

Cruise report



Environmental Survey of Coastal and Shelf Waters Killybegs–Cork: Benthos monitoring 2017 (CV17-001)

Vessel Name: RV *Celtic Voyager* **Call Sign:** EIQN

Start Date: 11/02/2016

End Date: 17/01/2016

Port of Dept: Killybegs

Port of Return: Cork



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1. Introduction & Rationale

Since 2011 the Winter Environmental Survey (WES) has operated with an allocated ship-time of up to 13 days on the Celtic Voyager and funded through NDP. These surveys alternate between south-about and a north-about each year with a southerly survey proposed for 2017. The survey covers coastal waters and bays but also shelf waters through offshore transects and as such are complementary to EPAs estuarine water quality monitoring activities.

While all previous surveys have had a strong multi-disciplinary component to them incorporating both Chemical and Biological elements, the survey during 2017 was reduced relative to previous years. During 2017, the Chemistry portion of the survey was omitted as a consequence of resource (personnel) limitations. The Chemistry Section will focus efforts on surveys (GO-SHIP AO2 line, and Rockall Hydrographic Survey) to be carried out on the Celtic Explorer during Q1/Q2 of 2017. However, during 2017 the survey focused on benthos ecological quality element and some hydromorphological elements. It is expected that the survey will revert to a full multidisciplinary programme in 2018.

2. Objectives

Conduct Water Framework Directive monitoring (Dir 2000/60/EC) and provide supporting information for the implementation of the Natura Directives (Habitats Directive 92/43/EEC).

- Collect samples to provide data to contribute to classification of WFD (client EPA) ecological status of selected water bodies for benthic macro-invertebrate ecological quality elements in a select number of waterbodies along North Western, Western and Southwestern coastal waters.
- Using benthic invertebrates and associated sediment information (Particle Size Analysis) the survey will be able provide additional habitat distribution data (ground truth data) for a variety of Natura sites along the Western and Southwestern Seaboard.

3. Personnel

Role: Chief Scientist

Name: Francis O'Beirn (FOB) – Benthos Ecology

Organisation Name: Marine Environment & Food Safety Services, Marine Institute

Address: Marine Institute, Rinville, Oranmore, Galway, Ireland

Email: francis.obeirn@marine.ie

Role: Scientist

Name: Louise Healy (LH) -Benthos

Organisation Name: Marine Environment & Food Safety Services, Marine Institute

Address: Marine Institute, Rinville, Oranmore, Galway, Ireland

Email: louise.healy@Marine.ie

Crew: Master and 6 crew. **Master** Phillip Baugh
Adam Rahily, Paul Murphy, Jason White, Thomas Byrne, Thomas Greally, Ollie Murphy
Technical support: none

4. Methods & Protocol

4.1. Equipment Listing

4.1.5. On board Seawater Pump

Sampling Protocols: The seawater pump was used to collect surface water at all designated sites within waterbodies.

4.1.6. Data were also generated by MDM 400.

4.1.7. Reineck Box Corer

Make: Reineck

Sampling Protocols: not used

4.1.8 Grab sampler

Make: Day Grab

Model: P&O design

Sampling Protocols: Sediments were sampled for benthic infauna using Day grab. Sediment samples were removed from the grab and a small subsample retained (and frozen) for PSA and organic carbon analysis (LOI). The remaining sediment was sieved through a 1mm mesh sieve and fixed in formalin (5%). Two grabs were on-board (1 benthos Ecology and 1 vessel).

4.1.9 Shipek sediment grab sampler

Make: Shipek

Model:

Sampling Protocols: Not used

4.1.10 SCS system: The system was used to log all sampling events with automated date, time and GPS stamping.

4.2. On-board processing of benthic samples

Sediment samples: At all benthic stations where suitable sediments could be sampled, a subsample of sediments (100-200g) was taken for Particle Size Analysis (PSA) and Loss on Ignition (LOI). The samples were labelled and stored in plastic zip-loc bags and frozen.

Macroinvertebrate samples: At each station where sufficient sediment (>2.5L) was retained for faunal analysis. These samples comprised single Day grab samples. Upon retrieval all sediment were washed on a 1mm mesh sieve. All faunal and residue (e.g. sediment and shell matter) were retained and stored in a plastic container and fixed with V:V 4% neutral buffered formalin.

