Centre for Environment Fisheries & Aquaculture Science

Cefas

RESEARCH VESSEL PROGRAMME

RV CEFAS ENDEAVOUR
Survey: C END 09 - 2020

STAFF:

Name	Role	Cabin	Shift
Chris Firmin	SIC	SIC cabin	08:00-20:00
Charlotte Reeve	2IC, watch lead & counter	C5	04:00-08:00/16:00-20:00
Karen Vanstaen	H&S, watch lead & counter	B1	08:00-12:00/20:00-24:00
Andy Lawler	Watch lead & counter	D5	12:00-16:00/00:00-04:00
Ben Hatton	Watch & counter	B2	04:00-08:00/08:00-12:00
Joanna Uzyczak	Watch & counter	C3	08:00-12:00/20:00-24:00
Hayden Close	Watch & counter	D4	12:00-16:00/00:00-04:00
Rodney Brash	Lifting ops, technician & data responsible	C4	On call
Eleanor Haigh	Deck watch and water sampling	C1	04:00-08:00/16:00-20:00
David Pearce	Deck watch and smart buoy	C2	08:00-12:00/20:00-24:00
Danja Hoehn	Deck watch and water sampling	D6	12:00-16:00/00:00-04:00

DURATION: **2nd-10th July (tbc)**

LOCATION: Farn Deeps grounds (Figures 1 & 2, Table 1)
West Gabbard 2, Warp and Dowsing sites (Figure 1, Table 2)
East Coast, Thames Plume, Humber, Tees, Tyne, Gt Yarmouth (Figure 1, Tables 2 & 3)

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) (MB002C – 7 days)

2. Service Noise Landers at Dowsing, Warp (SLA20A - 0.5 day)

3. Service SmartBuoys at West Gabbard 2 and Warp (SLA25SD - 1 day)

4. Secondary: Continuous flow and CTD Rosette water sampling as required

5. Secondary: Take daily water samples from the underway supply for filtering and freezing, used for Chlorophyll sampling as part of SLA25

6. Secondary: Collection of Zooplankton sample at West Gabbard

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PLAN:

CEFAS ENDEAVOUR will sail at 06:00 on 1st July from Lowestoft and will return to the same port on at XX:XX on 9th July 2020. This survey involves 24-hour procedures and the scientific staff will be working 4/8 hours shifts (3 people per shift) with one MIST engineer on call.

RV Cefas Endeavour will sail at 06:00hrs on Wednesday 1st July 2020 and steam south to the West Gabbard 2 site and carry out the following activities (objective: 3 & 6):

WGab1	Pre-recovery CTD
WGab2	Recover and deploy SmartBuoy (51° 57'.256N, 002° 06'.677E)
WGab3	Post-deployment CTD
WGab4	Zooplankton net haul sample (in area of 51° 57'.2N, 002° 07'.2E)

Endeavour will then transit to the Warp site and carry out the following activities (objective 2 & 3):

Warp1	Pre-recovery CTD
Warp2	Recover and deploy SmartBuoy (51° 32'.010N - 001° 02'.896E)
Warp3	Recover and deploy Noise Lander (51° 31'.946N - 001° 02'.804E)
Warp4	Post-deployment CTD

Overnight Endeavour will transit to the Dowsing site, obtaining continuous flow samples at (objective 4):

TP1CF	Water sample (51° 54'.43N, 001° 31'.35 E)
TP2CF	Water sample (52° 11'.56N, 001° 41'.08 E)

Once at Dowsing Endeavour will carry out the following activities (objective 2):

Dow1	Recover and deploy Noise Lander (53° 31'.737N, 001° 03'.208E)
Dow2	Post-deployment CTD

Once the mooring work is complete, we will head North to the Farn Deeps *Nephrops* grounds survey area obtaining CTD and continuous flow samples (objective 4) at:

Humb1	CTD / Rosette water sample (53° 32'.0N, 000° 20'.0E)
ECPM1CF	Water sample (54° 12'.0N, 000°, 0.0'E)
ECPM2CF	Water sample (54° 24'.0N, 000°, 21.0'W)
ECPM3CF	Water sample (54° 32'.40N, 000°, 36.0'W)
ECPM4CF	Water sample (54° 37'.20N, 000°, 51.0'W)

