse sand and visible ripples. Several larger, dark, rounded pebbles and cobbles are scattered throughout the scene. The lighting is somewhat dim, and the water appears slightly murky.
SS91	Muddy sand (<i>Pagurus bernhardus</i> , <i>Alcyonium digitatum</i> , <i>Pennatula phosphorea</i>)	 A still image showing a seabed with a fine, muddy sand texture. The water is very turbid and has a yellowish-green hue. Small, dark, irregular shapes are visible, consistent with the listed species.
SS92	Rippled muddy sand (<i>Pagurus bernhardus</i> , <i>Raja</i> sp.)	 A still image of a seabed with muddy sand and visible ripples. The water is turbid and yellowish. There are some dark, irregular shapes scattered across the sand, likely representing the mentioned fauna.

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS96	Rippled sand (<i>Spatangus purpureus</i> , <i>Buccinum undatum</i> , <i>Alcyonium</i> sp.)	
SS99	Muddy sand (<i>Pagurus bernhardus</i> , <i>Spatangus purpureus</i> , <i>Pennatula phosphorea</i> , <i>Alcyonium digitatum</i> ,	
SS100	Gravelly muddy sand with occasional cobble (<i>Pagurus bernhardus</i> , <i>Flustra foliacea</i> , <i>Echinus esculentus</i>)	
SS101	Gravelly muddy sand (<i>Ophiura</i> sp., <i>Pennatula phosphorea</i>)	

Stn Code	BSH Habitat/Faunal Summary	Still Image
SS102	<p>Rippled muddy sand</p> <p>(<i>Pennatula phosphorea</i>, <i>Asterias rubens</i>, <i>Pagurus bernhardus</i>, <i>Alcyonium digitatum</i>, <i>Aequipecten opercularis</i>)</p>	

4.3 Grab Samples and sediment types

Preliminary observations of the spatial distribution of sediment types (EUNIS Level 3) for each grab sample were also summarised (Figure 6). It should be emphasised that this assignment of EUNIS classification is purely subjective and could change as a result of subsequent laboratory analysis and interpretation.

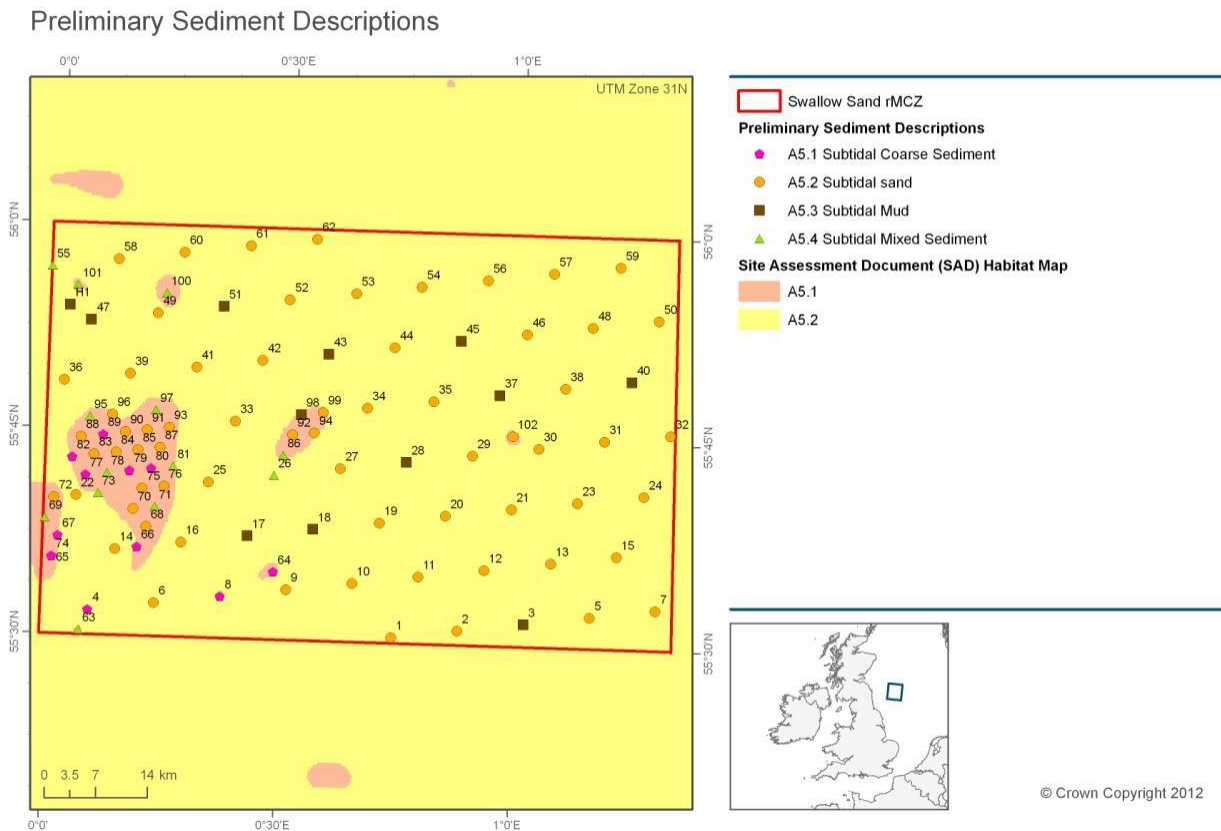


Figure 6. Preliminary assessments of sediment type from Hamon grab samples.

4.4 Preliminary observations of Features of Conservation Interest (FOCI)

The species FOCI *Arctica islandica* was recorded at eight stations sampled on CEND 8/12, supplementing other historical records for the area (Figure 7)

Observations of *Arctica islandica*

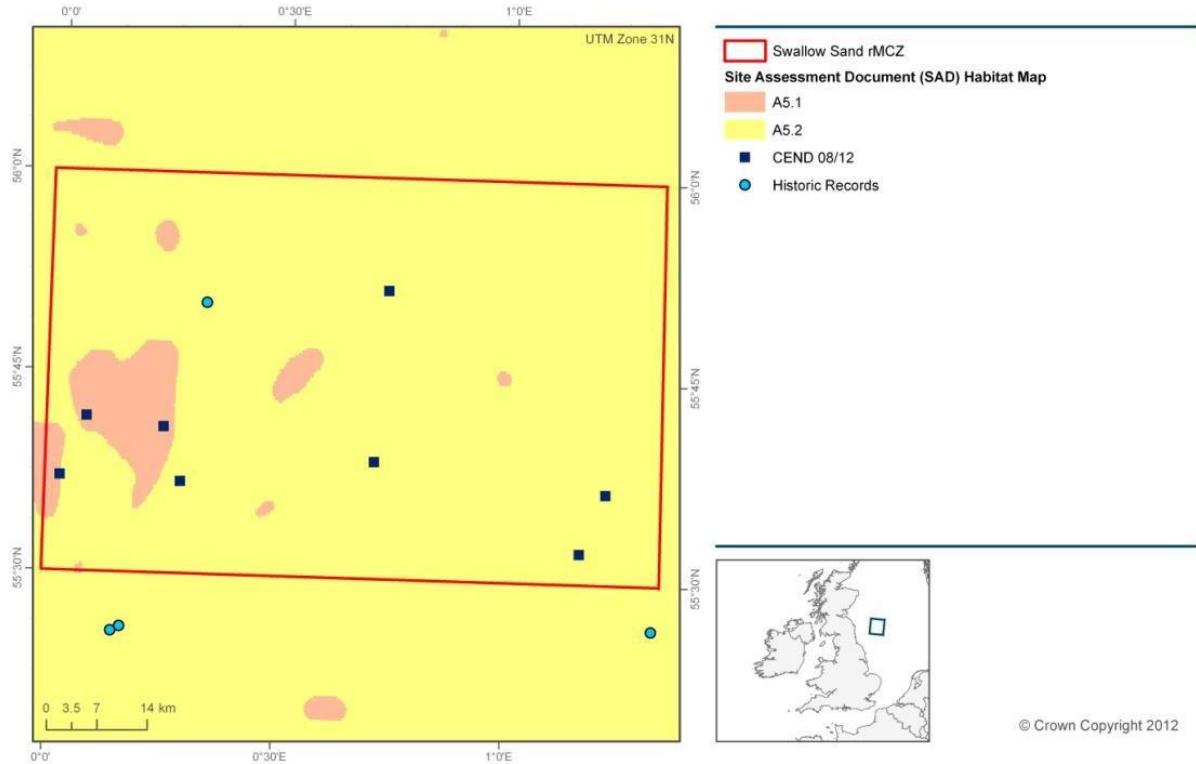


Figure 7. Records of species FOCI (*Arctica islandica*) from historic records and the current survey.