4.3 Equipment Issues

4.3.1 The SCS system was used to visually confirm positional information (lat, long and water depth) for sampling events at each benthic sampling stations. However, the system was timing out and not displaying in wet lab. The resolution was to access the control panel and override any timeout. This solution was discovered after day 3.

4.3.2 The MI Day grab was not functioning correctly as the jaws of the grab were not aligned and the samples were being lost upon retrieval. It was not possible to repair on-board so the grab was replaced with the vessel grab, which functioned well throughout.

5. Narrative

The survey was scheduled from 11th Feb (Killybegs, Co. Donegal) to 19th Feb (Cork Harbour). Overall the weather conditions for the duration of the survey were good, with one of two situations with heavy swell. The sampling plan arranged with the master each day broadly followed the following arrangement whereby waterbodies were grouped to allow sampling during daylight hours and travel to the next series of waterbodies overnight. This worked well and allowed sufficient rest for the scientific complement and crew.

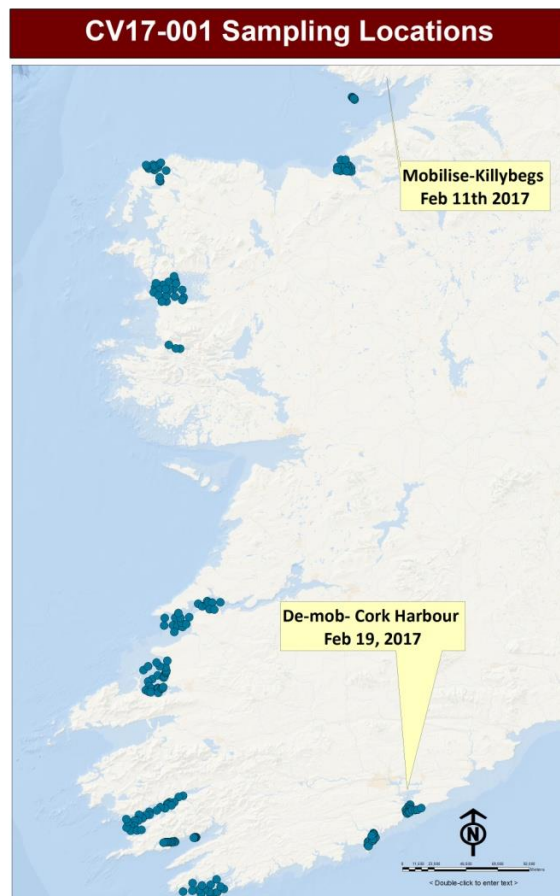


Figure 1: Proposed Sampling Locations for CV17-001.

11th Feb

The scientific complement joined the vessel on Saturday 10th of February, which allowed sufficient time for set-up on board.

12th Feb

0900hrs: Departed Killybegs. Sampling commenced at the proposed Killybegs spoil site at 1015hrs. Seven stations were sampled with three replicates at each site. At the first site (BG05), the Day Grab experienced issues with retaining a sample (highlighted above). Multiple unsuccessful attempts were made and the grab was eventually replaced with the vessel grab. This functioned well for the duration of the survey. In total, 21 samples were retained from this location with no other issues. Samples were good quantity and of fine sands and muds. Sampling finished at 1200hrs. Transit commenced to Sligo Bay.

1340hrs: Arrived at Sligo Bay when sampling commenced. 15 stations were successfully sampled in Sligo Bay. All stations consisted of fine sands which ranged from $\frac{1}{2}$ - $\frac{3}{4}$ full grabs. Sampling took 3hours 15 minutes. Transit to Broadhaven Bay at 1630hrs.

2100hrs: Arrived in Broadhaven Bay. A number of proposed stations were removed from the inner portion of this waterbody on foot of navigational concerns. 12 stations were sampled in Broadhaven. At a number of sites in the outer portion of the waterbody, the vessel was subjected to very heavy swell. It caused considerable swinging of the grab and on a number of occasions (n=5) the grab triggered on descent. Sampling finished at 2300hrs. Sediments comprised mostly fine to medium sands.

Transit to Killary harbour through the night.

Running total samples = 48 samples

13th Feb.

0745hr: Steam into Killary Harbour

0915hr: Commence sampling 3 stations (5 replicates at each station) n=15 total

1100hr: Complete sampling and steam to Clew Bay.