Once at the south of the Farn Deeps *Nephrops* grounds, Endeavour will carry out the following activities (objective 1 & 4):

FU6	110 TV camera sledge transects as shown in Figure 2 and detailed in table 2 (between 55° 35' - 54° 45' N and 1° 30' - 0 ° 40' W)
Tees1	CTD / Rosette water sample (54° 44'.0N, 000° 54'.0W)
Tyne1	CTD / Rosette water sample (55° 00'.5N, 000° 08'.0W)

Endeavour will carry out the following activities at the Farn Deeps ground if time permits (objective 4):

ISCTD1 / 6H	CTD / Water sample (55° 01'.914N, 1° 15' 132W)
ISCTD2 / 6AG	CTD / Water sample (55° 07'.074N, 1° 17'.472W)
ISCTD3 / 6Y	CTD / Water sample (55° 11'.550N, 1° 18'.96W)
NNS1 / 6BD	Water Sample (54° 54'.480N, 1° 11'.706W)
NNS2 / 6DC	Water Sample (55° 00'.996N, 0° 58'.398W)
NNS3 / 6DL	Water Sample (55° 02'.118N, 0° 49'.374W)
NNS4 / 6DD	Water Sample (54° 48'.100N, 1°.06'.000W)

During the survey we will be collecting underway water samples from the Ferrybox. Spatial CTD Rosette water samples will be collected at 04:00 daily and at 22:00 daily, if time permits.

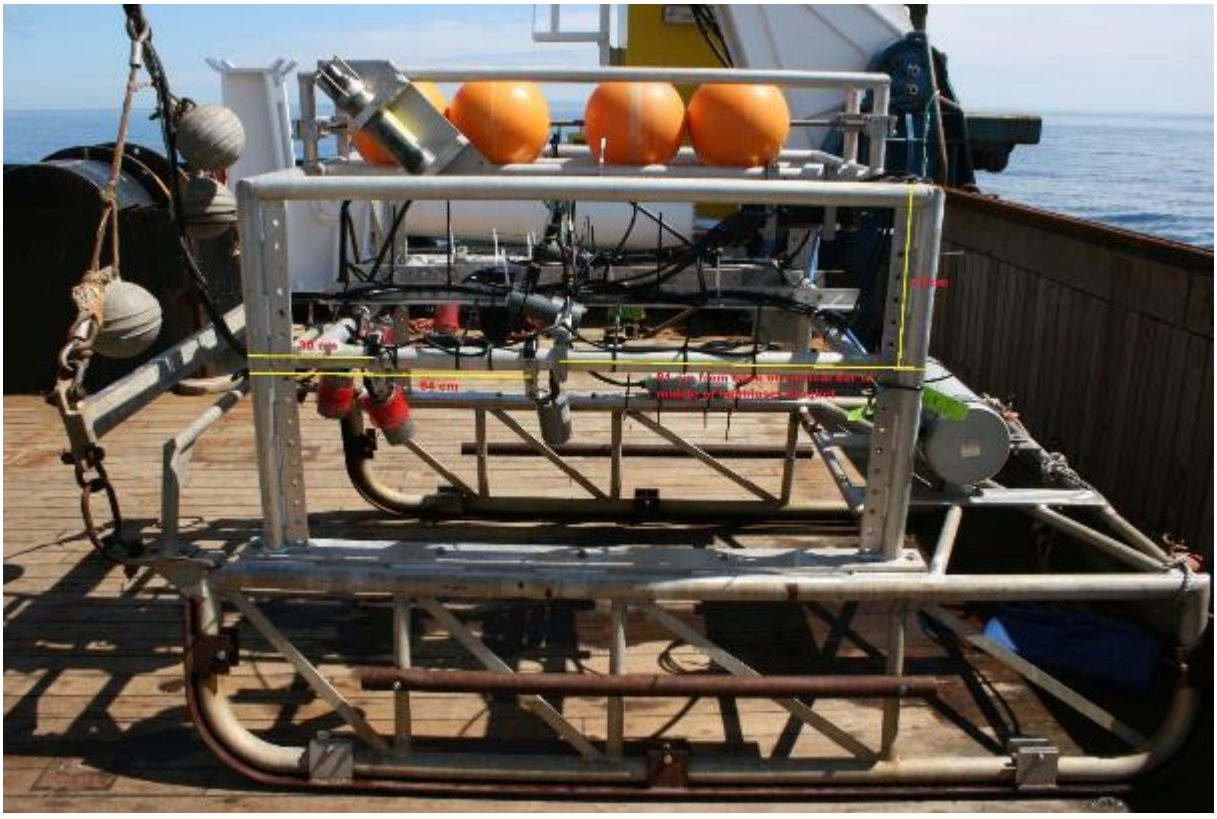
Endeavour will proceed back to Lowestoft, transiting over the following sites and obtaining continuous flow samples (objective 4), if time permits, at:

