CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE LOWESTOFT LABORATORY, SUFFOLK, NR33 0HT

2016 RESEARCH VESSEL PROGRAMME

REPORT: *RV Cefas Endeavour*: Survey C END 15 - 2016.

STAFF:

Name	Role
Alex Callaway SiC	Scientist in Charge
Alison Pettafor	Lead Hydrographer
Night Shift – 00:00 – 12:00	
Manuel Nicolaus	Shift Lead
Freya Goodsir	Marine Policy Advisor
Tim Bean	Fisheries Scientist
Denise Doran	Exotoxicologist
Ken May	Hydrographer/Technician
Day Shift – 12:00 – 00:00	
John Bignell	Shift Lead
Sara Losada Rivas	Marine Chemist
Stefan Bolam	Benthic Ecologist/Disposal site lead
Bill Meadows	Hydrographer/Technician
Dave Pearce	Oceanographer/Lander Expert
Michelle Pond	Fisheries Scientist

DURATION: 11/07/2016 – 15/07/2016

LOCATION: Offshore Plymouth/Rame Head

AIMS:

Seabed characterisation for Marine Management Organisation utilising multibeam echosounder (MBES), grab samples, video samples and 2 m beam trawl sample data.

NARRATIVE & PRELIMINARY RESULTS:

11/07/2016
The vessel departed Fowey 07:00, 11/07/2016 and transited to the site. A calibration for the multibeam echosounder (MBES) was undertaken before the MBES survey was carried out. The MBES survey was completed at 04:00, 12/07/2013 (**Error! Reference source not found.**).