No issues with equipment – slight delays clearing samples (replicates) between stations.

1230hr: Arrive Clew Bay and commence sampling

Sample 20 stations

1745hr: Complete Sampling

No issues - some heavy seas at westernmost sampling locations near Clare Island.

1800hr: steam to Shannon Estuary

Running total = 83 samples

14th Feb

0815hrs: Commence sampling in outer Shannon Estuary Waterbody inside Scatterry Island.

Sample 15 stations

1200hrs: break for lunch

1240hrs: Resume sampling - sample 6 stations.

1430hrs: finish sampling and steam to Tralee Bay sites.

Note: The number of sites in Tralee Bay sites were reduced to 11 from 25 on advice of the Master due to proximity to shore and putative hard ground.

1545hrs: Commence sampling in Tralee Bay

1840hrs: Finish sampling Tralee Bay

Poor return of samples. Only 2 of the 11 sites yielded samples of sufficient quality. Rest of sites were too coarse or rock.

1850hrs: Steam to Kenmare River.

Running Total = 105 (9 missed)

15th Feb

0800hrs: Commence sampling in Kenmare River

Sample 17 stations

1200hrs: Lunch

1240hrs: Resume Sampling

Complete 9 stations in outer bay. Heavy seas caused some of the outer Kenmare stations to require multiple attempts. Grab was triggered on descent.

1440hrs: transit to Casteltownbere, Bantry Bay

1820hrs: commence sampling in Berehaven WB and Shot Head

Sampled 10 sites, and 7 sites (3 reps) in two waterbodies

2140hrs: Completed sampling

2145hrs: Transit to Roaringwater Bay.

Running Total = 170 (11 missed)

Note: In communication with the Master, a number of sites in outer Kinsale Harbour were reviewed. Upon review, a number of sites were deemed not conducive to successful sampling as they appeared to be on hard ground. Two sites were moved and 5 removed.

Furthermore, given that formalin stocks were reduced and sampling outer Cork Harbour would have resulted in a full extra days sampling, it was decided by the Chief Scientist to remove this waterbody so that the survey would be completed with the Kinsale sampling on 16th Feb. Cork Harbour would be sampled during 2018 WES.

16th Feb

0830hrs: sampling commenced in Roaringwater Bay

1230hrs; sampling completed 15 sites sampled. Some outer sites had triggering of grab upon descent due to heavy swell. Will need to note coarse sediment sites for future surveys (in particular northeast of cape clear). Furthermore, Site BG160 was deleted from wheel house display – will need to check with vessel operations to see what was transferred to P&O.

1230hrs: Transit to Kinsale harbour

1800hrs: commenced sampling in Kinsale Harbour

2015hrs: Completed sampling in Kinsale Harbour and transit to Cork.

3 Sites not aligned with expected sites - check positioning with wheel house!

Running Total = 197 (14 missed)

2230hrs –arrived Cork and docked

17th Feb

Tidy and pack up gear for transport from Cork

Sign off at 1100hrs.

Table 1. Benthic sampling summary table.