GrY1CF Water sample (52° 36'.088E, 1° 45'.982E)
GrY2CF Water sample (52° 34'.415E, 1° 46'.137E)

Endeavour will return to Lowestoft at XX:XX on 9th July

GEAR:

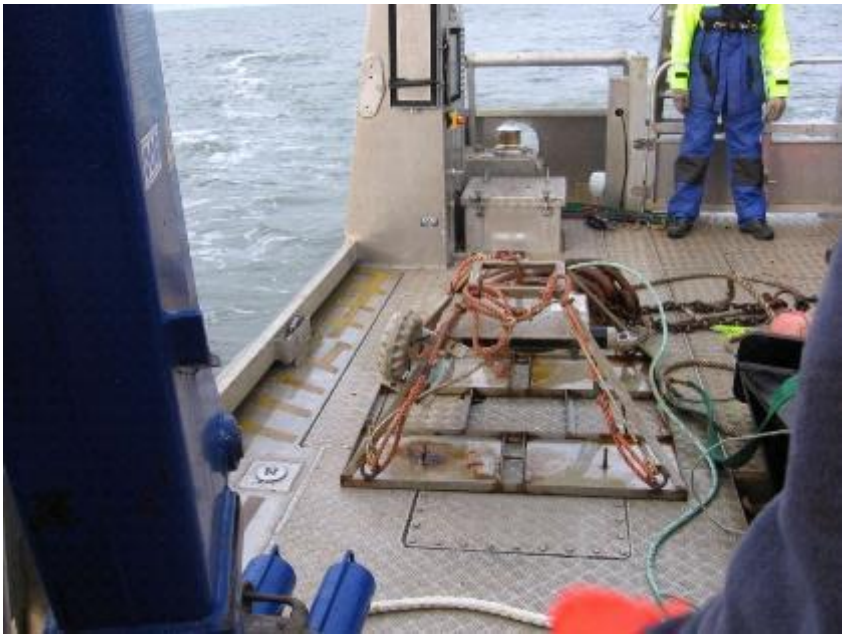
STR TV sledge: Setup with 2 fan lasers, 6 LED lights, HD camera and fibre optic umbilical. The sledge will be towed (0.7 Knot) against the tide and 10 minutes of good footage will be recorded, this corresponds to ~ 200m of track.



Cefas SmartBuoy with scientific instrumentation and satellite telemetry system

Cefas MiniLander fitted with ambient noise recording instrument and acoustic release