5 Annexes

5.1 RV Cefas Endeavour



Port of registry	Lowestoft
Length OA	73.00 m (excluding stern roller)
Length extreme	73.916 m
Breadth (MLD)	15.80 m
Depth (MLD)	8.20 m
Design draft	5.00 m
Deep draught	5.50 m
LBP	66.50 m
Gross tonnage	2983 tonnes
Net register tonnage	894 tonnes
Net lightship	2436 tonnes
Deadweight @ 5.00 m	784 tonnes
Deadweight @ 5.50 m	1244 tonnes
Displacement @ 5.00 m	3210 tonnes
Displacement @ 5.50 m	3680 tonnes
Builder	Ferguson Shipbuilders Limited, Port Glasgow
Commissioned	2003
Communications	In port BT Tel. Cellphone Voice/Fax/Data Radio TELEX Inmarsat C Fleet 77 (Inmarsat F) and VSAT (eutelsat) internet access
Endurance	42 days
Complement	En-suite accommodation for 16 crew and 19 scientists with dedicated hospital facility
Propulsion System	AC/DC Diesel Electric 3 x diesel electric AC generators, individually raft mounted 2 x tandem electric DC motors Single screw
Power generation	3240 Kw
Power propulsion	2230 Kw
Thrusters	Bow thruster (flush mounted azimuthing) Stern thruster (tunnel)
Trial speed	14.4 knots
Bollard pull	29 tonnes
Call sign	VQHF3
Official number	906938
MMSI	235005270

Lloyds/IMO number	9251107
Side Gantry	7.5 tonne articulated side A-frame
Stern Gantry	25 tonne stern A-frame
Winches	3 x cranes 35 tM, heave compensated 2 x trawl winches 2 x drum winches, (1 double) Double barrel survey winch with motion compensation and slip rings Double barrel survey winch with slip rings Double barrel towing winch with slip rings Side-scan sonar winch with slip rings 3 x Gilson winches (one fitted to stern A-frame)
Transducers/Sea tube	Drop keel to deploy transducers outside the hull boundary layer in addition to hull mounted transducers 1.2 m diameter sea tube/moon-pool
Acoustic equipment	Kongsberg Simrad: HiPAP 500 positioning sonar EK60, 38/120 kHz scientific sounder EA 600, 50/200 kHz scientific sounder Scanmar net mensuration system SH80 high frequency omni- directional sonar EM3002 swathe bathymetry sounder Hull mounted Scanmar fishing computer transducers
Boats	2 x 8 m rigid work and rescue boats with suite of navigational equipment deployed on heave-compensated davits
Laboratories	8 networked laboratories designed for optimum flexibility of purpose 4 serviced deck locations for containerised laboratories
Special features	Dynamic positioning system Intereng anti-roll system Local Area Network with scientific data management system Ship-wide general information system CCTV
Class	LRS 100A1+LMC UMS SCM CCS ICC IP ES(2) DP(CM) ICE class 2

5.2 Camera Sledge

Flash model: Kongsberg 11-242

Underwater lights – Cefas high power LED strip lights

Video and stills camera settings variable depending on underwater visibility and ambient light levels.

5.3 Positioning Software-Tower

Vessel offsets are defined from the pitch roll centre of the vessel – the Common Reference Point (CRP) used by the Tower CEMAP software to calculate offsets.

5.4 Multibeam Bathymetry

Model: Kongsberg EM2040

Frequency: 300kHz; swathe width variable running in hi res equidistant mode

Latency correction not determined – 1pps synchronised time system utilised on vessel.

5.5 Metadata

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	16/05/2012	Swallow Sand	356	SS59	HC	55.96593	1.21346
CEND 8/12	16/05/2012	Swallow Sand	357	SS59	CS	55.96579	1.21376
CEND 8/12	16/05/2012	Swallow Sand	357	SS59	CS	55.96656	1.21308
CEND 8/12	16/05/2012	Swallow Sand	358	SS59-SS57	MB	55.95600	1.06600
CEND 8/12	16/05/2012	Swallow Sand	358	SS59-SS57	MB	55.95760	1.20740
CEND 8/12	17/05/2012	Swallow Sand	359	SS57	HC	55.95620	1.06996
CEND 8/12	16/05/2012	Swallow Sand	360	SS59-SS56	MB	55.94500	0.92303
CEND 8/12	16/05/2012	Swallow Sand	360	SS59-SS56	MB	55.95700	1.06800
CEND 8/12	17/05/2012	Swallow Sand	361	SS56	HC	55.94598	0.92685
CEND 8/12	17/05/2012	Swallow Sand	362	SS56-SS54	MB	55.95320	0.78020
CEND 8/12	17/05/2012	Swallow Sand	362	SS56-SS54	MB	55.94602	0.92311
CEND 8/12	17/05/2012	Swallow Sand	363	SS54	HC	55.93589	0.78399
CEND 8/12	17/05/2012	Swallow Sand	364	SS54	CS	55.93253	0.78565
CEND 8/12	17/05/2012	Swallow Sand	364	SS54	CS	55.93543	0.78407
CEND 8/12	17/05/2012	Swallow Sand	365	SS54-SS53	MB	55.94290	0.63226
CEND 8/12	17/05/2012	Swallow Sand	365	SS54-SS53	MB	55.93777	0.78106
CEND 8/12	17/05/2012	Swallow Sand	366	SS53	HC	55.92544	0.64212
CEND 8/12	17/05/2012	Swallow Sand	367	SS53-SS52	MB	55.91424	0.49449
CEND 8/12	17/05/2012	Swallow Sand	367	SS53-SS52	MB	55.92565	0.63226
CEND 8/12	17/05/2012	Swallow Sand	368	SS52	HC	55.91497	0.49869
CEND 8/12	17/05/2012	Swallow Sand	369	ss52-ss62	MB	55.99180	0.55290
CEND 8/12	17/05/2012	Swallow Sand	369	ss52-ss62	MB	55.91646	0.49925
CEND 8/12	17/05/2012	Swallow Sand	370	SS62	HC	55.98974	0.55291
CEND 8/12	17/05/2012	Swallow Sand	371	SS62	CS	55.98997	0.55312
CEND 8/12	17/05/2012	Swallow Sand	371	SS62	CS	55.98907	0.55293
CEND 8/12	17/05/2012	Swallow Sand	372	ss62-ss61	MB	55.97870	0.40657
CEND 8/12	17/05/2012	Swallow Sand	372	ss62-ss61	MB	55.98550	0.54540
CEND 8/12	17/05/2012	Swallow Sand	373	SS61	HC	55.97902	0.41071
CEND 8/12	17/05/2012	Swallow Sand	374	ss61-ss60	MB	55.96770	0.26300
CEND 8/12	17/05/2012	Swallow Sand	374	ss61-ss60	MB	55.98006	0.40982
CEND 8/12	17/05/2012	Swallow Sand	375	SS60	HC	55.96789	0.26707
CEND 8/12	17/05/2012	Swallow Sand	376	ss60-ss51	MB	55.90237	0.35898
CEND 8/12	17/05/2012	Swallow Sand	376	ss60-ss51	MB	55.96597	0.26747
CEND 8/12	17/05/2012	Swallow Sand	377	SS51	HC	55.90415	0.35618
CEND 8/12	17/05/2012	Swallow Sand	378	ss51-ss100	MB	55.91831	0.22695
CEND 8/12	17/05/2012	Swallow Sand	378	ss51-ss100	MB	55.90305	0.35451
CEND 8/12	17/05/2012	Swallow Sand	379	SS100	HC	55.91814	0.23141
CEND 8/12	17/05/2012	Swallow Sand	380	ss100	CS	55.91732	0.23053
CEND 8/12	17/05/2012	Swallow Sand	380	ss100	CS	55.91816	0.23121
CEND 8/12	17/05/2012	Swallow Sand	381	ss100-ss49	MB	55.89210	0.21280
CEND 8/12	17/05/2012	Swallow Sand	381	ss100-ss49	MB	55.91680	0.23560
CEND 8/12	17/05/2012	Swallow Sand	382	SS49	HC	55.89346	0.21373
CEND 8/12	17/05/2012	Swallow Sand	383	ss49-ss58	MB	55.95720	0.12170
CEND 8/12	17/05/2012	Swallow Sand	383	ss49-ss58	MB	55.89660	0.20950
CEND 8/12	17/05/2012	Swallow Sand	384	SS58	HC	55.95698	0.12468
CEND 8/12	17/05/2012	Swallow Sand	385	ss58-ss47	MB	55.88110	0.06990
CEND 8/12	17/05/2012	Swallow Sand	385	ss58-ss47	MB	55.95510	0.12010
CEND 8/12	17/05/2012	Swallow Sand	386	SS47	HC	55.88235	0.07052
CEND 8/12	17/05/2012	Swallow Sand	387	ss47-swhole	MB	55.89650	0.02985
CEND 8/12	17/05/2012	Swallow Sand	387	ss47-swhole	MB	55.88400	0.06760
CEND 8/12	17/05/2012	Swallow Sand	389	SWHOLE	HC	55.89933	0.02285
CEND 8/12	17/05/2012	Swallow Sand	389	SWHOLE	HC	55.89970	0.02309
CEND 8/12	17/05/2012	Swallow Sand	390	SWHOLE	MB	55.92610	0.04070
CEND 8/12	17/05/2012	Swallow Sand	390	SWHOLE	MB	55.90250	0.02370
CEND 8/12	17/05/2012	Swallow Sand	391	SS101	HC	55.92370	0.03869
CEND 8/12	17/05/2012	Swallow Sand	392	SS101	CS	55.92352	0.03791