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
1	12/02/2017	10:16	MIBE17-005-1	558795.1	868531.4	67	5	Yes	Fine sand	Yes	
2	12/02/2017	10:23	MIBE17-005-2	558874.3	868506.6	66	5	Yes	Fine sand	Yes	
3	12/02/2017	10:31	MIBE17-005-3	558888.5	868539.1	68	7	Yes	Fine sand	Yes	
4	12/02/2017	10:38	MIBE17-006-1	559101.4	868393.4	70	7	Yes	Fine sand	Yes	
5	12/02/2017	10:41	MIBE17-006-2	558974.9	868395.5	70	7	Yes	Fine sand	Yes	
6	12/02/2017	10:45	MIBE17-006-3	558915.8	868333.7	70	7	Yes	Fine sand	Yes	
7	12/02/2017	10:52	MIBE17-004-1	559374.7	868162.0	70	7	Yes	Fine sand	Yes	
8	12/02/2017	10:57	MIBE17-004-2	559290.5	868135.8	70	7	Yes	Fine sand	Yes	
9	12/02/2017	11:00	MIBE17-004-3	559194.3	868148.6	70	7	Yes	Fine sand	Yes	
10	12/02/2017	11:05	MIBE17-003-1	559530.1	867994.0	70	7	Yes	Fine sand	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
11	12/02/2017	11:11	MIBE17-003-2	559467.0	867965.1	70	8	Yes	Fine sand	Yes	
12	12/02/2017	11:14	MIBE17-003-3	559375.5	867981.5	70	7	Yes	Fine sand	Yes	
13	12/02/2017	11:20	MIBE17-001-1	559667.4	867887.0	70	5	Yes	Fine sand	Yes	
14	12/02/2017	11:25	MIBE17-001-2	559596.6	867897.4	70	5	Yes	Fine sand	Yes	
15	12/02/2017	11:28	MIBE17-001-3	559537.5	867886.3	70	7	Yes	Fine sand	Yes	
16	12/02/2017	11:34	MIBE17-007-1	559837.7	867726.7	70	7	Yes	Fine sand	Yes	
17	12/02/2017	11:39	MIBE17-007-2	559779.9	867708.2	70	5	Yes	Fine sand	Yes	
18	12/02/2017	11:42	MIBE17-007-3	559698.3	867712.6	70	6	Yes	Fine sand	Yes	
19	12/02/2017	11:49	MIBE17-002-1	560065.8	867410.5	70	7	Yes	Fine sand	Yes	
20	12/02/2017	11:53	MIBE17-002-2	560030.9	867389.3	70	6	Yes	Fine sand	Yes	
21	12/02/2017	11:57	MIBE17-002-3	559945.9	867405.2	70	7	Yes	Fine sand	Yes	
22	12/02/2017	13:39	MIBE17-022	553802.8	841996.7	26	8	Yes	Fine sand	Yes	
23	12/02/2017	13:53	MIBE17-008	555745.2	842020.5	23	7	Yes	Fine sand	Yes	
24	12/02/2017	14:07	MIBE17-016	556038.1	840071.7	16	7	Yes	Fine sand	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
25	12/02/2017	14:19	MIBE17-21	557266.9	839489.3	15	5	Yes	Fine sand	Yes	
26	12/02/2017	14:30	MIBE17-020	558106.5	838532.2	12	7	Yes	Fine sand	Yes	
27	12/02/2017	14:41	MIBE17-019	558191.3	837085.7	10	7	Yes	Fine sand	Yes	
28	12/02/2017	14:50	MIBE17-018	557138.8	837210.0	13	7	Yes	Fine sand	Yes	
29	12/02/2017	14:59	MIBE17-009	556306.2	837148.0	16	7	Yes	Fine sand	Yes	
30	12/02/2017	15:13	MIBE17-017	556657.3	838833.2	14	6	Yes	Fine sand	Yes	
31	12/02/2017	15:23	MIBE17-015	555373.6	839066.3	18	6	Yes	Fine sand	Yes	
32	12/02/2017	15:34	MIBE17-014	555298.0	837572.7	20	7	Yes	Fine sand	Yes	
33	12/02/2017	15:48	MIBE17-013	553619.2	837402.0	22	6	Yes	Fine sand	Yes	
34	12/02/2017	16:00	MIBE17-012	554042.2	838799.0	22	7	Yes	Fine sand	Yes	
35	12/02/2017	16:11	MIBE17-011	552221.7	838874.3	23	7	Yes	Fine sand	Yes	
36	12/02/2017	16:21	MIBE17-010	552280.5	837636.7	21	6	Yes	Fine sand	Yes	
37	12/02/2017	21:02	MIBE17-023	477603.2	842269.4	48	6	Yes	Fine sand	Yes	
38	12/02/2017	21:14	MIBE17-024	476902.4	841686.9	48	7	Yes	Fine sand	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
39	12/02/2017	21:26	MIBE17-033	476337.7	840227.2	37	7	Yes	Fine sand	Yes	
40	12/02/2017	21:41	MIBE17-035	477286.9	837898.1	27	7	Yes	Fine sand	Yes	