Cefas MicroLander fitted with ambient noise recording instrument



SBE CTD and niskin bottles to be deployed for water sampling and profiling

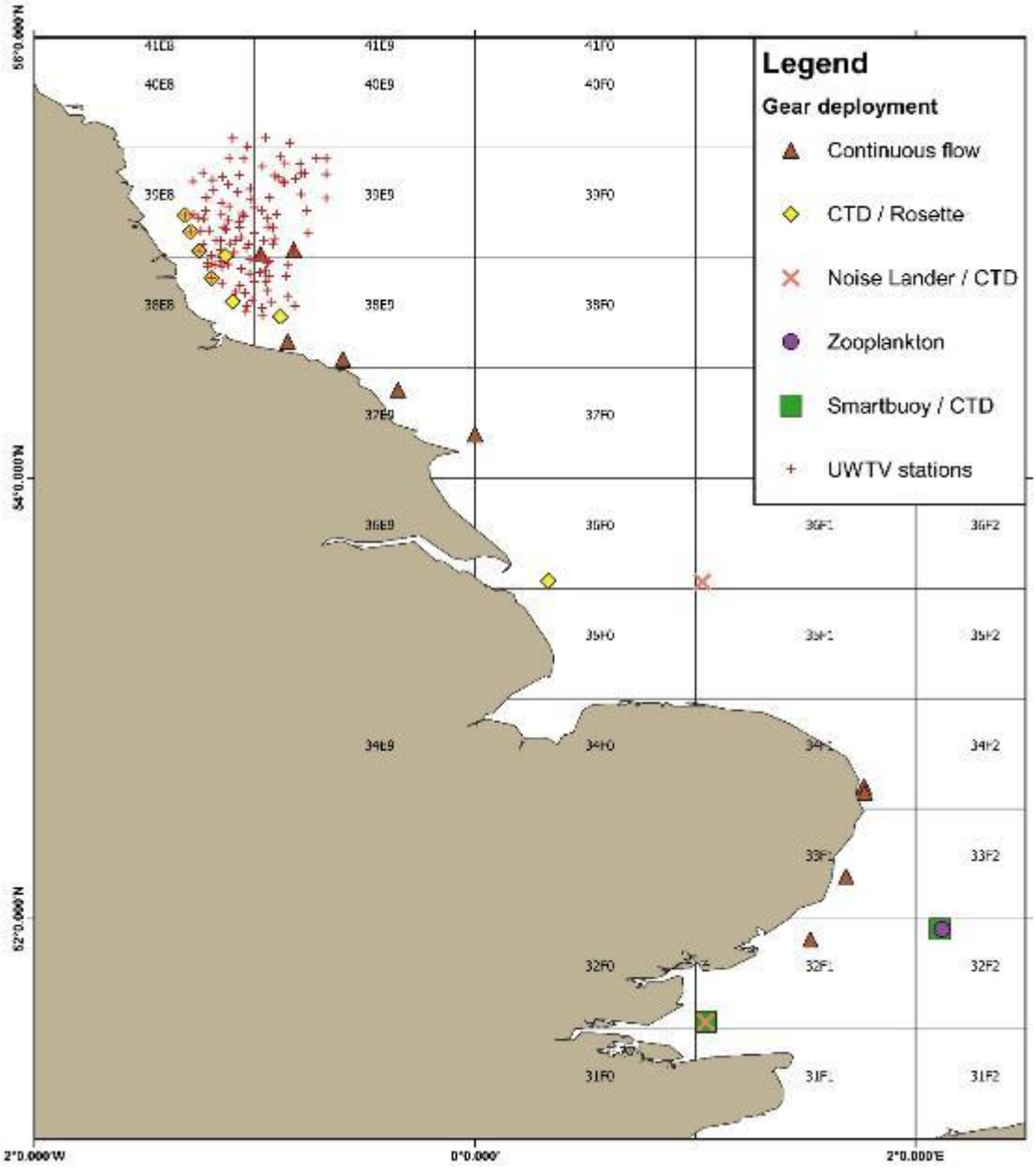


Figure 1. C END 09/20 station positions