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	17/05/2012	Swallow Sand	392	SS101	CS	55.92346	0.03775
CEND 8/12	17/05/2012	Swallow Sand	392	SS101	CS	55.92308	0.03664
CEND 8/12	17/05/2012	Swallow Sand	393	SS101-SS55	MB	55.94810	0.02100
CEND 8/12	17/05/2012	Swallow Sand	393	SS101-SS55	MB	55.92360	0.03387
CEND 8/12	17/05/2012	Swallow Sand	394	SS55	HC	55.94586	-0.01830
CEND 8/12	17/05/2012	Swallow Sand	395	SWHOLE MB	MB	55.81970	0.08750
CEND 8/12	17/05/2012	Swallow Sand	395	SWHOLE MB	MB	55.94800	0.01710
CEND 8/12	17/05/2012	Swallow Sand	396	SS36	HC	55.80767	0.01704
CEND 8/12	17/05/2012	Swallow Sand	397	SS36-SS39	MB	55.81840	0.16290
CEND 8/12	17/05/2012	Swallow Sand	397	SS36-SS39	MB	55.81060	0.02090
CEND 8/12	17/05/2012	Swallow Sand	398	SS39	HC	55.81848	0.15949
CEND 8/12	17/05/2012	Swallow Sand	399	SS39-SS41	MB	55.82950	0.30500
CEND 8/12	17/05/2012	Swallow Sand	399	SS39-SS41	MB	55.81800	0.16370
CEND 8/12	17/05/2012	Swallow Sand	400	SS41	HC	55.82927	0.30179
CEND 8/12	17/05/2012	Swallow Sand	401	SS41	CS	55.82960	0.30166
CEND 8/12	17/05/2012	Swallow Sand	401	SS41	CS	55.82912	0.30208
CEND 8/12	17/05/2012	Swallow Sand	402	SS41-SS42	MB	55.84029	0.44821
CEND 8/12	17/05/2012	Swallow Sand	402	SS41-SS42	MB	55.82790	0.30630
CEND 8/12	18/05/2012	Swallow Sand	403	SS42	HC	55.84043	0.44420
CEND 8/12	17/05/2012	Swallow Sand	404	SS42-SS43	MB	55.85059	0.59036
CEND 8/12	17/05/2012	Swallow Sand	404	SS42-SS43	MB	55.84230	0.45350
CEND 8/12	18/05/2012	Swallow Sand	405	SS43	HC	55.85086	0.58697
CEND 8/12	18/05/2012	Swallow Sand	406	SS43	CS	55.85017	0.58599
CEND 8/12	18/05/2012	Swallow Sand	406	SS43	CS	55.85112	0.58699
CEND 8/12	18/05/2012	Swallow Sand	407	SS43-SS44	MB	55.85140	0.73270
CEND 8/12	18/05/2012	Swallow Sand	407	SS43-SS44	MB	55.85184	0.58774
CEND 8/12	18/05/2012	Swallow Sand	408	SS44	HC	55.86139	0.72926
CEND 8/12	18/05/2012	Swallow Sand	409	SS44-SS45	MB	55.87179	0.87530
CEND 8/12	18/05/2012	Swallow Sand	409	SS44-SS45	MB	55.85530	0.73357
CEND 8/12	18/05/2012	Swallow Sand	410	SS40	HC	55.87168	0.87234
CEND 8/12	18/05/2012	Swallow Sand	411	SS45-SS46	MB	55.89209	1.01856
CEND 8/12	18/05/2012	Swallow Sand	411	SS45-SS46	MB	55.87283	0.87650
CEND 8/12	18/05/2012	Swallow Sand	412	SS46	HC	55.88203	1.01482
CEND 8/12	18/05/2012	Swallow Sand	413	SS46	CS	55.88207	1.01517
CEND 8/12	18/05/2012	Swallow Sand	413	SS46	CS	55.88142	1.01351
CEND 8/12	18/05/2012	Swallow Sand	414	SS46-SS48	MB	55.89180	1.16230
CEND 8/12	18/05/2012	Swallow Sand	414	SS46-SS48	MB	55.87998	1.01260
CEND 8/12	18/05/2012	Swallow Sand	415	SS48	HC	55.89193	1.15691
CEND 8/12	18/05/2012	Swallow Sand	416	SS48-SS50	MB	55.90190	1.30370
CEND 8/12	18/05/2012	Swallow Sand	416	SS48-SS50	MB	55.89110	1.16360
CEND 8/12	18/05/2012	Swallow Sand	417	SS50	HC	55.90197	1.29956
CEND 8/12	18/05/2012	Swallow Sand	418	SS50-SS40	MB	55.82530	1.24250
CEND 8/12	18/05/2012	Swallow Sand	418	SS50-SS40	MB	55.90159	1.30076
CEND 8/12	18/05/2012	Swallow Sand	419	SS40	HC	55.82717	1.24409
CEND 8/12	18/05/2012	Swallow Sand	420	SS40	CS	55.82765	1.24347
CEND 8/12	18/05/2012	Swallow Sand	420	SS40	CS	55.82690	1.24434
CEND 8/12	18/05/2012	Swallow Sand	421	SS40-SS38	MB	55.81720	1.09780
CEND 8/12	18/05/2012	Swallow Sand	421	SS40-SS38	MB	55.82443	1.24216
CEND 8/12	18/05/2012	Swallow Sand	422	SS38	HC	55.81697	1.10124
CEND 8/12	18/05/2012	Swallow Sand	423	SS38-SS37	MB	55.80700	0.95620
CEND 8/12	18/05/2012	Swallow Sand	423	SS38-SS37	MB	55.81779	1.10143
CEND 8/12	18/05/2012	Swallow Sand	424	SS37	HC	55.80721	0.95911
CEND 8/12	18/05/2012	Swallow Sand	425	SS37-SS35	MB	55.79700	0.81420
CEND 8/12	18/05/2012	Swallow Sand	425	SS37-SS35	MB	55.80826	0.95565
CEND 8/12	18/05/2012	Swallow Sand	426	SS35	HC	55.79720	0.81673
CEND 8/12	18/05/2012	Swallow Sand	427	SS35	CS	55.80721	0.95911
CEND 8/12	18/05/2012	Swallow Sand	427	SS35	CS	55.79695	0.81571
CEND 8/12	18/05/2012	Swallow Sand	428	SS35-SS99	MB	55.78650	0.67180

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	18/05/2012	Swallow Sand	428	SS35-SS99	MB	55.79790	0.80970
CEND 8/12	18/05/2012	Swallow Sand	429	SS34	HC	55.78682	0.67410
CEND 8/12	18/05/2012	Swallow Sand	430	SS34 - SS99	MB	55.77910	0.57600
CEND 8/12	18/05/2012	Swallow Sand	430	SS34 - SS99	MB	55.78810	0.66420
CEND 8/12	18/05/2012	Swallow Sand	431	SS99	HC	55.77970	0.57904
CEND 8/12	18/05/2012	Swallow Sand	432	SS99	CS	0.00000	0.00000
CEND 8/12	18/05/2012	Swallow Sand	432	SS99	CS	55.77976	0.57731
CEND 8/12	18/05/2012	Swallow Sand	433	SS99 -SS94	MB	55.75360	0.56070
CEND 8/12	18/05/2012	Swallow Sand	433	SS99 -SS94	MB	55.77850	0.57130
CEND 8/12	18/05/2012	Swallow Sand	434	SS94	HC	55.75455	0.56095
CEND 8/12	18/05/2012	Swallow Sand	435	SS94-SS26	MB	55.70030	0.47610
CEND 8/12	18/05/2012	Swallow Sand	435	SS94-SS26	MB	55.75230	0.59060
CEND 8/12	18/05/2012	Swallow Sand	436	SS26	HC	55.70167	0.47764
CEND 8/12	18/05/2012	Swallow Sand	437	SS26	CS	55.70175	0.47793
CEND 8/12	18/05/2012	Swallow Sand	437	SS26	CS	55.70113	0.47879
CEND 8/12	18/05/2012	Swallow Sand	438	SS26-SS86	MB	55.72800	0.49660
CEND 8/12	18/05/2012	Swallow Sand	438	SS26-SS86	MB	55.70300	0.48180
CEND 8/12	18/05/2012	Swallow Sand	439	SS86	HC	55.72615	0.49607
CEND 8/12	18/05/2012	Swallow Sand	440	SS86-SS92	MB	55.75230	0.51490
CEND 8/12	18/05/2012	Swallow Sand	440	SS86-SS92	MB	55.72890	0.49910
CEND 8/12	18/05/2012	Swallow Sand	441	SS92	HC	55.75138	0.51439
CEND 8/12	18/05/2012	Swallow Sand	442	SS92	CS	55.72615	0.49607
CEND 8/12	18/05/2012	Swallow Sand	442	SS92	CS	55.75100	0.51526
CEND 8/12	18/05/2012	Swallow Sand	443	SS92-SS98	MB	55.77720	0.53280
CEND 8/12	18/05/2012	Swallow Sand	443	SS92-SS98	MB	55.75390	0.51990
CEND 8/12	15/08/2012	Swallow Sand	444	SS98	HC	55.77626	0.53195
CEND 8/12	18/05/2012	Swallow Sand	445	SS98-SS33	MB	55.77660	0.38850
CEND 8/12	18/05/2012	Swallow Sand	445	SS98-SS33	MB	55.76550	0.52810
CEND 8/12	18/05/2012	Swallow Sand	446	SS33	HC	55.76550	0.39002
CEND 8/12	18/05/2012	Swallow Sand	447	SS33-SS97	MB	55.77950	0.21520
CEND 8/12	18/05/2012	Swallow Sand	447	SS33-SS97	MB	55.76650	0.38740
CEND 8/12	18/05/2012	Swallow Sand	448	SS97	HC	55.77571	0.21809
CEND 8/12	18/05/2012	Swallow Sand	449	SS97-SS96	MB	55.76830	0.11980
CEND 8/12	18/05/2012	Swallow Sand	449	SS97-SS96	MB	55.77635	0.21120
CEND 8/12	19/05/2012	Swallow Sand	450	SS96	HC	55.76833	0.12392
CEND 8/12	19/05/2012	Swallow Sand	451	ss96	CS	55.76790	0.12321
CEND 8/12	19/05/2012	Swallow Sand	451	ss96	CS	55.76853	0.12432
CEND 8/12	19/05/2012	Swallow Sand	452	SS96-SS95	MB	55.76458	0.07295
CEND 8/12	19/05/2012	Swallow Sand	452	SS96-SS95	MB	55.76957	0.12360
CEND 8/12	19/05/2012	Swallow Sand	453	ss95	HC	55.76473	0.07609
CEND 8/12	19/05/2012	Swallow Sand	454	SS95-SS88	MB	55.73845	0.05695
CEND 8/12	19/05/2012	Swallow Sand	454	SS95-SS88	MB	55.76335	0.07740
CEND 8/12	19/05/2012	Swallow Sand	455	ss88	HC	55.73961	0.05826
CEND 8/12	19/05/2012	Swallow Sand	456	ss88	CS	55.73886	0.05684
CEND 8/12	19/05/2012	Swallow Sand	456	ss88	CS	55.73954	0.05801
CEND 8/12	19/05/2012	Swallow Sand	457	SS88-SS82	MB	55.71310	0.03831
CEND 8/12	19/05/2012	Swallow Sand	457	SS88-SS82	MB	55.73740	0.06151
CEND 8/12	19/05/2012	Swallow Sand	458	ss82	HC	55.71468	0.04119
CEND 8/12	19/05/2012	Swallow Sand	458	ss82	HC	55.71465	0.04115
CEND 8/12	19/05/2012	Swallow Sand	458	ss82	HC	55.71476	0.04127
CEND 8/12	19/05/2012	Swallow Sand	459	SS82-SS77	MB	55.69199	0.07291
CEND 8/12	19/05/2012	Swallow Sand	459	SS82-SS77	MB	55.71280	0.04480
CEND 8/12	19/05/2012	Swallow Sand	460	ss77	HC	55.69358	0.07103
CEND 8/12	19/05/2012	Swallow Sand	461	ss77	CS	55.69396	0.06987
CEND 8/12	19/05/2012	Swallow Sand	461	ss77	CS	55.69350	0.06904
CEND 8/12	19/05/2012	Swallow Sand	462	SS77-SS83	MB	55.72070	0.09045
CEND 8/12	19/05/2012	Swallow Sand	462	SS77-SS83	MB	55.69600	0.06707
CEND 8/12	19/05/2012	Swallow Sand	463	ss83	HC	55.71887	0.08752