41	12/02/2017	21:55	MIBE17-032	474793.8	839179.1	37	7	Yes	Fine sand	Yes	
42	12/02/2017	22:08	MIBE17-025	474750.9	840801.6	45	7	Yes	Fine sand	Yes	
43	12/02/2017	22:15	MIBE17-026	474252.1	841432.2	47	6	Yes	Fine sand	Yes	
44	12/02/2017	22:31	MIBE17-030	473202.3	840130.2	37	6	Yes	Fine sand	Yes	
45	12/02/2017	22:41	MIBE17-030	473607.0	839720.3	40	6	Yes	Fine sand	Yes	
46	12/02/2017	22:52	MIBE17-029	472242.2	839804.7	40	5	Yes	Fine sand	Yes	
47	12/02/2017	23:09	MIBE17-027	471287.2	841352.8	43	9	Yes	Coarse sand	Yes	
48	12/02/2017	23:04	MIBE17-028	471519.5	840938.7	42	8	Yes	Coarse sand	Yes	
49	13/02/2017	08:44	MIBE17-058	478850.5	764516.6	14	14	Yes	Mud	Yes	5 replicates
50	13/02/2017	09:15	MIBE17-059	481659.2	762778.3	12	14	Yes	Mud	Yes	5 replicates
51	13/02/2017	09:50	MIBE17-060	483129.2	762702.0	11	14	Yes	Mud	Yes	5 replicates
52	13/02/2017	12:22	MIBE17-041	476309.5	782997.1	11	6	Yes	Fine sand	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
53	13/02/2017	12:38	MIBE17-049	478454.4	783062.2	10	9	Yes	Fine sand	Yes	
54	13/02/2017	13:12	MIBE17-040	485326.0	783477.4	18	7	Yes	Fine sand	Yes	
55	13/02/2017	13:23	MIBE17-056	485723.5	784577.8	20	6	Yes	Fine sand	Yes	
56	13/02/2017	13:43	MIBE17-050	482050.8	785087.7	25	7	Yes	Fine sand	Yes	
57	13/02/2017	14:03	MIBE17-048	478443.4	785668.9	28	7	Yes	Fine sand	Yes	
58	13/02/2017	14:21	MIBE17-042	475053.5	785707.1	23	7	Yes	Fine sand	Yes	
59	13/02/2017	14:36	MIBE17-043	472987.5	787123.1	28	7	Yes	Fine sand	Yes	
60	13/02/2017	14:52	MIBE17-044	475252.5	788247.6	34	6	Yes	Fine sand	Yes	
61	13/02/2017	15:15	MIBE17-038	478145.2	788704.4	28	7	Yes	Fine sand	Yes	
62	13/02/2017	15:28	MIBE17-047	479809.5	788169.1	30	7	Yes	Fine sand	Yes	
63	13/02/2017	15:40	MIBE17-051	481676.4	788409.5	29	7	Yes	Coarse sand	Yes	
64	13/02/2017	15:58	MIBE17-055	485226.0	787818.9	24	7	Yes	Fine sand	Yes	
65	13/02/2017	16:18	MIBE17-039	482543.7	790691.8	29	8	Yes	Sandy mud	Yes	
66	13/02/2017	16:31	MIBE17-054	482382.3	792105.5	24	8	Yes	Sandy mud	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
67	13/02/2017	16:41	MIBE17-053	481895.9	794027.9	12	7	Yes	Fine sand	Yes	
68	13/02/2017	17:01	MIBE17-052	479572.3	791450.3	23	7	Yes	Fine sand	Yes	
69	13/02/2017	17:19	MIBE17-046	476860.9	789988.7	26	7	Yes	Coarse sand	Yes	
70	13/02/2017	17:35	MIBE17-045	474082.7	791167.7	25	7	Yes	Coarse sand	Yes	2 sand eels
71	13/02/2017	17:49	MIBE17-057	473732.0	789143.6	35	9	Yes	Coarse sand	Yes	
72	14/02/2017	08:15	MIBE17-062	498717.3	651835.9	14		No		No	3 grabs. shell
73	14/02/2017	08:36	MIBE17-061	495992.5	648688.0	14	5	Yes	Coarse sand	Yes	Shell and sand
74	14/02/2017	08:48	MIBE17-063	493849.0	648911.6	23	5	Yes	Sandy mud	Yes	
75	14/02/2017	09:05	MIBE17-064	495004.8	651848.1	12	7	Yes	Fine sand	Yes	
76	14/02/2017	09:13	MIBE17-065	493346.1	651851.3	14	5	Yes	Coarse sand	Yes	2 attempts
77	14/02/2017	09:22	MIBE17-066	492908.2	652609.1	21	5	Yes	Sandy mud	Yes	
78	14/02/2017	09:33	MIBE17-067	492540.9	650930.0	25	6	Yes	Mud	Yes	Mud clasts
79	14/02/2017	09:46	MIBE17-068	490595.4	650226.4	37	5	Yes	Gravelly mud	Yes	Shell sand
80	14/02/2017	09:58	MIBE17-069	488917.9	651375.0	15		No		No	cobble gravel