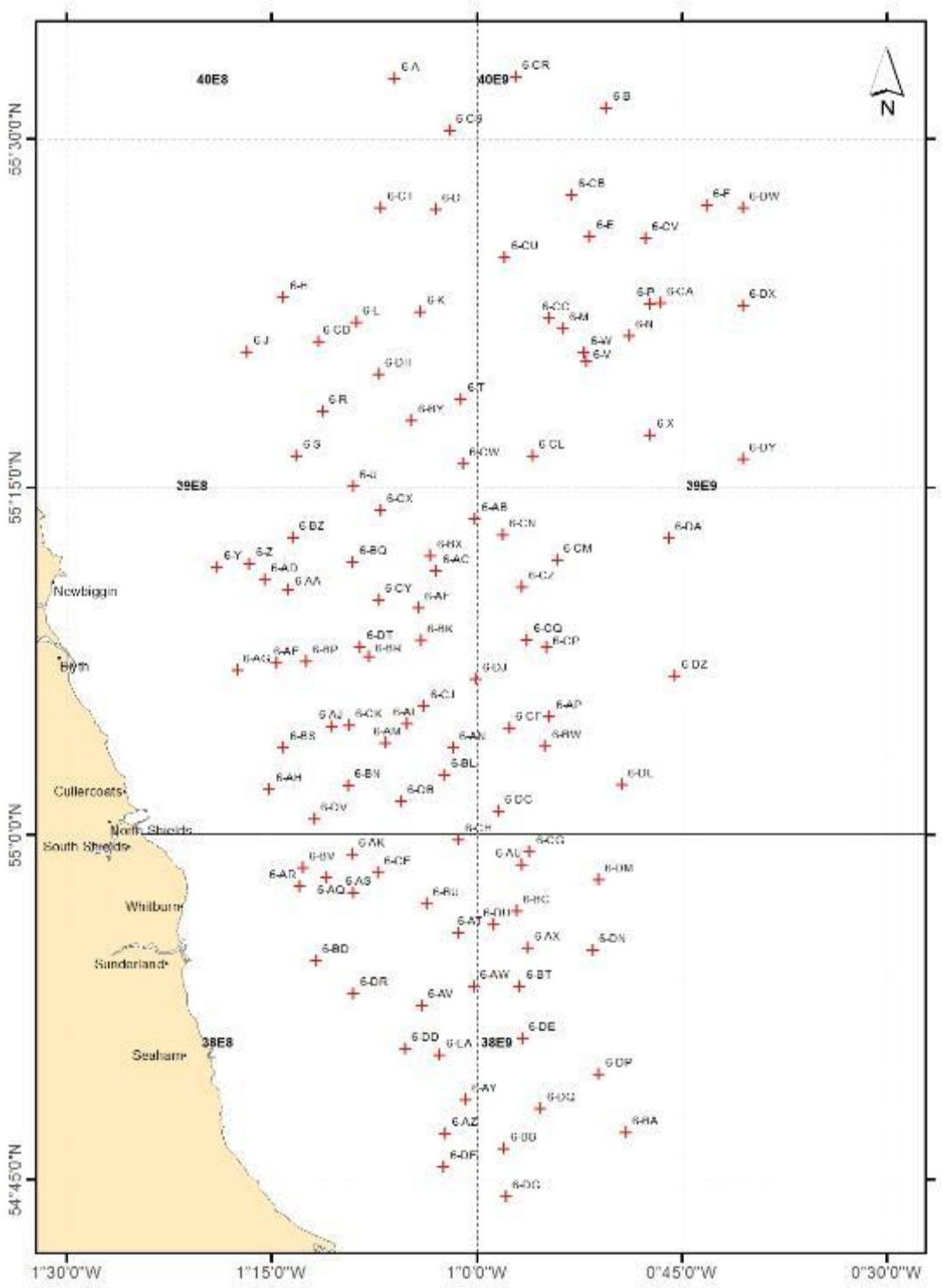


Figure 2. C END 09/20 TV station positions.

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Table 1. C END 09/20 station positions for the Farn Deeps (FU6) area (objective 1).