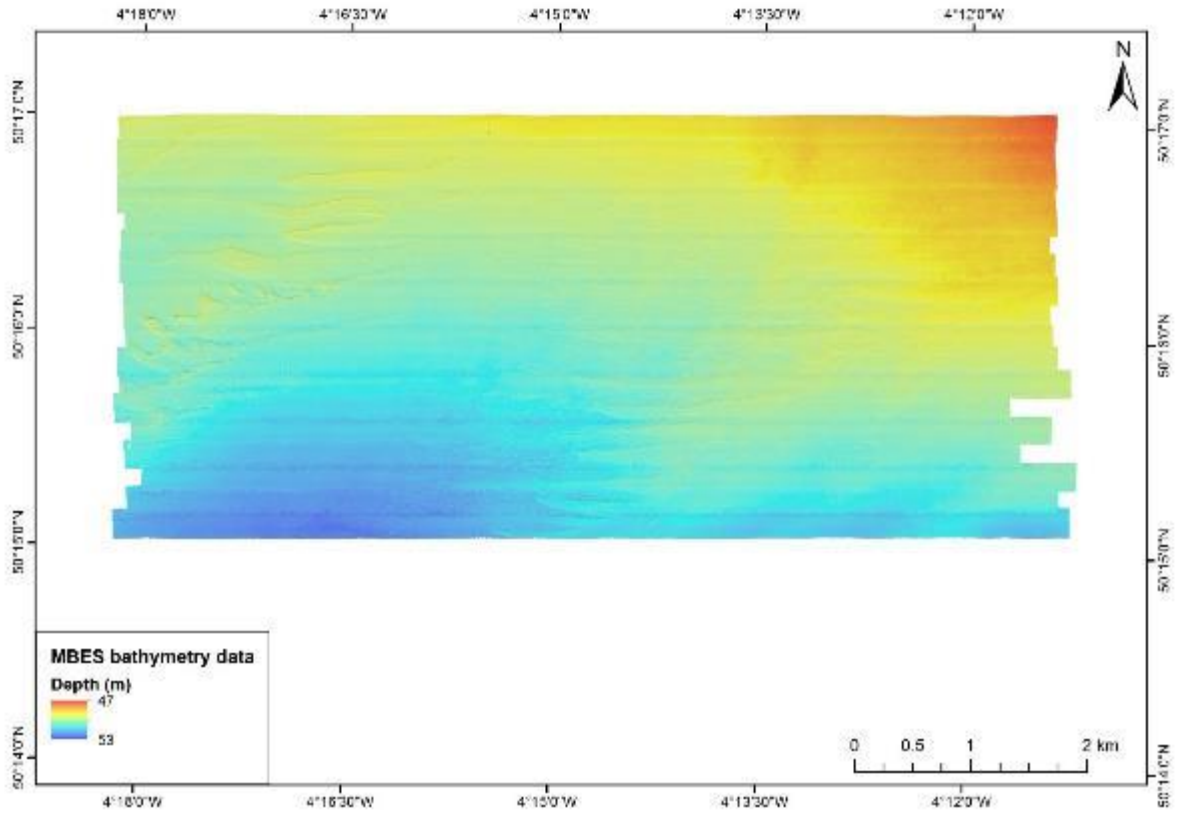


Figure 1. MBES bathymetry data from characterisation site

The MBES data revealed an area of seabed with low topographic complexity and a depth range of only 6 m. The shallowest area was found in the north east deepening to south west (
Figure 1). Grab sample stations were planned using a regular triangular lattice grid to provide maximum coverage and were compared against the MBES backscatter data (
Figure 2) prior to beginning grab operations. The MBES backscatter data revealed a mostly homogeneous seabed with slight variations in the roughness characteristics of the seabed. These variations indicated some coarse sediment may be present but there was no evidence of rocky areas. Therefore, the original sample distribution was retained.