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
81	14/02/2017	10:24	MIBE17-070	484894.1	645595.8	19	10	Yes	Fine sand	Yes	
82	14/02/2017	10:41	MIBE17-073	480972.7	645339.3	26	14	Yes	Coarse sand	Yes	1 sand eel
83	14/02/2017	10:53	MIBE17-072	480159.1	647579.4	17	7	Yes	Fine sand	Yes	
84	14/02/2017	11:21	MIBE17-078	478654.1	645467.8	20	5	Yes	Fine sand	Yes	
85	14/02/2017	11:41	MIBE17-081	474094.9	645563.9	38	6	Yes	Fine sand	Yes	
86	14/02/2017	11:59	MIBE17-080	473631.8	642140.9	42	5	Yes	Fine sand	Yes	
87	14/02/2017	12:52	MIBE17-079	477423.5	642228.6	25	5	Yes	Fine sand	Yes	1 sand eel
88	14/02/2017	13:07	MIBE17-077	479698.6	641771.7	20	5	Yes	Fine sand	Yes	
89	14/02/2017	13:23	MIBE17-075	481872.7	641373.4	20	5	Yes	Fine sand	Yes	2 attempts
90	14/02/2017	13:35	MIBE17-071	483478.2	642617.4	18	5	Yes	Fine sand	Yes	
91	14/02/2017	13:47	MIBE17-074	481446.0	643418.6	14	6	Yes	Fine sand	Yes	
92	14/02/2017	14:16	MIBE17-076	477531.9	639694.6	25		No		No	2 attempts-rock
93	14/02/2017	15:43	MIBE17-084	469962.9	625952.0	21		No		No	2 attempts-rock
94	14/02/2017	15:59	MIBE17-086	472709.5	626591.9	16		No		No	2 attempts-rock

