CENTRE FOR ENVIRONMENT, FISHERIES & AQUACULTURE SCIENCE

LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

2015 RESEARCH VESSEL PROGRAMME

PROGRAMME: RV CEFAS ENDEAVOUR: CRUISE 12/15

PROJECT: MB003N

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DURATION: 04 – 11 June 2015

LOCATION: North Sea (English NE)

AIMS:

1. To conduct a standard underwater TV survey of *Nephrops* burrow densities on the Farn Deeps grounds, 55° 35' - 54° 45' N and 1° 30' - 0 ° 40' W, and to evaluate *Nephrops* abundance (110 stations).
2. To conduct seabed multibeam survey (at each TV survey station).
3. To collect surface water samples. This data will be used for the Shelf Sea Biogeochemistry Research Programme, WP1 Candyfloss (NERC/Defra funded)[1] and will contribute to estimating the size of the shelf carbon pump over the whole NW European shelf, and its relationship to the global carbon cycle.

[1] Shelf Sea Biogeochemistry Research Programme – The goals of this project are (1) to quantify the role of the NW European shelf seas in the global nutrient and carbon cycles, and (2) to understand the critical processes by which this role is sustained. The project will rely on a year-long whole NW European shelf sampling programme using vessels of opportunity (Objective 1) along with process studies on 4 cruises in the Celtic Sea (Objective 2) The whole shelf sampling programme will allow a synoptic assessment of the distribution and cycling of inorganic and organic carbon and nutrients, CO2 and N2O. Daily sampling from Endeavour is part of Objective (1) and will contribute to estimating the size of the shelf carbon pump over the whole NW European shelf, and its relationship to the global carbon cycle.
Point of contact: Naomi Greenwood (naomi.greenwood@cefas.co.uk)

4. To collect and filter on board water samples for determination of chlorophyll (phytoplankton pigments) concentration and to collect samples for SPM analysis, that will be used for calibrating ocean colour space-borne data under the EU FP7 project HIGHROC[2].

PLAN:

CEFAS ENDEAVOUR will sail on 4th June from Lowestoft and will return to the same port on 11th June, 2015. This survey involves 24 hour procedures and the scientific staff will be working 4/8 hours shifts (2 people per shift).

Under objective 1&2:

Video data will be collected from cameras mounted on a towed sledge. On the Farn Deeps grounds, 110 stations will be visited with the aim of recording a clear 10 minute continuous video transect of the sea bed at each station (Figure 2, Table 1).

A multibeam run will be conducted at each TV survey station.

All video will be analysed and the counts confirmed at sea. Data will be entered and QC onboard.

Under objective 3:

Water samples will be collected daily (3 samples per day) form the surface underway supply whenever it fits in with the work (this will approximately take about 40 minutes). The samples can be taking whilst steaming or whilst on station from the underway surface supply. The Ferrybox pump will need to be running (P&O engineers should switch this on routinely when the boat is underway out of port) as samples will be collected from the Ferrybox sample outlet.

Samples after being collected will be preserved (using mercuric chloride) for analysis of total alkalinity/dissolved inorganic carbon, inorganic nutrients and dissolved organic matter.

Under objective 4:

Water samples will be collected within 500 m from Smartbuoy sites (Dowsing SmartBuoy: 53.53 N 1.06 E), from the surface underway supply. The samples can be taken whilst steaming. The Ferrybox pump will need to be running (P&O engineers should switch this on routinely when the boat is underway out of port) as samples will be collected from the continuous water supply in the garage (see relevant SOP).
Samples for SPM analysis, after being collected, will be stored in a fridge, while samples for chlorophyll analysis will be filtered and stored in the -80C freezer.

[2] The HIGHROC (HIGH spatial and temporal Resolution Ocean Colour) project will carry out the research and development necessary for the next generation coastal water products and services from ocean colour space-borne data by giving an order of magnitude improvement in both temporal and spatial resolution. These improvements will both open up new application areas for remote sensing, such as the assessment/monitoring of environmental impacts from dredging and offshore construction, and will strengthening existing applications, such as the assessment and monitoring of water quality in the context of the European Union Water Framework and Marine Strategy Framework Directives.
Point of contact: Veronique Creach (veronique.creach@cefas.co.uk) or Elisa Capuzzo (elisa.capuzzo@cefas.co.uk)

GEAR:

TV sledge: The sledge will be towed (0.7 Knot) against the tide and 10 minutes of good footage will be recorded. This corresponds to ~ 200m of track.

Multibeam: Change tower to side gantry. Multibeam has to cover the TV tracks and cross both sides of the ring. Multibeam needs to run slightly off set (~ 50m, speed 5 to 6 knots).