Area	TVID	LatD	LatM	LongD	LongM	DecLat	DecLong
FU6	**6-A**	55	32.5405	-1	5.9825	55.5423	-1.0997
FU6	**6-B**	55	31.2705	0	50.536	55.5212	-0.8423
FU6	**6-D**	55	26.9245	-1	2.9665	55.4487	-1.0494
FU6	**6-E**	55	25.766	0	51.727	55.4294	-0.8621
FU6	**6-F**	55	27.115	0	43.166	55.4519	-0.7194
FU6	**6-H**	55	23.1485	-1	14.108	55.3858	-1.2351
FU6	**6-J**	55	20.8195	-1	16.773	55.347	-1.2795
FU6	**6-K**	55	22.5425	-1	4.1145	55.3757	-1.0686
FU6	**6-L**	55	22.075	-1	8.77	55.3679	-1.1462
FU6	**6-M**	55	21.8065	0	53.66	55.3634	-0.8943
FU6	**6-N**	55	21.5175	0	48.839	55.3586	-0.814
FU6	**6-P**	55	22.8875	0	47.3105	55.3815	-0.7885
FU6	**6-R**	55	18.277	-1	11.2245	55.3046	-1.1871
FU6	**6-S**	55	16.3355	-1	13.155	55.2723	-1.2193
FU6	**6-T**	55	18.7905	-1	1.1415	55.3132	-1.019
FU6	**6-U**	55	15.027	-1	9	55.2504	-1.15
FU6	**6-V**	55	20.3955	0	51.96	55.3399	-0.866
FU6	**6-W**	55	20.764	0	52.156	55.3461	-0.8693
FU6	**6-X**	55	17.2445	0	47.312	55.2874	-0.7885
FU6	**6-Y***	55	11.552	-1	18.957	55.1925	-1.316
FU6	**6-Z**	55	11.6655	-1	16.593	55.1944	-1.2766
FU6	**6-AA**	55	10.5855	-1	13.7555	55.1764	-1.2293
FU6	**6-AB**	55	13.6265	-1	0.093	55.2271	-1.0016
FU6	**6-AC**	55	11.3755	-1	2.935	55.1896	-1.0489
FU6	**6-AD**	55	10.9925	-1	15.4685	55.1832	-1.2578
FU6	**6-AE**	55	7.393	-1	14.626	55.1232	-1.2438
FU6	**6-AF**	55	9.7795	-1	4.247	55.163	-1.0708
FU6	**6-AG***	55	7.076	-1	17.4725	55.1179	-1.2912
FU6	**6-AH***	55	1.9165	-1	15.132	55.0319	-1.2522
FU6	**6-AJ**	55	4.65	-1	10.57	55.0775	-1.1762
FU6	**6-AK**	54	59.104	-1	9.079	54.9851	-1.1513
FU6	**6-AL**	55	4.758	-1	5.048	55.0793	-1.0841
FU6	**6-AM**	55	3.919	-1	6.626	55.0653	-1.1104
FU6	**6-AN**	55	3.7155	-1	1.6815	55.0619	-1.028
FU6	**6-AP**	55	5.064	0	54.6885	55.0844	-0.9115
FU6	**6-AQ**	54	58.1145	-1	11.0145	54.9686	-1.1836
FU6	**6-AR**	54	57.71	-1	12.9065	54.9618	-1.2151
FU6	**6-AS**	54	57.4505	-1	9.0015	54.9575	-1.15
FU6	**6-AT**	54	55.703	-1	1.3515	54.9284	-1.0225
FU6	**6-AU**	54	58.6765	0	56.68	54.9779	-0.9447
FU6	**6-AV**	54	52.5465	-1	3.971	54.8758	-1.0662
FU6	**6-AW**	54	53.369	-1	0.185	54.8895	-1.0031