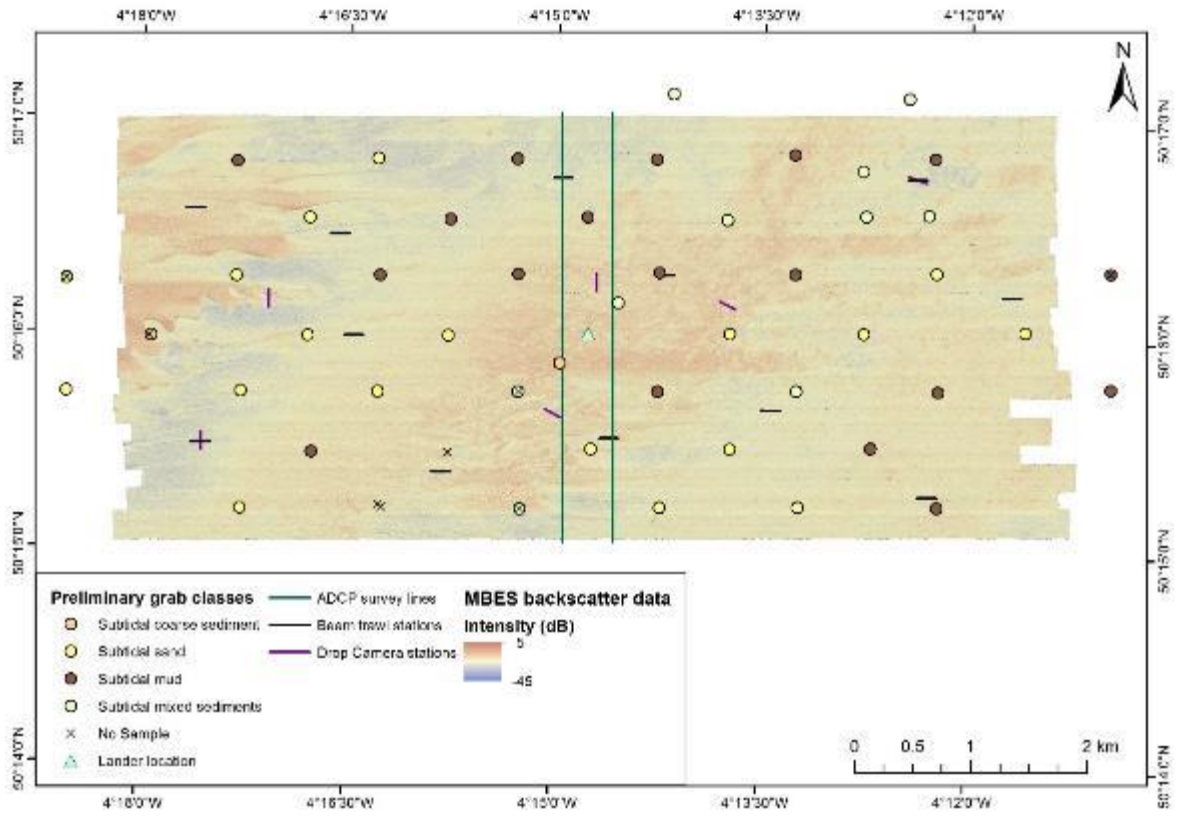


Figure 2. MBES backscatter data from characterisation site with ground-truthing sample distribution and ADCP survey line location. Preliminary sediment class and from grab samples provided

12/07/2016

The vessel then proceeded to carry out grabbing operations utilising the Hamon and Shipek grabs due to the acoustic data indicating that the sediment would be unsuitable for successful Day grab deployment across the site. The site for the Lander was predetermined. However, the suitability of the site was confirmed following investigation of the MBES data. The MBES backscatter data revealed a high level of trawling had taken place in the site as evidenced by trawl scars on the seabed (Figure 3). The trawl scars proliferated in the east and west of the site but were absent from the central area. Changes of direction in the trawl scars indicated that fishing vessels were actively avoiding the central region of higher backscatter (Figure 2). Therefore, the central location for Lander station was retained. At 10:00, Lander deployment operations were carried out until 12:30 when grab operations recommenced. Grab operations at priority stations were completed at 23:30, 12/07/2016 (
Figure 2).