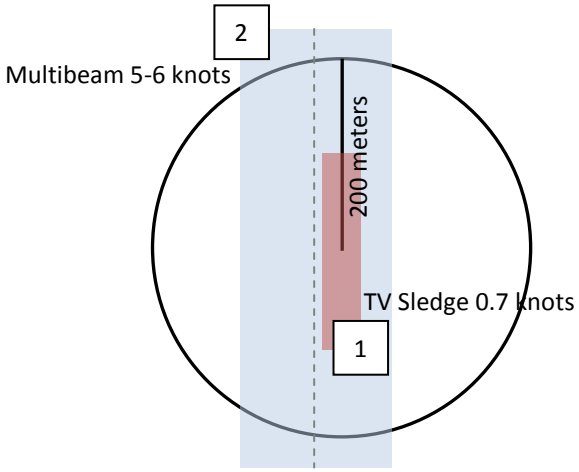

Figure 1. Representation of sledge tow (1) and multibeam tow (2) at station.

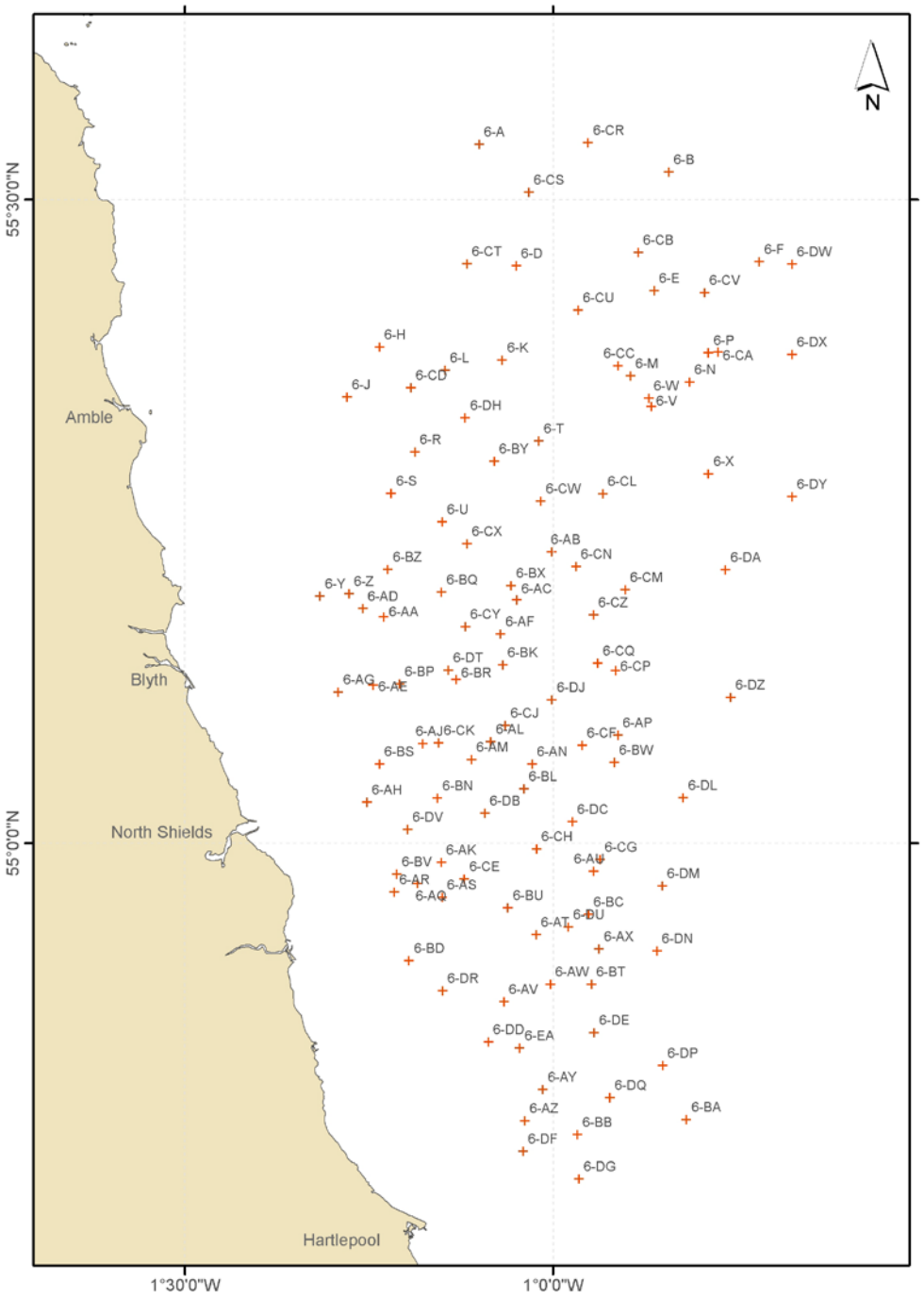

Figure 2. CEnd12/15 final stations for Farn Deeps area (FU6).