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FU6	**6-AX**	54	55.0255	0	56.2345	54.9171	-0.9372
FU6	**6-AY**	54	48.4275	-1	0.8005	54.8071	-1.0133
FU6	**6-AZ**	54	46.949	-1	2.28	54.7825	-1.038
FU6	**6-BA**	54	46.9985	0	49.096	54.7833	-0.8183
FU6	**6-BB**	54	46.294	0	57.99	54.7716	-0.9665
FU6	**6-BC**	54	56.656	0	57.066	54.9443	-0.9511
FU6	**6-BD***	54	54.48	-1	11.704	54.908	-1.1951
FU6	**6-BK**	55	8.3505	-1	4.068	55.1392	-1.0678
FU6	**6-BL**	55	2.5395	-1	2.3485	55.0423	-1.0391
FU6	**6-BN**	55	2.102	-1	9.3845	55.035	-1.1564
FU6	**6-BP**	55	7.4605	-1	12.468	55.1243	-1.2078
FU6	**6-BQ**	55	11.7365	-1	9.0545	55.1956	-1.1509
FU6	**6-BR**	55	7.6645	-1	7.8575	55.1277	-1.131
FU6	**6-BS**	55	3.713	-1	14.1035	55.0619	-1.2351
FU6	**6-BT**	54	53.3655	0	56.8425	54.8894	-0.9474
FU6	**6-BU**	54	56.9725	-1	3.654	54.9495	-1.0609
FU6	**6-BV**	54	58.537	-1	12.695	54.9756	-1.2116
FU6	**6-BW**	55	3.7895	0	54.9875	55.0632	-0.9165
FU6	**6-BX**	55	12.0335	-1	3.393	55.2006	-1.0565
FU6	**6-BY**	55	17.8435	-1	4.767	55.2974	-1.0794
FU6	**6-BZ**	55	12.803	-1	13.43	55.2134	-1.2238
FU6	**6-CA**	55	22.928	0	46.5375	55.3821	-0.7756
FU6	**6-CB**	55	27.5395	0	53.034	55.459	-0.8839
FU6	**6-CC**	55	22.2735	0	54.6865	55.3712	-0.9114
FU6	**6-CD**	55	21.2535	-1	11.555	55.3542	-1.1926
FU6	**6-CE**	54	58.309	-1	7.208	54.9718	-1.1201
FU6	**6-CF**	55	4.576	0	57.598	55.0763	-0.96
FU6	**6-CG**	54	59.227	0	56.138	54.9871	-0.9356
FU6	**6-CH**	54	59.7265	-1	1.317	54.9954	-1.022
FU6	**6-CJ**	55	5.5165	-1	3.8465	55.0919	-1.0641
FU6	**6-CK**	55	4.7055	-1	9.294	55.0784	-1.1549
FU6	**6-CL**	55	16.335	0	55.915	55.2722	-0.9319
FU6	**6-CM**	55	11.855	0	54.075	55.1976	-0.9013
FU6	**6-CN**	55	12.935	0	58.1	55.2156	-0.9683
FU6	**6-CP**	55	8.08	0	54.88	55.1347	-0.9147
FU6	**6-CQ**	55	8.415	0	56.32	55.1402	-0.9387
FU6	**6-CR**	55	32.6215	0	57.115	55.5437	-0.9519
FU6	**6-CS**	55	30.33	-1	1.9465	55.5055	-1.0324
FU6	**6-CT**	55	27.0125	-1	6.991	55.4502	-1.1165
FU6	**6-CU**	55	24.8635	0	57.931	55.4144	-0.9655
FU6	**6-CV**	55	25.679	0	47.6245	55.428	-0.7937
FU6	**6-CW**	55	15.9795	-1	0.9605	55.2663	-1.016
FU6	**6-CX**	55	14	-1	6.985	55.2333	-1.1164
FU6	**6-CY**	55	10.1215	-1	7.114	55.1687	-1.1186
FU6	**6-CZ**	55	10.674	0	56.682	55.1779	-0.9447

FU6	**6-DA**	55	12.7935	0	45.923	55.2132	-0.7654
FU6	**6-DB**	55	1.4035	-1	5.521	55.0234	-1.092
FU6	**6-DC***	55	0.9965	0	58.398	55.0166	-0.9733
FU6	**6-DD***	54	50.6505	-1	5.2015	54.8442	-1.0867
FU6	**6-DE**	54	51.1	0	56.628	54.8517	-0.9438
FU6	**6-DF**	54	45.512	-1	2.411	54.7585	-1.0402
FU6	**6-DG**	54	44.203	0	57.856	54.7367	-0.9643
FU6	**6-DH**	55	19.8625	-1	7.126	55.331	-1.1188
FU6	**6-DJ**	55	6.7	-1	0.0835	55.1117	-1.0014
FU6	**6-DL***	55	2.1165	0	49.3725	55.0353	-0.8229
FU6	**6-DM**	54	57.989	0	51.0605	54.9665	-0.851
FU6	**6-DN**	54	54.944	0	51.4915	54.9157	-0.8582
FU6	**6-DP**	54	49.539	0	51.036	54.8257	-0.8506
FU6	**6-DQ**	54	48.0295	0	55.339	54.8005	-0.9223
FU6	**6-DR**	54	53.075	-1	8.97	54.8846	-1.1495
FU6	**6-DT**	55	8.1025	-1	8.5145	55.135	-1.1419
FU6	**6-DU**	54	56.0585	0	58.7305	54.9343	-0.9788
FU6	**6-DV**	55	0.638	-1	11.827	55.0106	-1.1971
FU6	**6-DW**	55	27	0	40.5	55.45	-0.675
FU6	**6-DX**	55	22.8	0	40.5	55.38	-0.675
FU6	**6-DY**	55	16.2	0	40.5	55.27	-0.675
FU6	**6-DZ**	55	6.8311	0	45.5009	55.1139	-0.75835
FU6	**6-EA**	54	50.364	-1	2.6958	54.8394	-1.04493