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
95	14/02/2017	16:12	MIBE17-087	472264.7	625285.6	8		No		No	2 attempts-rock
96	14/02/2017	16:26	MIBE17-085	471342.2	624101.9	11		No		No	2 attempts-rock
97	14/02/2017	16:47	MIBE17-089	472470.4	621759.4	13	7	Yes	Fine sand	Yes	
98	14/02/2017	17:01	MIBE17-091	471850.3	619848.2	16	7	Yes	Fine sand	Yes	
99	14/02/2017	17:15	MIBE17-093	470123.0	620289.8	18		No		No	2 attempts-rock
100	14/02/2017	17:30	MIBE17-106	467494.7	619163.9	13		No		No	Bedrock.
101	14/02/2017	17:44	MIBE17-105	465959.7	617494.4	13		No		No	coarse no sample
102	14/02/2017	17:55	MIBE17-104	466175.4	615620.0	14		No		No	Rock
103	14/02/2017	18:32	MIBE17-082	466204.6	624160.3	20		No		No	Bedrock
104	15/02/2017	08:18	MIBE17-133	480205.3	566322.7	22	14	Yes	Mud	Yes	Leaf litter
105	15/02/2017	08:30	MIBE17-132	478218.6	565831.6	25	14	Yes	Mud	Yes	Leaf litter
106	15/02/2017	08:45	MIBE17-131	476196.2	563433.8	34	14	Yes	Mud	Yes	
107	15/02/2017	08:55	MIBE17-127	474787.1	562072.5	33	14	Yes	Sandy mud	Yes	
108	15/02/2017	09:04	MIBE17-130	473995.5	563555.6	33	14	Yes	Mud	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
109	15/02/2017	09:12	MIBE17-129	473070.7	562916.0	36	14	Yes	Mud	Yes	
110	15/02/2017	09:19	MIBE17-128	473497.8	562393.1	37	14	Yes	Mud	Yes	
111	15/02/2017	09:36	MIBE17-126	472079.9	560851.3	40	14	Yes	Mud	Yes	
112	15/02/2017	09:49	MIBE17-125	469892.9	561451.5	41	14	Yes	Mud	Yes	
113	15/02/2017	10:02	MIBE17-124	468249.1	560044.1	46	14	Yes	Mud	Yes	
114	15/02/2017	10:21	MIBE17-123	464990.3	559510.0	47	14	Yes	Mud	Yes	
115	15/02/2017	10:31	MIBE17-122	464947.7	558167.9	48	14	Yes	Mud	Yes	
116	15/02/2017	10:42	MIBE17-121	463241.6	558046.2	50	14	Yes	Mud	Yes	
117	15/02/2017	10:59	MIBE17-119	460322.5	558270.1	40	7	Yes	Sandy mud	Yes	
118	15/02/2017	11:11	MIBE17-120	461705.1	556705.2	53	14	Yes	Mud	Yes	
119	15/02/2017	11:27	MIBE17-116	459802.8	555773.7	54		No		No	Rock
120	15/02/2017	11:46	MIBE17-115	458146.7	555819.1	60	14	Yes	Mud	Yes	
121	15/02/2017	12:39	MIBE17-107	454408.6	556458.9	47	7	Yes	Fine sand	Yes	
122	15/02/2017	12:49	MIBE17-109	455142.3	555228.6	63	14	Yes	Mud	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
123	15/02/2017	13:03	MIBE17-117	457045.9	554356.6	62	14	Yes	Mud	Yes	
124	15/02/2017	13:14	MIBE17-114	457808.3	553329.2	61	12	Yes	Mud	Yes	
125	15/02/2017	13:30	MIBE17-113	456406.6	553079.6	64	14	Yes	Mud	Yes	
126	15/02/2017	13:45	MIBE17-111	454468.0	552694.5	68	14	Yes	Mud	Yes	
127	15/02/2017	14:01	MIBE17-112	456214.3	551180.0	65	14	Yes	Mud	Yes	
128	15/02/2017	14:19	MIBE17-110	459202.0	551259.4	47	7	Yes	Fine sand	Yes	
129	15/02/2017	14:30	MIBE17-108	460556.8	551774.8	65	14	Yes	Mud	Yes	
130	15/02/2017	18:06	MIBE17-141	471010.5	545455.2	16	14	Yes	Mud	Yes	
131	15/02/2017	18:11	MIBE17-142	471717.3	545715.2	15	14	Yes	Mud	Yes	
132	15/02/2017	18:16	MIBE17-143	472391.6	545707.2	16	14	Yes	Mud	Yes	
133	15/02/2017	18:24	MIBE17-144	473077.5	545667.9	18	14	Yes	Mud	Yes	
134	15/02/2017	18:30	MIBE17-145	473850.8	545664.6	18	14	Yes	Mud	Yes	
135	15/02/2017	18:38	MIBE17-146	474477.0	545538.6	19	14	Yes	Mud	Yes	
136	15/02/2017	18:44	MIBE17-147	474855.6	545939.3	18	14	Yes	Mud	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
137	15/02/2017	18:54	MIBE17-148	475579.4	545657.9	20	14	Yes	Mud	Yes	
138	15/02/2017	19:01	MIBE17-149	476133.2	545699.3	19	14	Yes	Mud	Yes	
139	15/02/2017	19:09	MIBE17-150	475911.5	546080.5	21	14	Yes	Mud	Yes	
140	15/02/2017	19:48	MIBE17-134	484664.2	547435.8	43	14	Yes	Mud	Yes	3 replicates
141	15/02/2017	20:10	MIBE17-135	484739.2	547353.9	43	14	Yes	Mud	Yes	3 replicates
142	15/02/2017	20:26	MIBE17-136	484837.6	547545.8	43	14	Yes	Mud	Yes	3 replicates
143	15/02/2017	20:41	MIBE17-137	484962.7	547571.3	48	14	Yes	Mud	Yes	3 replicates
144	15/02/2017	20:54	MIBE17-138	485109.5	547287.7	43	14	Yes	Mud	Yes	3 replicates
145	15/02/2017	21:06	MIBE17-139	485533.3	547419.9	42	14	Yes	Mud	Yes	3 replicates
146	15/02/2017	21:19	MIBE17-140	485730.7	547643.0	41	14	Yes	Mud	Yes	3 reps - 3/4 full
147	16/02/2017	08:23	MIBE17-162	497743.8	524064.5	21	14	Yes	Coarse sand	Yes	
148	16/02/2017	08:34	MIBE17-161	496320.4	525054.5	34	5	Yes	Fine sand	Yes	
149	16/02/2017	08:49	MIBE17-163	494764.8	522592.9	40	14	Yes	Fine sand	Yes	
150	16/02/2017	08:55	MIBE17-164	494080.7	522343.6	44	5	Yes	Fine sand	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
151	16/02/2017	09:22	MIBE17-159	494447.6	528337.5	26	14	Yes	Coarse sand	Yes	2 buckets
152	16/02/2017	09:38	MIBE17-158	491875.3	526039.8	42	5	Yes	Fine sand	Yes	
153	16/02/2017	09:56	MIBE17-157	488996.0	523768.6	50	5	Yes	Fine sand	Yes	
154	16/02/2017	10:13	MIBE17-154	487884.6	525743.8	46	11	Yes	Fine sand	Yes	
155	16/02/2017	10:28	MIBE17-155	486168.8	523812.1	50	11	Yes	Fine sand	Yes	
156	16/02/2017	10:48	MIBE17-153	483684.5	526927.0	32	11	Yes	Fine sand	Yes	
157	16/02/2017	11:14	MIBE17-151	479100.7	523147.9	52	14	Yes	Coarse sand	Yes	2 attempts
158	16/02/2017	11:37	MIBE17-152	483445.5	523503.2	52	11	Yes	Fine sand	Yes	
159	16/02/2017	11:58	MIBE17-156	487318.3	521902.1	47	7	Yes	Fine sand	Yes	3 attempts
160	16/02/2017	12:23	MIBE17-160	491029.2	522777.6	49	11	Yes	Fine sand	Yes	1 sand eel
161	16/02/2017	12:36	MIBE17-165	491494.9	521454.8	46	7	Yes	Fine sand	Yes	
162	16/02/2017	17:52	MIBE17-172	563379.2	542381.6	20	7	Yes	Coarse sand	Yes	
163	16/02/2017	17:58	MIBE17-180	562909.4	542978.5	17	7	Yes	Fine sand	Yes	
164	16/02/2017	18:09	MIBE17-178	563177.1	544239.0	17	8	Yes	Fine sand	Yes	