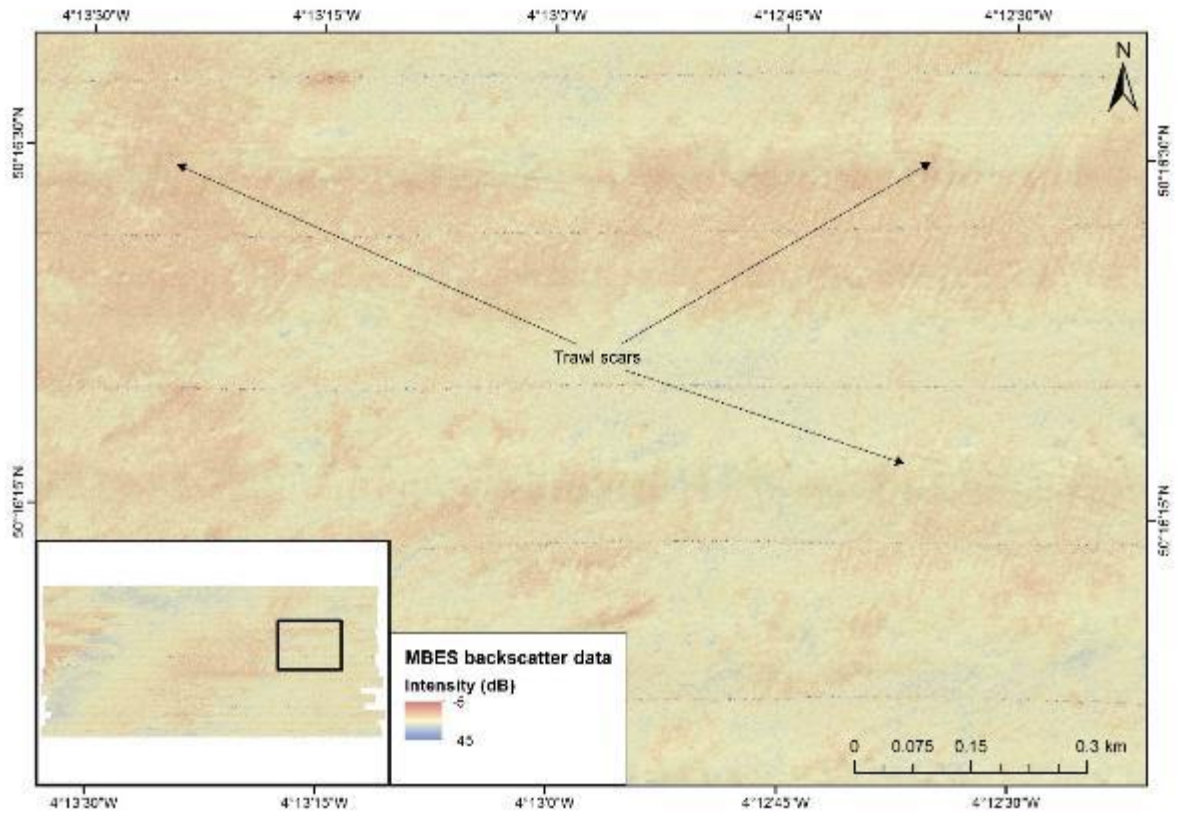


Figure 3. Trawl scars observed in MBES backscatter data

13/07/2016

Drop camera operations commenced at 01:00, 13/07/2016 and continued until 04:45 completing six stations. Following completion of the video surveys the 2 m 'Jennings' beam trawl was deployed at a further six stations with processing taking place on board. Beam trawling operations were completed at 10:45, 13/07/2016. This completed the initial scheme of work enabling a further 20 low priority grab stations to be visited. These stations were completed by 21:50, 13/07/2016 with only two stations unsuccessful and returning no sample. A total of 48 macrofauna, 48 particle size analysis and 50 contaminants (metals/organics) samples were collected. A further six beam trawl stations were then visited to improve coverage of epifauna data across the site, these were completed at 03:00, 14/07/2016 (
Figure 2).
Appendix A provides example images from the grab and video samples.

14/07/2016

To provide an alternative data source in the advent of loss or failure of the Lander instruments an Acoustic Doppler Current Profiler (ADCP) survey was carried out using a hull-mounted ADCP. This involved running a two line circuit for 14 hours perpendicular to the main tidal flow direction. The ADCP survey was completed at 16:50, 14/07/2016 (**Error! Reference source not found.**). Four additional CSEMP stations were then visited before transiting to Portland to meet the Pilot vessel at 06:00, 15/07/2016.

15/07/2016

Vessel demobilised and staff travelled to Lowestoft without incident.

Alex Callaway
Scientist In Charge

SEEN IN DRAFT

Master:
Senior Fishing Mate:

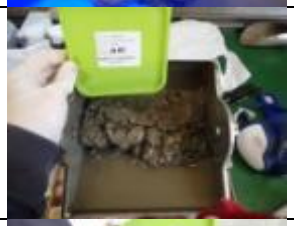
INITIALLED:

DISTRIBUTION:

Appendix A

Example images from grab samples and video tows. Images reveal a mixed substratum comprising gravel, sand and mud in varying quantities with some cobbles retrieved in grab samples.

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC01_STN_4_A1			
CEND1516_RHC01_STN_5_A1			
CEND1516_RHC02_STN_6_A1			
CEND1516_RHC02_STN_7_A1			
CEND1516_RHC03_STN_8_A1			
CEND1516_RHC03_STN_9_A1			
CEND1516_RHC04_STN_10_A1			

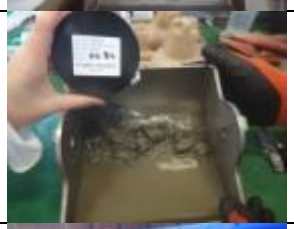
Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC04_STN_11_A1			
CEND1516_RHC05_STN_12_A1_HG			
CEND1516_RHC05_STN_13_A1			
CEND1516_RHC06_STN_14_A1			
CEND1516_RHC06_STN_14_B1			
CEND1516_RHC06_STN_15_A2			
CEND1516_RHC27_STN_16_A2	No Image		
CEND1516_RHC27_STN_17_A1			