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	19/05/2012	Swallow Sand	464	SS83-SS89	MB	55.74560	0.10667
CEND 8/12	19/05/2012	Swallow Sand	464	SS83-SS89	MB	55.72220	0.09098
CEND 8/12	19/05/2012	Swallow Sand	465	ss89	HC	55.74353	0.10592
CEND 8/12	19/05/2012	Swallow Sand	466	SS89-SS90	MB	55.74420	0.15448
CEND 8/12	19/05/2012	Swallow Sand	466	SS89-SS90	MB	55.74420	0.11010
CEND 8/12	19/05/2012	Swallow Sand	468	SS90-SS84	MB	55.72090	0.13340
CEND 8/12	19/05/2012	Swallow Sand	468	SS90-SS84	MB	55.74660	0.15570
CEND 8/12	19/05/2012	Swallow Sand	469	ss84	HC	55.72245	0.13538
CEND 8/12	19/05/2012	Swallow Sand	470	SS84-SS78	MB	55.65720	0.11510
CEND 8/12	19/05/2012	Swallow Sand	470	SS84-SS78	MB	55.72160	0.13700
CEND 8/12	19/05/2012	Swallow Sand	471	ss78	HC	55.69727	0.11737
CEND 8/12	19/05/2012	Swallow Sand	472	SS78-SS73	MB	55.67020	0.09815
CEND 8/12	19/05/2012	Swallow Sand	472	SS78-SS73	MB	55.69340	0.11660
CEND 8/12	19/05/2012	Swallow Sand	473	ss73	HC	55.67247	0.09961
CEND 8/12	19/05/2012	Swallow Sand	474	SS73-SS22	MB	55.66800	0.04856
CEND 8/12	19/05/2012	Swallow Sand	474	SS73-SS22	MB	55.67310	0.09854
CEND 8/12	19/05/2012	Swallow Sand	475	ss22	HC	55.66877	0.05237
CEND 8/12	19/05/2012	Swallow Sand	476	SS72	HC	55.66502	0.00523
CEND 8/12	19/05/2012	Swallow Sand	477	SS72-SS69	MB	55.63920	-0.01349
CEND 8/12	19/05/2012	Swallow Sand	477	SS72-SS69	MB	55.66266	0.00413
CEND 8/12	19/05/2012	Swallow Sand	478	SS69	HC	55.64008	-0.01248
CEND 8/12	19/05/2012	Swallow Sand	479	SS69-SS67	MB	55.61800	0.01840
CEND 8/12	19/05/2012	Swallow Sand	479	SS69-SS67	MB	55.63860	-0.00930
CEND 8/12	19/05/2012	Swallow Sand	480	SS67	HC	55.61887	0.01683
CEND 8/12	19/05/2012	Swallow Sand	482	SS67-SS65	MB	55.59460	0.00590
CEND 8/12	19/05/2012	Swallow Sand	482	SS67-SS65	MB	55.61890	0.01770
CEND 8/12	19/05/2012	Swallow Sand	483	SS65	HC	55.59356	0.00493
CEND 8/12	19/05/2012	Swallow Sand	485	SS65-SS74	MB	55.67720	0.14820
CEND 8/12	19/05/2012	Swallow Sand	485	SS65-SS74	MB	55.59520	0.00070
CEND 8/12	19/05/2012	Swallow Sand	486	SS74	HC	55.67614	0.14723
CEND 8/12	19/05/2012	Swallow Sand	487	SS74-SS79	MB	55.70250	0.16570
CEND 8/12	19/05/2012	Swallow Sand	487	SS74-SS79	MB	55.67750	0.14860
CEND 8/12	19/05/2012	Swallow Sand	488	SS79	HC	55.70094	0.16543
CEND 8/12	19/02/2012	Swallow Sand	489	SS79	CS	55.70115	0.16488
CEND 8/12	19/02/2012	Swallow Sand	489	SS79	CS	55.70204	0.16537
CEND 8/12	19/05/2012	Swallow Sand	490	SS79-SS85	MB	55.72970	0.18460
CEND 8/12	19/05/2012	Swallow Sand	490	SS79-SS85	MB	55.70420	0.16680
CEND 8/12	19/05/2012	Swallow Sand	491	SS85	HC	55.72610	0.18230
CEND 8/12	19/05/2012	Swallow Sand	492	SS85-SS91	MB	55.75240	0.20150
CEND 8/12	19/05/2012	Swallow Sand	492	SS85-SS91	MB	55.72950	0.18510
CEND 8/12	19/05/2012	Swallow Sand	493	SS91	HC	55.75060	0.20068
CEND 8/12	19/05/2012	Swallow Sand	494	SS91	CS	55.75048	0.20048
CEND 8/12	19/05/2012	Swallow Sand	494	SS91	CS	55.75179	0.20143
CEND 8/12	19/05/2012	Swallow Sand	495	SS91-SS93	MB	55.75490	0.25150
CEND 8/12	19/05/2012	Swallow Sand	495	SS91-SS93	MB	55.75340	0.20510
CEND 8/12	19/05/2012	Swallow Sand	496	SS93	HC	55.75481	0.24759
CEND 8/12	19/05/2012	Swallow Sand	497	SS93-SS87	MB	55.72830	0.22890
CEND 8/12	19/05/2012	Swallow Sand	497	SS93-SS87	MB	55.75320	0.24270
CEND 8/12	19/05/2012	Swallow Sand	498	SS87	HC	55.72990	0.22975
CEND 8/12	19/05/2012	Swallow Sand	499	SS87-SS80	MB	55.70370	0.21200
CEND 8/12	19/05/2012	Swallow Sand	499	SS87-SS80	MB	55.72980	0.22520
CEND 8/12	19/05/2012	Swallow Sand	500	SS80	HC	55.70469	0.21228
CEND 8/12	19/05/2012	Swallow Sand	501	SS80-SS75	MB	55.67900	0.19370
CEND 8/12	19/05/2012	Swallow Sand	501	SS80-SS75	MB	55.70180	0.21360
CEND 8/12	19/05/2012	Swallow Sand	502	SS75	HC	55.67970	0.19425
CEND 8/12	19/05/2012	Swallow Sand	503	SS75-SS70	MB	55.65460	0.17630
CEND 8/12	19/05/2012	Swallow Sand	503	SS75-SS70	MB	55.67750	0.19540
CEND 8/12	19/05/2012	Swallow Sand	504	SS70	HC	55.65472	0.17643