	Date	Time	MI Sample Code	E	N	Site Depth (m)	Sample Depth (cm)	PSA Sample	Sediment type	Fauna sample	Notes
165	16/02/2017	18:16	MIBE17-183	563231.7	544526.5	15	7	Yes	Fine sand	Yes	
166	16/02/2017	18:27	MIBE17-179	564134.0	544266.1	24		No		No	Hard ground 3 grab
167	16/02/2017	18:40	MIBE17-185	564892.4	544987.6	27		No		No	Hard ground 3 grab
168	16/02/2017	18:46	MIBE17-176	565480.7	544836.3	30	14	Yes	Mud	Yes	
169	16/02/2017	18:54	MIBE17-173	565861.6	545413.1	29	7	Yes	Mud	Yes	
170	16/02/2017	19:05	MIBE17-186	564800.3	546667.8	18	10	Yes	Mud	Yes	
171	16/02/2017	19:11	MIBE17-166	564864.4	547171.8	15	7	Yes	Fine sand	Yes	
172	16/02/2017	19:17	MIBE17-167	565448.3	547697.6	13	7	Yes	Fine sand	Yes	
173	16/02/2017	19:25	MIBE17-174	565771.3	548064.6	10	14	Yes	Mud	Yes	
174	16/02/2017	19:22	MIBE17-168	565689.3	547884.1	11	14	Yes	Mud	Yes	
175	16/02/2017	19:40	MIBE17-184	566181.1	545878.2	25	10	Yes	Mud	Yes	
176	16/02/2017	19:48	MIBE17-175	566543.8	546275.2	23		No		No	Hard ground 3 grab

6. Conclusions

Effective completion of the cruise objectives.

The survey was considered very successful as a result of very favorable weather conditions, excellent technical support and efficient timing. In total, 211 grabs were attempted with 197 successfully retained. Benthic sampling was completed for all the priority areas targeted with the exception of Cork Harbour which was removed from sampling schedule for reasons outlined above. In all, it was a very successful survey. This was in no small measure to the excellent support provided to the reduced scientific complement from the Master and his crew.

The scientific team would especially to acknowledge and thank the master (Philip Baugh), and all of the crew for their excellent support throughout the survey as well as shore based staff of Vessel operations/P&O team for their excellent support and help over the course of this survey.