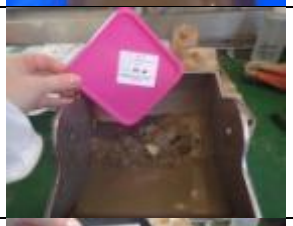
Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC27_STN_17_B1			
CEND1516_RHC12_STN_18_A1			
CEND1516_RHC12_STN_19_A1			
CEND1516_RHC11_STN_20_A1			
CEND1516_RHC11_STN_21_A1			
CEND1516_RHC10_STN_22_A1			
CEND1516_RHC10_STN_23_A1			
CEND1516_RHC25_STN_24_A1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC09_STN_30_A1			
CEND1516_RHC09_STN_31_A1			
CEND1516_RHC09_STN_31_A1			
CEND1516_RHC08_STN_32_A1			
CEND1516_RHC08_STN_33_A1			
CEND1516_RHC07_STN_34_A1 Wrong Station number on label: Stn 34			
CEND1516_RHC07_STN_35_A1 Wrong Station number on PSA and 5 mm labels: Stn 35			
CEND1516_RHC29_STN_36_A2			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC29_STN_37_A2			
CEND1516_RHC30_STN_38_A1			
CEND1516_RHC30_STN_39_A1			
CEND1516_RHC13_STN_40_A1			
CEND1516_RHC13_STN_41_A1			
CEND1516_RHC13_STN_41_B1			
CEND1516_RHC14_STN_42_A1			
CEND1516_RHC14_STN_42_B1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC14_STN_43_A1			
CEND1516_RHC15_STN_44_A3			
CEND1516_RHC15_STN_45_A2			
CEND1516_RHC15_STN_45_B1			
CEND1516_RHC26_STN_46_A1			
CEND1516_RHC26_STN_47_A3			
CEND1516_RHC16_STN_48_A1			
CEND1516_RHC16_STN_49_A1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC16_STN_49_B1			
CEND1516_RHC17_STN_51_A1			
CEND1516_RHC18_STN_52_A1			
CEND1516_RHC18_STN_53_A1			
CEND1516_RHC18_STN_53_B1			
CEND1516_RHC28_STN_54_A1			
CEND1516_RHC28_STN_54_B1			
CEND1516_RHC28_STN_55_A1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC24_STN_56_A1			
CEND1516_RHC24_STN_57_A1			
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CEND1516_RHC23_STN_58_A1			
CEND1516_RHC23_STN_58_B1			
CEND1516_RHC23_STN_59_A1			
CEND1516_RHC22_STN_60_A1			
CEND1516_RHC22_STN_61_B1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC21_STN_62_A1			
CEND1516_RHC21_STN_62_B1			
CEND1516_RHC21_STN_63_A2			
CEND1516_RHC20_STN_65_A1			
CEND1516_RHC20_STN_65_B1			
CEND1516_RHC20_STN_65_C3			
CEND1516_RHC19_STN_66_A1			
CEND1516_RHC19_STN_66_B1			