ANA LEOCADIO

(Scientist-in-Charge)

05 May 2015

DISTRIBUTION: Cefas staff (Ewen Bell; Robin Masefield; Matthew Parker-Humphreys; Jon Elson; Marc Whybrow; Karen Vanstaen; Rosslyn McIntyre; Shaun Doran; Nathan Edmonds); MMO (North Shields); NE IFCA.

Table 1. CEND12/15 station positions for the Farn Deeps area.

TVID	LatD	LatM	LongD	LongM	DecLat	DecLong
6-A	55	32.5405	-1	5.9825	55.5423	-1.0997
6-B	55	31.2705	0	50.5360	55.5212	-0.8423
6-D	55	26.9245	-1	2.9665	55.4487	-1.0494
6-E	55	25.7660	0	51.7270	55.4294	-0.8621
6-F	55	27.1150	0	43.1660	55.4519	-0.7194
6-H	55	23.1485	-1	14.1080	55.3858	-1.2351
6-J	55	20.8195	-1	16.7730	55.3470	-1.2795
6-K	55	22.5425	-1	4.1145	55.3757	-1.0686
6-L	55	22.0750	-1	8.7700	55.3679	-1.1462
6-M	55	21.8065	0	53.6600	55.3634	-0.8943
6-N	55	21.5175	0	48.8390	55.3586	-0.8140
6-P	55	22.8875	0	47.3105	55.3815	-0.7885
6-R	55	18.2770	-1	11.2245	55.3046	-1.1871
6-S	55	16.3355	-1	13.1550	55.2723	-1.2193
6-T	55	18.7905	-1	1.1415	55.3132	-1.0190
6-U	55	15.0270	-1	9.0000	55.2504	-1.1500
6-V	55	20.3955	0	51.9600	55.3399	-0.8660
6-W	55	20.7640	0	52.1560	55.3461	-0.8693
6-X	55	17.2445	0	47.3120	55.2874	-0.7885
6-Y	55	11.5520	-1	18.9570	55.1925	-1.3160
6-Z	55	11.6655	-1	16.5930	55.1944	-1.2766
6-AA	55	10.5855	-1	13.7555	55.1764	-1.2293
6-AB	55	13.6265	-1	0.0930	55.2271	-1.0016
6-AC	55	11.3755	-1	2.9350	55.1896	-1.0489
6-AD	55	10.9925	-1	15.4685	55.1832	-1.2578
6-AE	55	7.3930	-1	14.6260	55.1232	-1.2438
6-AF	55	9.7795	-1	4.2470	55.1630	-1.0708
6-AG	55	7.0760	-1	17.4725	55.1179	-1.2912
6-AH	55	1.9165	-1	15.1320	55.0319	-1.2522
6-AJ	55	4.6500	-1	10.5700	55.0775	-1.1762
6-AK	54	59.1040	-1	9.0790	54.9851	-1.1513
6-AL	55	4.7580	-1	5.0480	55.0793	-1.0841
6-AM	55	3.9190	-1	6.6260	55.0653	-1.1104
6-AN	55	3.7155	-1	1.6815	55.0619	-1.0280
6-AP	55	5.0640	0	54.6885	55.0844	-0.9115
6-AQ	54	58.1145	-1	11.0145	54.9686	-1.1836
6-AR	54	57.7100	-1	12.9065	54.9618	-1.2151
6-AS	54	57.4505	-1	9.0015	54.9575	-1.1500
6-AT	54	55.7030	-1	1.3515	54.9284	-1.0225
6-AU	54	58.6765	0	56.6800	54.9779	-0.9447
6-AV	54	52.5465	-1	3.9710	54.8758	-1.0662
6-AW	54	53.3690	-1	0.1850	54.8895	-1.0031
6-AX	54	55.0255	0	56.2345	54.9171	-0.9372
6-AY	54	48.4275	-1	0.8005	54.8071	-1.0133
6-AZ	54	46.9490	-1	2.2800	54.7825	-1.0380
6-BA	54	46.9985	0	49.0960	54.7833	-0.8183