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	19/05/2012	Swallow Sand	505	SS70	CS	55.65515	0.17588
CEND 8/12	19/05/2012	Swallow Sand	505	SS70	CS	55.65382	0.17662
CEND 8/12	19/05/2012	Swallow Sand	506	SS70-SS14	MB	55.60390	0.14000
CEND 8/12	19/05/2012	Swallow Sand	506	SS70-SS14	MB	55.64910	0.17680
CEND 8/12	19/05/2012	Swallow Sand	507	SS14	HC	55.60500	0.14117
CEND 8/12	19/05/2012	Swallow Sand	508	SS14-SS66	MB	55.60880	0.18930
CEND 8/12	19/05/2012	Swallow Sand	508	SS14-SS66	MB	55.60650	0.14620
CEND 8/12	19/05/2012	Swallow Sand	509	SS66	HC	55.60878	0.18754
CEND 8/12	19/05/2012	Swallow Sand	510	C5650	CS	55.60850	0.18718
CEND 8/12	19/05/2012	Swallow Sand	510	C5650	CS	55.60929	0.18747
CEND 8/12	19/05/2012	Swallow Sand	511	SS66-SS16	MB	55.61627	0.28495
CEND 8/12	19/05/2012	Swallow Sand	511	SS66-SS16	MB	55.61154	0.19292
CEND 8/12	20/05/2012	Swallow Sand	512	ss16	HC	55.61584	0.28232
CEND 8/12	20/05/2012	Swallow Sand	513	ss16	CS	55.61584	0.28232
CEND 8/12	20/05/2012	Swallow Sand	513	ss16	CS	55.61565	0.28186
CEND 8/12	20/05/2012	Swallow Sand	514	SS16-SS68	MB	55.63410	0.20242
CEND 8/12	20/05/2012	Swallow Sand	514	SS16-SS68	MB	55.61738	0.28090
CEND 8/12	20/05/2012	Swallow Sand	515	ss68	HC	55.63360	0.20563
CEND 8/12	20/05/2012	Swallow Sand	516	SS68-SS71	MB	55.65925	0.22086
CEND 8/12	20/05/2012	Swallow Sand	516	SS68-SS71	MB	55.63240	0.20720
CEND 8/12	20/05/2012	Swallow Sand	517	ss71	HC	55.65837	0.22330
CEND 8/12	20/05/2012	Swallow Sand	518	SS71-SS76	MB	55.68505	0.24199
CEND 8/12	20/05/2012	Swallow Sand	518	SS71-SS76	MB	55.65987	0.22483
CEND 8/12	20/05/2012	Swallow Sand	519	ss76	HC	55.68330	0.24163
CEND 8/12	20/05/2012	Swallow Sand	520	SS76-SS81	MB	55.70960	0.25760
CEND 8/12	20/05/2012	Swallow Sand	520	SS76-SS81	MB	55.68750	0.24251
CEND 8/12	20/05/2012	Swallow Sand	521	SS81	HC	55.70835	0.25954
CEND 8/12	20/05/2012	Swallow Sand	522	ss81	CS	55.70805	0.25929
CEND 8/12	20/05/2012	Swallow Sand	522	ss81	CS	55.70885	0.25967
CEND 8/12	20/05/2012	Swallow Sand	523	SS81-SS25	MB	55.68991	0.33904
CEND 8/12	20/05/2012	Swallow Sand	523	SS81-SS25	MB	55.70990	0.26046
CEND 8/12	20/05/2012	Swallow Sand	524	SS25	HC	55.69048	0.33613
CEND 8/12	20/05/2012	Swallow Sand	525	ss25	CS	55.69041	0.33599
CEND 8/12	20/05/2012	Swallow Sand	525	ss25	CS	55.69122	0.33577
CEND 8/12	20/05/2012	Swallow Sand	526	SS25-SS17	MB	55.62527	0.42573
CEND 8/12	20/05/2012	Swallow Sand	526	SS25-SS17	MB	55.69303	0.33766
CEND 8/12	20/05/2012	Swallow Sand	527	ss17	HC	55.62687	0.42461
CEND 8/12	20/05/2012	Swallow Sand	528	SS17-SS18	MB	55.63800	0.56831
CEND 8/12	20/05/2012	Swallow Sand	528	SS17-SS18	MB	55.62838	0.43327
CEND 8/12	20/05/2012	Swallow Sand	529	SS18	HC	55.63765	0.56549
CEND 8/12	20/05/2012	Swallow Sand	530	SS18	CS	55.63785	0.56582
CEND 8/12	20/05/2012	Swallow Sand	530	SS18	CS	55.63678	0.56512
CEND 8/12	20/05/2012	Swallow Sand	531	SS18-SS27	MB	55.71383	0.62061
CEND 8/12	20/05/2012	Swallow Sand	531	SS18-SS27	MB	55.67281	0.58906
CEND 8/12	20/05/2012	Swallow Sand	532	SS27	HC	55.71215	0.61984
CEND 8/12	20/05/2012	Swallow Sand	533	SS27-SS28	MB	55.72278	0.76468
CEND 8/12	20/05/2012	Swallow Sand	533	SS27-SS28	MB	55.73103	0.62368
CEND 8/12	20/05/2012	Swallow Sand	534	SS28	HC	55.72260	0.76183
CEND 8/12	20/05/2012	Swallow Sand	535	SS28	CS	55.72279	0.76193
CEND 8/12	20/05/2012	Swallow Sand	535	SS28	CS	55.72193	0.76217
CEND 8/12	20/05/2012	Swallow Sand	536	SS28-SS19	MB	55.64700	0.70680
CEND 8/12	20/05/2012	Swallow Sand	536	SS28-SS19	MB	55.71340	0.75740
CEND 8/12	20/05/2012	Swallow Sand	537	SS19	HC	55.64791	0.70781
CEND 8/12	20/05/2012	Swallow Sand	538	SS19-SS20	MB	55.65870	0.85210
CEND 8/12	20/05/2012	Swallow Sand	538	SS19-SS20	MB	55.64920	0.71440
CEND 8/12	20/05/2012	Swallow Sand	539	SS20	HC	55.65837	0.84926
CEND 8/12	20/05/2012	Swallow Sand	541	SS20	CS	55.65688	0.84786
CEND 8/12	20/05/2012	Swallow Sand	541	SS20	CS	55.65769	0.84852

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	20/05/2012	Swallow Sand	542	SS20-SS29	MB	55.73380	0.90470
CEND 8/12	20/05/2012	Swallow Sand	542	SS20-SS29	MB	55.65960	0.84990
CEND 8/12	20/05/2012	Swallow Sand	543	SS29	HC	55.73276	0.90406
CEND 8/12	20/05/2012	Swallow Sand	544	SS29-SS102	MB	55.75820	0.99070
CEND 8/12	20/05/2012	Swallow Sand	544	SS29-SS102	MB	55.73450	0.90760
CEND 8/12	20/05/2012	Swallow Sand	545	SS102	CS	55.75750	0.98932
CEND 8/12	20/05/2012	Swallow Sand	546	SS102	CS	55.75753	0.98878
CEND 8/12	20/05/2012	Swallow Sand	547	SS102-SS30	MB	55.74220	1.04860
CEND 8/12	20/05/2012	Swallow Sand	547	SS102-SS30	MB	55.75890	0.99170
CEND 8/12	20/05/2012	Swallow Sand	548	SS30	HC	55.74316	1.04665
CEND 8/12	20/05/2012	Swallow Sand	549	SS30-SS24	MB	55.66740	0.99040
CEND 8/12	20/05/2012	Swallow Sand	549	SS30-SS24	MB	55.74150	1.04190
CEND 8/12	20/05/2012	Swallow Sand	550	SS21	HC	55.66887	0.99101
CEND 8/12	20/05/2012	Swallow Sand	551	SS21	CS	55.66876	0.99163
CEND 8/12	20/05/2012	Swallow Sand	551	SS21	CS	55.66828	0.99039
CEND 8/12	20/05/2012	Swallow Sand	552	SS24-SS23	MB	55.67850	1.13500
CEND 8/12	20/05/2012	Swallow Sand	552	SS24-SS23	MB	55.66510	0.99230
CEND 8/12	20/05/2012	Swallow Sand	553	SS23	HC	55.67863	1.13319
CEND 8/12	20/05/2012	Swallow Sand	554	SS23-SS31	MB	55.75500	1.18940
CEND 8/12	20/05/2012	Swallow Sand	554	SS23-SS31	MB	55.68090	1.13460
CEND 8/12	20/05/2012	Swallow Sand	555	SS31	HC	55.75418	1.18786
CEND 8/12	20/05/2012	Swallow Sand	556	SS31	CS	55.75373	0.00000
CEND 8/12	20/05/2012	Swallow Sand	556	SS31	CS	55.76257	0.00000
CEND 8/12	20/05/2012	Swallow Sand	557	SS31-SS32	MB	55.76290	1.33320
CEND 8/12	20/05/2012	Swallow Sand	557	SS31-SS32	MB	55.75070	1.19350
CEND 8/12	20/05/2012	Swallow Sand	558	SS32	HC	55.76257	1.33066
CEND 8/12	20/05/2012	Swallow Sand	559	SS32-SS24	MB	55.68711	1.27395
CEND 8/12	20/05/2012	Swallow Sand	559	SS32-SS24	MB	55.75920	1.33080
CEND 8/12	20/05/2012	Swallow Sand	560	SS24	HC	55.68815	1.27540
CEND 8/12	20/05/2012	Swallow Sand	561	SS24	CS	55.68721	1.27399
CEND 8/12	20/05/2012	Swallow Sand	561	SS24	CS	55.68788	1.27477
CEND 8/12	21/05/2012	Swallow Sand	562	SS24-SS07	MB	55.54817	1.30577
CEND 8/12	21/05/2012	Swallow Sand	562	SS24-SS07	MB	55.68772	1.28032
CEND 8/12	21/05/2012	Swallow Sand	563	SS07	HC	55.54954	1.30558
CEND 8/12	21/05/2012	Swallow Sand	564	SS07	CS	55.54837	1.30397
CEND 8/12	21/05/2012	Swallow Sand	564	SS07	CS	55.54908	1.30480
CEND 8/12	21/05/2012	Swallow Sand	565	SS07-SS05	MB	55.53959	1.16023
CEND 8/12	21/05/2012	Swallow Sand	565	SS07-SS05	MB	55.55129	1.30511
CEND 8/12	21/05/2012	Swallow Sand	567	SS05-SS15	MB	55.61596	1.22124
CEND 8/12	21/05/2012	Swallow Sand	567	SS05-SS15	MB	55.54179	1.16574
CEND 8/12	21/05/2012	Swallow Sand	568	ss15	HC	55.61412	1.21966
CEND 8/12	21/05/2012	Swallow Sand	569	SS15-SS13	MB	55.60380	1.07431
CEND 8/12	21/05/2012	Swallow Sand	569	SS15-SS13	MB	55.65159	1.21854
CEND 8/12	21/05/2012	Swallow Sand	570	ss13	HC	55.60432	1.07859
CEND 8/12	21/05/2012	Swallow Sand	571	ss13	CS	55.60436	1.07894
CEND 8/12	21/05/2012	Swallow Sand	571	ss13	CS	55.60404	1.07747
CEND 8/12	21/05/2012	Swallow Sand	572	SS15-SS03	MB	55.52962	1.02284
CEND 8/12	21/05/2012	Swallow Sand	572	SS15-SS03	MB	55.59723	1.06840
CEND 8/12	21/05/2012	Swallow Sand	574	SS03-SS02	MB	55.51930	0.87712
CEND 8/12	21/05/2012	Swallow Sand	574	SS03-SS02	MB	55.53130	1.02190
CEND 8/12	21/05/2012	Swallow Sand	575	SS02	HC	55.51962	0.88116
CEND 8/12	21/05/2012	Swallow Sand	576	SS02	CS	55.51978	0.88121
CEND 8/12	21/05/2012	Swallow Sand	576	SS02	CS	55.51891	0.88233
CEND 8/12	21/05/2012	Swallow Sand	577	SS02-SS12	MB	55.59587	0.93675
CEND 8/12	21/05/2012	Swallow Sand	577	SS02-SS12	MB	55.51820	0.88324
CEND 8/12	21/05/2012	Swallow Sand	578	SS12	HC	55.59401	0.93557
CEND 8/12	21/05/2012	Swallow Sand	579	SS12-SS11	MB	55.58450	0.78820
CEND 8/12	21/05/2012	Swallow Sand	579	SS12-SS11	MB	55.59250	0.93570