*** Combined TV / water station (see table 3)**

Table 2. C END 09/20 Smartbuoy (SB), Noise Lander (NL), CTD, Zooplankton (P) and Rossette (R) and Continuous Flow (CF) water station positions (objectives 2, 3 ,5 & 6)

Area	StnID	Gear	LatD	LatM	LongD	LongM	DecLat	DecLong
West Gabbard	**WGab2**	**SB / CTD**	51	57.256	2	06.677	51.95427	2.111283
West Gabbard	**WGab4**	**P**	51	57.2	2	07.2	51.95333	2.12
Warp	**Warp2**	**SB / CTD**	51	32.010	1	02.896	51.5335	1.048267
Warp	**Warp3**	**NL / CTD**	51	31.946	1	02.804	51.53243	1.046733
Humber	**Humb1**	**CTD / R**	53	32.0	0	20.0	53.53333	0.333333
Dowsing	**Dow2**	**NL / CTD**	53	31.737	1	3.208	53.52895	1.032081
Tees	**Tees1**	**CTD / R**	54	44.0	0	53.0	54.73333	-0.88333
Tyne	**Tyne1**	**CTD / R**	55	00.5	-1	08.0	55.00833	-1.13333
East Coast PM	**ECPM1CF**	**CF**	54	12.0	0	0	54.2	0
East Coast PM	**ECPM2CF**	**CF**	54	24.0	0	21.0	54.4	-0.35
East Coast PM	**ECPM3CF**	**CF**	54	32.4	0	36.0	54.54	-0.6
East Coast PM	**ECPM4CF**	**CF**	54	37.2	0	51.0	54.62	-0.85
Thames Plume	**TP1CF**	**CF**	51	54.43	1	31.355	51.907	1.5226
Thames Plume	**TP2CF**	**CF**	52	11.56	1	41.075	52.193	1.685

Table 3. Additional CTD and Continuous Flow (CF) water station positions (objective 4)

Area	StnID	Gear	LatD	LatM	LongD	LongM	DecLat	DecLong
Northern North Sea IS	**ISCTD1 / 6AH**	**CTD / R**	55	1.914	-1	-15.132	55.0319	-1.2522
Northern North Sea IS	**ISCTD2 / 6AG**	**CTD / R**	55	7.074	-1	-17.472	55.1179	-1.2912
Northern North Sea IS	**ISCTD3 / 6Y**	**CTD / R**	55	11.55	-1	-18.96	55.1925	-1.316
Northern North Sea	**NNS1 / 6BD**	**CTD / R**	54	54.48	-1	-11.706	54.908	-1.1951
Northern North Sea	**NNS2 / 6DC**	**CF**	55	0.996	0	-58.398	55.0166	-0.9733
Northern North Sea	**NNS3 / 6DL**	**CF**	55	2.118	0	-49.374	55.0353	-0.8229
Northern North Sea	**NNS4 / 6DD**	**CTD / R**	54	48	-1	-6	54.8	-1.1
Great Yarmouth	**GrY1CF**	**CF**	52	36.088	1	45.982	52.60147	1.766367
Great Yarmouth	**GrY2CF**	**CF**	52	34.415	1	46.137	52.57358	1.76895

Chris Firmin
Scientist in Charge
16/06/2020

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