6-BB	54	46.2940	0	57.9900	54.7716	-0.9665
6-BC	54	56.6560	0	57.0660	54.9443	-0.9511
6-BD	54	54.4800	-1	11.7040	54.9080	-1.1951
6-BK	55	8.3505	-1	4.0680	55.1392	-1.0678
6-BL	55	2.5395	-1	2.3485	55.0423	-1.0391
6-BN	55	2.1020	-1	9.3845	55.0350	-1.1564
6-BP	55	7.4605	-1	12.4680	55.1243	-1.2078
6-BQ	55	11.7365	-1	9.0545	55.1956	-1.1509
6-BR	55	7.6645	-1	7.8575	55.1277	-1.1310
6-BS	55	3.7130	-1	14.1035	55.0619	-1.2351
6-BT	54	53.3655	0	56.8425	54.8894	-0.9474
6-BU	54	56.9725	-1	3.6540	54.9495	-1.0609
6-BV	54	58.5370	-1	12.6950	54.9756	-1.2116
6-BW	55	3.7895	0	54.9875	55.0632	-0.9165
6-BX	55	12.0335	-1	3.3930	55.2006	-1.0565
6-BY	55	17.8435	-1	4.7670	55.2974	-1.0794
6-BZ	55	12.8030	-1	13.4300	55.2134	-1.2238
6-CA	55	22.9280	0	46.5375	55.3821	-0.7756
6-CB	55	27.5395	0	53.0340	55.4590	-0.8839
6-CC	55	22.2735	0	54.6865	55.3712	-0.9114
6-CD	55	21.2535	-1	11.5550	55.3542	-1.1926
6-CE	54	58.3090	-1	7.2080	54.9718	-1.1201
6-CF	55	4.5760	0	57.5980	55.0763	-0.9600
6-CG	54	59.2270	0	56.1380	54.9871	-0.9356
6-CH	54	59.7265	-1	1.3170	54.9954	-1.0220
6-CJ	55	5.5165	-1	3.8465	55.0919	-1.0641
6-CK	55	4.7055	-1	9.2940	55.0784	-1.1549
6-CL	55	16.3350	0	55.9150	55.2722	-0.9319
6-CM	55	11.8550	0	54.0750	55.1976	-0.9013
6-CN	55	12.9350	0	58.1000	55.2156	-0.9683
6-CP	55	8.0800	0	54.8800	55.1347	-0.9147
6-CQ	55	8.4150	0	56.3200	55.1402	-0.9387
6-CR	55	32.6215	0	57.1150	55.5437	-0.9519
6-CS	55	30.3300	-1	1.9465	55.5055	-1.0324
6-CT	55	27.0125	-1	6.9910	55.4502	-1.1165
6-CU	55	24.8635	0	57.9310	55.4144	-0.9655
6-CV	55	25.6790	0	47.6245	55.4280	-0.7937
6-CW	55	15.9795	-1	0.9605	55.2663	-1.0160
6-CX	55	14.0000	-1	6.9850	55.2333	-1.1164
6-CY	55	10.1215	-1	7.1140	55.1687	-1.1186
6-CZ	55	10.6740	0	56.6820	55.1779	-0.9447
6-DA	55	12.7935	0	45.9230	55.2132	-0.7654
6-DB	55	1.4035	-1	5.5210	55.0234	-1.0920
6-DC	55	0.9965	0	58.3980	55.0166	-0.9733
6-DD	54	50.6505	-1	5.2015	54.8442	-1.0867
6-DE	54	51.1000	0	56.6280	54.8517	-0.9438
6-DF	54	45.5120	-1	2.4110	54.7585	-1.0402
6-DG	54	44.2030	0	57.8560	54.7367	-0.9643
6-DH	55	19.8625	-1	7.1260	55.3310	-1.1188

6-DJ	55	6.7000	-1	0.0835	55.1117	-1.0014
6-DL	55	2.1165	0	49.3725	55.0353	-0.8229
6-DM	54	57.9890	0	51.0605	54.9665	-0.8510
6-DN	54	54.9440	0	51.4915	54.9157	-0.8582
6-DP	54	49.5390	0	51.0360	54.8257	-0.8506
6-DQ	54	48.0295	0	55.3390	54.8005	-0.9223
6-DR	54	53.0750	-1	8.9700	54.8846	-1.1495
6-DT	55	8.1025	-1	8.5145	55.1350	-1.1419
6-DU	54	56.0585	0	58.7305	54.9343	-0.9788
6-DV	55	0.6380	-1	11.8270	55.0106	-1.1971
6-DW	55	27.0000	0	40.5000	55.4500	-0.675
6-DX	55	22.8000	0	40.5000	55.3800	-0.675
6-DY	55	16.2000	0	40.5000	55.2700	-0.675
6-DZ	55	6.8311	0	45.5009	55.1139	-0.758348
6-EA	54	50.3640	-1	2.6958	54.8394	-1.04493

Dowsing SmartBuoy: 53.53 N 1.06 E