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	21/05/2012	Swallow Sand	580	SS11	HC	55.58371	0.79457
CEND 8/12	21/05/2012	Swallow Sand	581	SS11-SS1	MB	55.50790	0.73890
CEND 8/12	21/05/2012	Swallow Sand	581	SS11-SS1	MB	55.58260	0.79430
CEND 8/12	21/05/2012	Swallow Sand	582	SS1	HC	55.50911	0.74044
CEND 8/12	21/05/2012	Swallow Sand	584	SS1-SS10	MB	55.57440	0.65060
CEND 8/12	21/05/2012	Swallow Sand	584	SS1-SS10	MB	55.51270	0.73650
CEND 8/12	21/05/2012	Swallow Sand	585	SS10	HC	55.57335	0.65302
CEND 8/12	21/05/2012	Swallow Sand	586	SS10	CS	55.57212	0.65196
CEND 8/12	21/05/2012	Swallow Sand	586	SS10	CS	55.57316	0.65267
CEND 8/12	21/05/2012	Swallow Sand	587	SS10-SS09	MB	55.56270	0.50880
CEND 8/12	21/05/2012	Swallow Sand	587	SS10-SS09	MB	55.57520	0.63810
CEND 8/12	21/05/2012	Swallow Sand	588	SS9	HC	55.56301	0.51118
CEND 8/12	21/05/2012	Swallow Sand	589	SS09-SS64	MB	55.58770	0.47750
CEND 8/12	21/05/2012	Swallow Sand	589	SS09-SS64	MB	55.56440	0.50970
CEND 8/12	21/05/2012	Swallow Sand	590	SS64	HC	55.58401	0.48238
CEND 8/12	21/05/2012	Swallow Sand	591	SS64	CS	55.58403	0.48235
CEND 8/12	21/05/2012	Swallow Sand	591	SS64	CS	55.58480	0.48174
CEND 8/12	21/05/2012	Swallow Sand	592	SS64-SS08	MB	55.55140	0.36730
CEND 8/12	21/05/2012	Swallow Sand	592	SS64-SS08	MB	55.58470	0.47310
CEND 8/12	21/05/2012	Swallow Sand	593	SS08	HC	55.55215	0.37062
CEND 8/12	21/05/2012	Swallow Sand	594	SS08-SS06	MB	55.54110	0.22590
CEND 8/12	21/05/2012	Swallow Sand	594	SS08-SS06	MB	55.55210	0.36110
CEND 8/12	21/05/2012	Swallow Sand	595	SS6T	HC	55.54138	0.22845
CEND 8/12	21/05/2012	Swallow Sand	596	SS06-SS63	MB	55.50670	0.06610
CEND 8/12	21/05/2012	Swallow Sand	596	SS06-SS63	MB	55.53480	0.20230
CEND 8/12	21/05/2012	Swallow Sand	597	SS63	HC	55.50542	0.06945
CEND 8/12	21/05/2012	Swallow Sand	599	SS63-SS04	MB	55.53180	0.08783
CEND 8/12	21/05/2012	Swallow Sand	599	SS63-SS04	MB	55.50670	0.07545
CEND 8/12	21/05/2012	Swallow Sand	600	SS4	HC	55.53033	0.08734
CEND 8/12	21/05/2012	Swallow Sand	601	SS04	CS	55.53061	0.08732
CEND 8/12	21/05/2012	Swallow Sand	601	SS04	CS	55.52983	0.08794
CEND 8/12	22/05/2012	Swallow Sand	603	TO SOL	MB	55.60797	0.00332
CEND 8/12	22/05/2012	Swallow Sand	603	TO SOL	MB	55.53020	0.05582
CEND 8/12	22/05/2012	Swallow Sand	604	SSL1	MB	55.60962	0.00298
CEND 8/12	22/05/2012	Swallow Sand	604	SSL1	MB	55.60837	0.28229
CEND 8/12	22/05/2012	Swallow Sand	604	SSL1	MB	55.60633	0.28910
CEND 8/12	22/05/2012	Swallow Sand	604	SSL1	MB	55.60799	-0.00164
CEND 8/12	22/05/2012	Swallow Sand	605	SSL10200-SSL2	MB	55.65577	0.01174
CEND 8/12	22/05/2012	Swallow Sand	605	SSL10200-SSL2	MB	55.61115	-0.00775
CEND 8/12	22/05/2012	Swallow Sand	606	SSL2	MB	55.65931	0.29068
CEND 8/12	22/05/2012	Swallow Sand	606	SSL2	MB	55.65768	0.00201
CEND 8/12	22/05/2012	Swallow Sand	606	SSL2	MB	55.65942	-0.00489
CEND 8/12	22/05/2012	Swallow Sand	606	SSL2	MB	55.66121	0.29000
CEND 8/12	22/05/2012	Swallow Sand	607	SSL20200-SSL3	MB	55.69072	-0.01495
CEND 8/12	22/05/2012	Swallow Sand	607	SSL20200-SSL3	MB	55.66080	-0.00107
CEND 8/12	22/05/2012	Swallow Sand	608	SSL3	MB	55.69556	0.01036
CEND 8/12	22/05/2012	Swallow Sand	608	SSL3	MB	55.69903	0.32496
CEND 8/12	22/05/2012	Swallow Sand	608	SSL3	MB	55.69748	0.33065
CEND 8/12	22/05/2012	Swallow Sand	608	SSL3	MB	55.69387	0.01422
CEND 8/12	22/05/2012	Swallow Sand	609	SSC30400	MB	55.70100	0.32630
CEND 8/12	22/05/2012	Swallow Sand	609	SSC30400	MB	55.96700	0.01413
CEND 8/12	22/05/2012	Swallow Sand	610	SSX	MB	55.72483	0.01043
CEND 8/12	22/05/2012	Swallow Sand	610	SSX	MB	55.72270	0.28334
CEND 8/12	22/05/2012	Swallow Sand	610	SSX	MB	55.72090	0.02856
CEND 8/12	22/05/2012	Swallow Sand	610	SSX	MB	55.73230	0.00677
CEND 8/12	22/05/2012	Swallow Sand	610	SSX	MB	55.72140	0.30350
CEND 8/12	22/05/2012	Swallow Sand	610	SSX	MB	55.71890	0.28410
CEND 8/12	22/05/2012	Swallow Sand	612	SSX	MB	55.74156	0.00119

Cruise	Date	Survey Area	Stn No.	Stn. Code	Gear	Latitude	Longitude
CEND 8/12	22/05/2012	Swallow Sand	612	SSX	MB	55.72765	0.00630
CEND 8/12	22/05/2012	Swallow Sand	612	SSX	MB	55.74156	0.00119
CEND 8/12	22/05/2012	Swallow Sand	612	SSX	MB	55.72765	0.00630
CEND 8/12	22/05/2012	Swallow Sand	613	SSX	MB	55.74530	0.16227
CEND 8/12	22/05/2012	Swallow Sand	613	SSX	MB	55.74440	0.31473
CEND 8/12	22/05/2012	Swallow Sand	613	SSX	MB	55.74270	0.31145
CEND 8/12	22/05/2012	Swallow Sand	613	SSX	MB	55.74100	0.01216
CEND 8/12	22/05/2012	Swallow Sand	614	SSX	MB	55.77379	0.13922
CEND 8/12	22/05/2012	Swallow Sand	614	SSX	MB	55.74676	0.15723

5.6 Daily Progress Report

**DAILY LOG
STATUS REPORT
Swallow Sand rMCZ
RV Cefas Endeavour – JNCC – DPR No. 18 – Wednesday 16th May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 18 Date: 16/05/12	Location at 24:00: Swallow Sand rMCZ

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		
NE		
NE		
NE		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		3
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	02:27	Drop camera	
02:27	10:09	Multibeam	
10:09	13:09	Drop camera	
13:09	21:19	Transit	Transit to Swallow Sand rMCZ
21:19	21:55	Hamon grab	
21:55	22:16	Camera sledge	
22:16	24:00	Multibeam	
00:00	02:27	Drop camera	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	09:26	162:26	
Total Operation Sampling (TOSa)	06:24	108:25	
Equipment/Downtime		02:45	
Ship/Plant Downtime		00:00	
Waiting On Weather		02:30	
Transit	08:10	63:59	
Standby Port		00:00	
Others		00:00	
Total:	24:00	381:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	53	164		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	1	1	10	
Groundtruthing (accumulated)	120	53	42	

Weather forecast for the next 24 hours

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Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Continue multibeaming between grab and camera stations at Swallow Sand
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Agreed Changes to Scope/Survey operation priorities

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CEFAS/JNCC Comments

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CEFAS SIC. [REDACTED]

JNCC Rep: [REDACTED]

**DAILY LOG
STATUS REPORT
Swallow Sand rMCZ
RV Cefas Endeavour – JNCC – DPR No. 19 – Thursday 17th May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 19 Date: 17/05/12	Location at 24:00: Swallow Sand