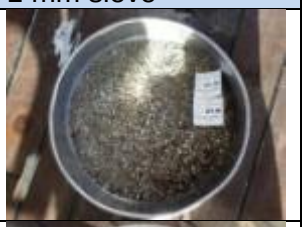
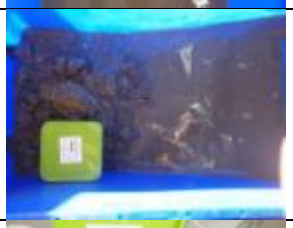
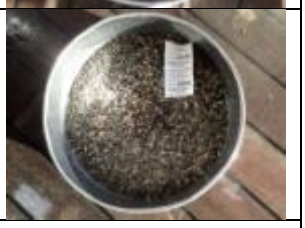
Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC19_STN_67_A1			
CEND1516_RHC48_STN_80_A1			
CEND1516_RHC48_STN_81_A1			
CEND1516_RHC48_STN_81_B1			
CEND1516_RHC40_STN_82_A1			
CEND1516_RHC40_STN_82_B1			
CEND1516_RHC41_STN_84_A1			
CEND1516_RHC41_STN_85_A1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC41_STN_85_B1			
CEND1516_RHC42_STN_86_A1			
CEND1516_RHC42_STN_86_B1			
CEND1516_RHC42_STN_87_A1			
CEND1516_RHC46_STN_88_A1			
CEND1516_RHC46_STN_89_A1			
CEND1516_RHC46_STN_89_B1			
CEND1516_RHC50_STN_90_B1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC50_STN_91_A1			
CEND1516_RHC44_STN_92_A1			
CEND1516_RHC44_STN_93_A1			
CEND1516_RHC44_STN_93_B1			
CEND1516_RHC36_STN_94_A1			
CEND1516_RHC36_STN_94_B1			
CEND1516_RHC36_STN_95_A1			
CEND1516_RHC35_STN_98_A1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC35_STN_99_A1			
CEND1516_RHC35_STN_99_B1			
CEND1516_RHC43_STN_100_A1			
CEND1516_RHC43_STN_100_B1			
CEND1516_RHC43_STN_101_A1			
CEND1516_RHC49_STN_102_A2			
CEND1516_RHC49_STN_103_A1			
CEND1516_RHC49_STN_103_B1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC47_STN_104_A1			
CEND1516_RHC47_STN_104_B1			
CEND1516_RHC47_STN_105_A2			
CEND1516_RHC37_STN_106_A1			
CEND1516_RHC37_STN_107_A1			
CEND1516_RHC37_STN_107_B1			
CEND1516_RHC38_STN_108_A1			
CEND1516_RHC38_STN_108_B1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC38_STN_109_A1			
CEND1516_RHC39_STN_110_A1			
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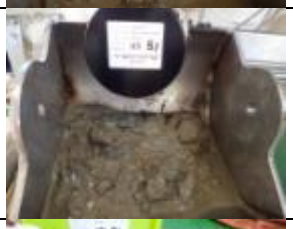
CEND1516_RHC39_STN_111_B1			
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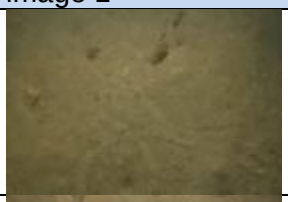
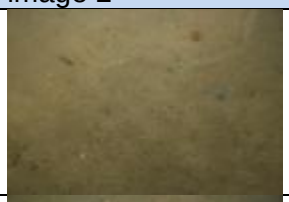
CEND1516_RHC45_STN_112_B1			
CEND1516_RHC45_STN_113_A1			
CEND1516_RHC31_STN_114_A1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC31_STN_115_A1			
CEND1516_RHC31_STN_115_B1			
CEND1516_RHC32_STN_116_A1			
CEND1516_RHC32_STN_116			
CEND1516_RHC32_STN_117_A1			
CEND1516_RHC34_STN_118_A1			
CEND1516_RHC34_STN_119_A1			
CEND1516_RHC34_STN_119_B1			

Station	PSA	5 mm sieve	1 mm sieve
CEND1516_RHC33_STN_120_A1			
CEND1516_RHC33_STN_120_B1			
CEND1516_RHC33_STN_121_A1			

Station	Cobble 1	Cobble 2	Cobble 3
CEND1516_RHC04_STN_11_A1			
CEND1516_RHC15_STN_44_A3			
CEND1516_RHC26_STN_47_A3			
CEND1516_RHC39_STN_110_A1			

Station	Representative image 1	Representative image 2	Representative image 3
CEND1516_RHC54_STN_68_A1			
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CEND1516_RHC56_STN_71_A1			
CEND1516_RHC53_STN_72_A1			
CEND1516_RHC55_STN_73_A1