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		3
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	00:35	Hamon grab	
00:35	01:23	Multibeam	
01:23	01:59	Hamon grab	
01:59	02:18	Camera sledge	
02:18	03:08	Multibeam	
03:08	03:24	Hamon grab	
03:24	04:10	Multibeam	
04:10	04:24	Hamon grab	
04:24	05:14	Multibeam	
05:14	05:44	Hamon grab	
05:44	06:51	Multibeam	
06:51	07:11	Hamon grab	
07:11	08:01	Multibeam	
08:01	08:19	Hamon grab	
08:19	09:08	Multibeam	
09:08	09:31	Hamon grab	
09:31	10:16	Multibeam	
10:16	10:27	Hamon grab	
10:27	11:06	Camera sledge	
11:06	11:23	Multibeam	
11:23	11:48	Hamon grab	
11:48	12:36	Multibeam	
12:36	12:55	Hamon grab	
12:55	13:42	Multibeam	
13:42	13:59	Hamon grab	
13:59	14:14	Multibeam	
14:14	14:45	Hamon grab	
14:45	15:01	Camera sledge	
15:01	15:17	Multibeam	

DAILY LOG STATUS REPORT

15:17	15:54	Hamon grab	
15:54	16:11	Camera sledge	
16:11	16:35	Multibeam	
16:35	16:56	Hamon grab	
16:56	17:56	Multibeam	
17:56	18:22	Multibeam	
18:22	19:07	Hamon grab	
19:07	19:55	Multibeam	
19:55	20:14	Hamon grab	
20:14	21:02	Multibeam	
21:02	22:18	Hamon grab	
22:18	23:06	Multibeam	
23:06	23:26	Hamon grab	
23:26	24:00	Multibeam	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	13:05	175:31	
Total Operation Sampling (TOSa)	10:54	119:19	
Equipment/Downtime		02:45	
Ship/Plant Downtime		00:00	
Waiting On Weather		02:30	
Transit		63:59	
Standby Port		00:00	
Others		00:00	
Total:	24:00	405:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	117	1731		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	20	5		
Groundtruthing (accumulated)	140	58	42	

Weather forecast for the next 24 hours

Wind In northwest, easterly or northeasterly 4 or 5, occasionally 6. In southeast, northeasterly 5 or 6, becoming variable 4 later. Moderate or rough sea state. Occasional rain, Moderate or good visibility

Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Agreed Changes to Scope/Survey operation priorities

CEFAS/JNCC Comments

CEFAS SIC... [REDACTED]

JNCC Rep: [REDACTED]

**DAILY LOG
STATUS REPORT
Swallow Sand rMCZ
RV Cefas Endeavour – JNCC – DPR No. 20 – Friday 18th May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 20 Date: 18/05/12	Location at 24:00: 55° 50.3 N 0°25.7 E

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		3
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	00:13	Multibeam	
00:13	00:45	Hamon Grab	
00:45	01:04	Camera sledge	
01:04	01:55	Multibeam	
01:55	02:12	Hamon Grab	
02:12	03:00	Multibeam	
03:00	03:17	Hamon Grab	
03:17	04:04	Multibeam	
04:04	04:34	Hamon Grab	
04:34	04:54	Camera sledge	
04:54	05:45	Multibeam	
05:45	05:48	Hamon Grab	
05:48	06:04	Hamon Grab	
06:04	06:51	Multibeam	
06:51	07:09	Hamon Grab	
07:09	07:58	Multibeam	
07:58	08:36	Hamon Grab	
08:36	08:56	Camera sledge	
08:56	09:46	Multibeam	
09:46	10:02	Hamon Grab	
10:02	10:47	Multibeam	
10:47	11:04	Hamon Grab	
11:04	11:53	Multibeam	
11:53	12:28	Hamon Grab	
12:28	12:49	Camera sledge	
12:49	13:35	Multibeam	
13:35	14:04	Hamon Grab	
14:04	14:34	Multibeam	

DAILY LOG STATUS REPORT

14:34	15:09	Hamon Grab	
15:09	16:05	Camera sledge	
16:05	16:21	Multibeam	
16:21	16:49	Hamon Grab	
16:49	17:31	Multibeam	
17:31	18:02	Hamon Grab	
18:02	18:20	Camera sledge	
18:20	18:36	Multibeam	
18:36	19:03	Hamon Grab	
19:03	19:19	Multibeam	
19:19	19:41	Hamon Grab	
19:41	20:24	Camera sledge	
20:24	20:40	Multibeam	
20:40	21:04	Hamon Grab	
21:04	21:53	Multibeam	
21:53	23:41	Hamon Grab	
23:41	00:00	Multibeam	
00:00	00:13	Multibeam	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	11:42	187:14	
Total Operation Sampling (TOSa)	12:17	131:36	
Equipment/Downtime		02:45	
Ship/Plant Downtime		00:00	
Waiting On Weather		02:30	
Transit		63:59	
Standby Port		00:00	
Others		00:00	
Total:	24:00	429:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	142	1873		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	20	8		
Groundtruthing (accumulated)	160	66	42	

Weather forecast for the next 24 hours

Wind northerly or northeasterly 4 or 5, increasing 6 at times. Moderate occasionally rough sea state. Rain or showers. Visibility moderate or good.

Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Continue multibeam, grab and camera sledge at Swallow Sand.

Agreed Changes to Scope/Survey operation priorities

CEFAS/JNCC Comments

CEFAS SIC..

JNCC Rep:

**DAILY LOG
STATUS REPORT
Swallow Sand rMCZ
RV Cefas Endeavour – JNCC – DPR No. 21 – Saturday 19th May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 21 Date: 19/05/12	Location at 24:00: Swallow Sand rMCZ

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		3
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	00:14	Multibeam	
00:14	00:48	Hamon Grab	
00:48	01:10	Camera sledge	
01:10	01:28	Multibeam	
01:28	01:50	Hamon Grab	
01:50	02:08	Multibeam	
02:08	02:38	Hamon Grab	
02:38	03:00	Camera sledge	
03:00	03:16	Multibeam	
03:16	03:49	Hamon Grab	
03:49	04:06	Multibeam	
04:06	04:57	Hamon Grab	
04:57	05:09	Camera sledge	
05:09	05:36	Multibeam	
05:36	05:43	Hamon Grab	
05:43	05:58	Multibeam	
05:58	06:13	Hamon Grab	
06:13	06:29	Multibeam	
06:29	07:29	Hamon Grab	
07:29	07:47	Multibeam	
07:47	08:06	Hamon Grab	
08:06	08:24	Multibeam	
08:24	08:42	Hamon Grab	
08:42	08:58	Multibeam	
08:58	09:10	Hamon Grab	
09:10	09:40	Multibeam	
09:40	10:34	Hamon Grab	
10:34	10:44	Multibeam	

DAILY LOG STATUS REPORT

10:44	11:09	Hamon Grab	
11:09	11:26	Multibeam	
11:26	12:05	Hamon Grab	
12:05	12:23	Camera sledge	
12:23	12:39	Multibeam	
12:39	13:13	Hamon Grab	
13:13	14:13	Multibeam	
14:13	14:29	Multibeam	
14:29	14:52	Hamon Grab	
14:52	15:11	Multibeam	
15:11	15:47	Hamon Grab	
15:47	16:06	Camera sledge	
16:06	16:25	Multibeam	
16:25	16:44	Hamon Grab	
16:44	17:03	Multibeam	
17:03	17:36	Hamon Grab	
17:36	17:53	Camera sledge	
17:53	18:09	Multibeam	
18:09	18:29	Hamon Grab	
18:29	18:44	Multibeam	
18:44	19:02	Hamon Grab	
19:02	19:18	Multibeam	
19:18	19:36	Hamon Grab	
19:36	19:52	Multibeam	
19:52	20:10	Hamon Grab	
20:10	20:26	Multibeam	
20:26	20:59	Hamon Grab	
20:59	21:19	Camera sledge	
21:19	21:52	Multibeam	
21:52	22:10	Hamon Grab	
22:10	22:26	Multibeam	
22:26	23:01	Hamon Grab	
23:01	23:23	Camera sledge	
23:23	23:56	Multibeam	
23:56	00:00	Hamon Grab	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	09:20	196:34	
Total Operation Sampling (TOSa)	14:40	146:16	
Equipment/Downtime		02:45	
Ship/Plant Downtime			
Waiting On Weather		02:30	
Transit		63:59	
Standby Port			
Others			
Total:	24:00	453:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	93	1966		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	27	8		
Groundtruthing (accumulated)	187	74	42	

Weather forecast for the next 24 hours

Wind northerly or northeasterly 5, decreasing 4. Slight or moderate sea state. Fog patches. Visibility good in north at first otherwise moderate or poor.

Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Continue multibeam, grab and camera sledge at Swallow Sand.

Agreed Changes to Scope/Survey operation priorities

CEFAS/JNCC Comments

Unable to use the camera sledge from around 5am – 12pm due to the weather.

CEFAS SIC.. [REDACTED]

JNCC Rep: [REDACTED]

**DAILY LOG
STATUS REPORT
Swallow Sand rMCZ
RV Cefas Endeavour – JNCC – DPR No. 22 – Sunday 20th May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 22 Date: 20/05/12	Location at 24:00: Swallow Sand rMCZ

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		4
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	00:25	Hamon Grab	
00:25	00:45	Camera Sledge	
00:45	01:15	Multibeam	
01:15	01:33	Hamon Grab	
01:33	01:52	Multibeam	
01:52	02:07	Hamon Grab	
02:07	02:26	Multibeam	
02:26	02:43	Hamon Grab	
02:43	03:02	Multibeam	
03:02	03:11	Hamon Grab	
03:11	03:51	Camera Sledge	
03:51	04:21	Multibeam	
04:21	04:52	Hamon Grab	
04:52	05:11	Camera Sledge	
05:11	06:01	Multibeam	
06:01	06:23	Hamon Grab	
06:23	07:09	Multibeam	
07:09	07:48	Hamon Grab	
07:48	08:30	Camera Sledge	
08:30	08:59	Multibeam	
08:59	09:23	Hamon Grab	
09:23	09:40	Multibeam	
09:40	10:39	Hamon Grab	
10:39	11:01	Camera Sledge	
11:01	11:44	Multibeam	
11:44	12:02	Hamon Grab	
12:02	12:51	Multibeam	
12:51	13:00	Hamon Grab	

DAILY LOG STATUS REPORT

13:00	13:37	CTD	
13:37	13:55	Camera sledge	
13:55	14:45	Multibeam	
14:45	15:00	Hamon Grab	
15:00	15:32	Multibeam	
15:32	16:05	Hamon Grab	
16:05	16:24	Camera Sledge	
16:24	16:47	Multibeam	
16:47	17:06	Hamon Grab	
17:06	17:53	Multibeam	
17:53	18:29	Hamon Grab	
18:29	18:50	Camera Sledge	
18:50	19:39	Multibeam	
19:39	19:54	Hamon Grab	
19:54	20:44	Multibeam	
20:44	21:17	Hamon Grab	
21:17	21:36	Camera Sledge	
21:36	22:25	Multibeam	
22:25	22:43	Hamon Grab	
22:43	23:30	Multibeam	
23:30	23:46	Hamon Grab	
23:46	24:00	Camera Sledge	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	11:38	196:34	
Total Operation Sampling (TOSa)	12:22	157:54	
Equipment/Downtime		15:07	
Ship/Plant Downtime			
Waiting On Weather		02:30	
Transit		63:59	
Standby Port			
Others			
Total:	24:00	477:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	132	2098		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	20	10		
Groundtruthing (accumulated)	207	84	42	

Weather forecast for the next 24 hours

North or northeast 4 or 5, occasionally 6. Slight or moderate sea state. Fog patches. Moderate, occasionally poor visibility

Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Continue multibeam, grab and camera sledge at Swallow Sand.

Agreed Changes to Scope/Survey operation priorities

CEFAS/JNCC Comments

CEFAS SIC. [REDACTED]

JNCC Rep. [REDACTED]

**DAILY LOG
STATUS REPORT
Swallow Sand rMCZ
RV Cefas Endeavour – JNCC – DPR No. 23 – Monday 21st May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 23 Date: 21/05/12	Location at 24:00: Swallow Sand rMCZ

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		4
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	00:19	Camera sledge	
00:19	01:42	Multibeam	
01:42	02:12	Hamon Grab	
02:12	02:34	Camera sledge	
02:34	03:26	Multibeam	
03:26	03:44	Hamon Grab	
03:44	04:30	Multibeam	
04:30	04:45	Hamon Grab	
04:45	05:34	Multibeam	
05:34	06:00	Hamon Grab	
06:00	06:23	Camera sledge	
06:23	07:08	Multibeam	
07:08	07:29	Hamon Grab	
07:29	08:20	Multibeam	
08:20	08:57	Hamon Grab	
08:57	09:17	Camera sledge	
09:17	10:11	Multibeam	
10:11	10:31	Hamon Grab	
10:31	11:22	Multibeam	
11:22	11:41	Hamon Grab	
11:41	12:28	Multibeam	
12:28	12:41	Hamon Grab	
12:41	13:06	CTD	
13:06	13:54	Multibeam	
13:54	14:26	Hamon Grab	

DAILY LOG STATUS REPORT

14:26	14:54	Camera sledge	
14:54	15:40	Multibeam	
15:40	15:55	Hamon Grab	
15:55	16:14	Multibeam	
16:14	16:53	Hamon Grab	
16:53	17:13	Camera sledge	
17:13	17:52	Multibeam	
17:52	18:17	Hamon Grab	
18:17	19:02	Multibeam	
19:02	19:36	Hamon Grab	
19:36	20:30	Multibeam	
20:30	21:00	Hamon Grab	
21:00	21:20	Camera sledge	
21:20	21:36	Multibeam	
21:36	22:09	Hamon Grab	
22:09	22:19	Camera sledge	
22:19	23:01	CTD	
23:01	24:00	Multibeam	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	13:24	221:36	
Total Operation Sampling (TOSa)	10:36	169:14	
Equipment/Downtime		02:45	
Ship/Plant Downtime			
Waiting On Weather		02:30	
Transit		63:59	
Standby Port			
Others			
Total:	24:00	501:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	148	2246		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	16	8		
Groundtruthing (accumulated)	223	92	42	

Weather forecast for the next 24 hours

Wind north or northeast 4 or 5, decreasing 3 for a time. Slight or moderate sea state. Fog patches then fog banks developing occasionally. Moderate, occasionally very poor visibility.

Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Continuing multibeam survey in order to delineate extent of coarse sediment patch. Multibeam lines being run in groups of 3 lines. Heading to Holderness Offshore rMCZ at midnight.

Agreed Changes to Scope/Survey operation priorities

CEFAS/JNCC Comments

CEFAS SIC... [REDACTED]

JNCC Rep: [REDACTED]

**DAILY LOG
STATUS REPORT
Swallow Sands rMCZ
RV Cefas Endeavour – JNCC – DPR No. 24 – Tuesday 22nd May 2012**

Vessel: RV Cefas Endeavour GSM : 07799 773456	Project: MCZ Site Verification CEND 8/12 Satellite Voice Bridge: 00 870 (or 00871) 763998027
Daily Progress Report No. 24 Date: 22/05/12	Location at 24:00: Swallow Sand rMCZ

To Company:	Person:	E-mail:
Cefas		
Cefas		
Cefas		
JNCC		
JNCC		
JNCC		
JNCC		
NE		
NE		

Safety

	Today	To Date
Accidents/Incidents		
Near Misses		
Safety Drills/Induction		4
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
00:00	00:01	Multibeam	
00:01	01:03	Multibeam	
01:03	01:39	Multibeam	
01:39	02:46	Multibeam	
02:46	03:20	Multibeam	
03:20	03:51	Multibeam	
03:51	04:57	Multibeam	
04:57	05:37	Multibeam	
05:37	06:44	Multibeam	
06:44	07:25	Multibeam	
07:25	07:46	Multibeam	
07:46	08:57	Multibeam	
08:57	09:46	Multibeam	
09:46	10:54	Multibeam	
10:54	11:43	Multibeam	
11:43	12:49	Multibeam	
12:49	13:35	Multibeam	
13:35	13:51	Multibeam	
13:51	14:58	Multibeam	
14:58	15:34	Multibeam	
15:34	16:42	Multibeam	
16:42	17:15	Multibeam	

DAILY LOG STATUS REPORT

17:15	18:24	Multibeam	
18:24	18:53	Multibeam	
18:53	19:21	Multibeam	
19:21	20:26	Multibeam	
20:26	21:13	Multibeam	
21:13	22:11	Multibeam	
22:11	22:39	Multibeam	
22:39	24:00	Transit	

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob/Demob		38:15	
Offshore Calibrations		02:49	
Total Operation Survey (TOSu)	22:39	244:15	
Total Operation Sampling (TOSa)		169:14	
Equipment/Downtime		02:45	
Ship/Plant Downtime		00:00	
Waiting On Weather		02:30	
Transit	01:21	65:20	
Standby Port		00:00	
Others		00:00	
Total:	24:00	525:09	

DAILY LOG STATUS REPORT

Overall Progress Geophysical Data Acquisition MBES/Sidescan

Segment/Area/Line	Today (Lkm)	Accum. (Lkm)	Current estimated total (Lkm)	Remarks
Acoustic: Multibeam				
EM2040	228	2474		
Acoustic: Sidescan Sonar				
Edgetech 4200	24	35		

Overall Progress Groundtruthing Samples

Action	HC	CS	DC	Remarks
Groundtruthing	0	0	0	
Groundtruthing (accumulated)	223	92	42	

Weather forecast for the next 24 hours

Wind: north or northeast 4 or 5 becoming variable 3 or 4 later. Slight sea state. Fog banks developing. Moderate or occasionally poor visibility.

Planned operation for the next 24 hours (00:00 to 24:00 on 30th April 2012)

Transit to Holderness Offshore. Arrive at around 8.30 am. Take a CTD and begin survey. Multibeam between grab and camera sledge stations

Agreed Changes to Scope/Survey operation priorities

CEFAS/JNCC Comments

CEFAS SIC.: [REDACTED]

JNCC Rep: [REDACTED]

About us

Cefas is a multi-disciplinary scientific research and consultancy centre providing a comprehensive range of services in fisheries management, environmental monitoring and assessment, and aquaculture to a large number of clients worldwide.

We have more than 500 staff based in 2 laboratories, our own ocean-going research vessel, and over 100 years of fisheries experience.

We have a long and successful track record in delivering high-quality services to clients in a confidential and impartial manner.

(www.cefas.defra.gov.uk)

Cefas Technology Limited (CTL) is a wholly owned subsidiary of Cefas specialising in the application of Cefas technology to specific customer needs in a cost-effective and focussed manner.

CTL systems and services are developed by teams that are experienced in fisheries, environmental management and aquaculture, and in working closely with clients to ensure that their needs are fully met.

(www.cefastechnology.co.uk)

Customer focus

With our unique facilities and our breadth of expertise in environmental and fisheries management, we can rapidly put together a multi-disciplinary team of experienced specialists, fully supported by our comprehensive in-house resources.

Our existing customers are drawn from a broad spectrum with wide ranging interests. Clients include:

- international and UK government departments
- the European Commission
- the World Bank
- Food and Agriculture Organisation of the United Nations (FAO)
- oil, water, chemical, pharmaceutical, agro-chemical, aggregate and marine industries
- non-governmental and environmental organisations
- regulators and enforcement agencies
- local authorities and other public bodies

We also work successfully in partnership with other organisations, operate in international consortia and have several joint ventures commercialising our intellectual property

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