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**Vessel:** MV *Waterfall* (Moray First Marine)

**Survey 0922H**

## **PROGRAMME**

4-10 March 2023

### **Ports:**

**Loading:** Buckie, 3 March 2023

**Unloading:** Buckie, 10 March 2023

**Mid-survey load/unload (if needed):** Wick, 8 March 2023

In setting the survey programme and specific objectives, etc. the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the Survey Report, to I Gibb and the Survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a survey ending. In the case of the Survey Summary Report a nil return is required, if appropriate.

**Project:** 20696

**Gear:** Subsurface passive acoustic moorings (incl. fish tag detectors).

Moray East Offshore Windfarm – MEOW  
Beatrice Offshore Windfarm Ltd - BOWL

### **Objectives:**

1. To retrieve, service and redeploy 84 fish tracking moorings at in the BOWL and MEOW windfarms. See Figure 1 and Table 1 for deployment locations.
2. To deploy an array of 60 smolt detecting moorings to the north and to the south of the west side of the BOWL windfarm lease area. See Figure 2 and Table 2 for deployment locations.

The Waterfall will be loaded for the first set of deployments in Buckie on the morning of 3 March. Scientific staff will join on the vessel and complete the loading on the morning of 4 March.

The vessel will head towards the first set of moorings to be serviced on the morning of 4 March and continue to undertake windfarm mooring servicing duties until completion.

The deployments of the smolt detection array will commence once the servicing of the windfarm moorings is complete.

Another load of equipment including chain weights will be delivered to Wick harbour between 6 and 8 March to allow deployment operations to continue.

A daily program of work will be agreed between the SIC and vessel master.

A Notice to Mariners has been issued for all mooring locations. Any updates or location changes will be issued if required.

Notifications two days in advance will be issued to both BOWL and MEOW from the vessel when operating within their designated areas.

See below for figures and tables describing the locations to be studied.

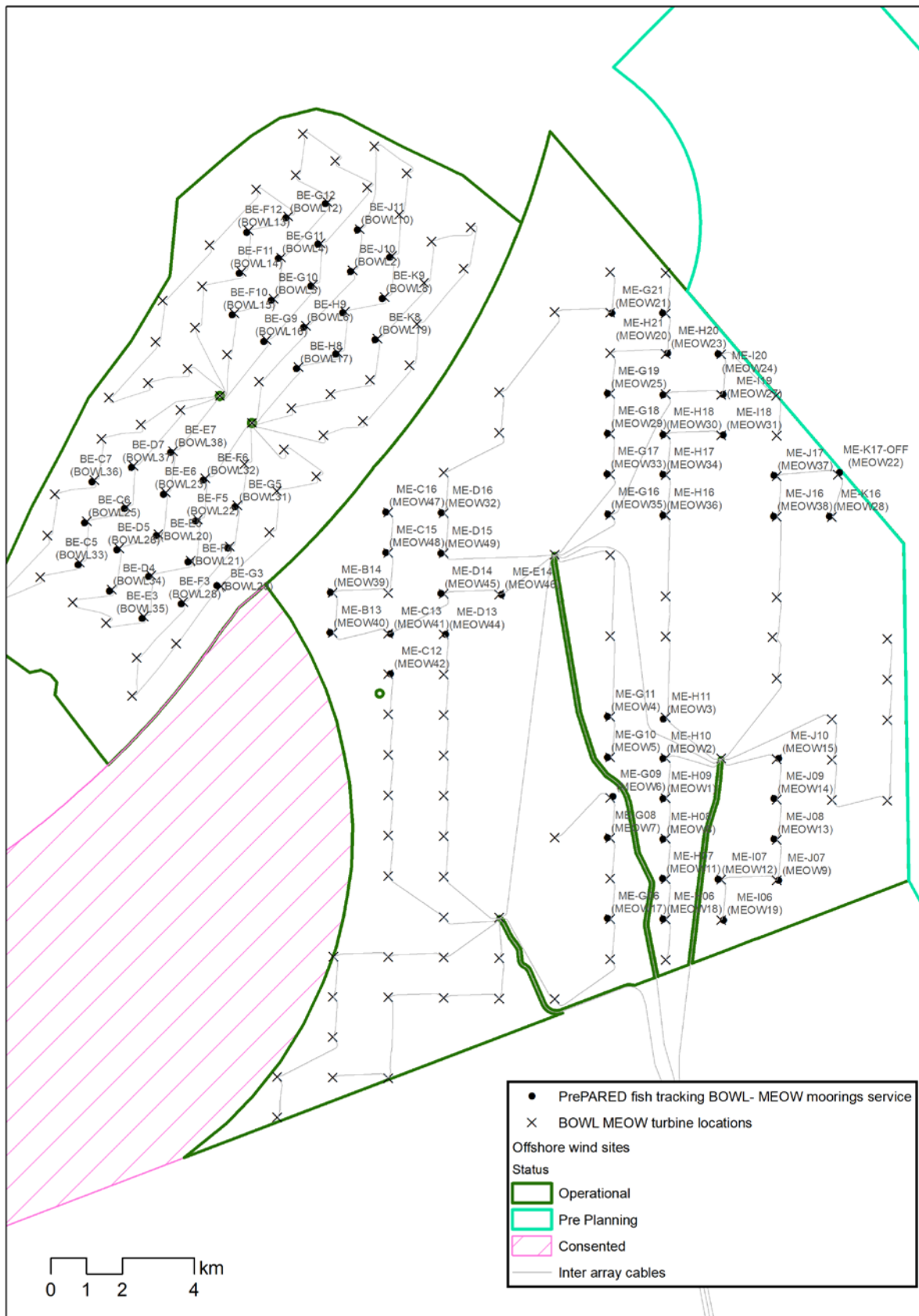
Normal contacts will be maintained with the laboratory.

**Submitted:**

R Watret  
02 March 2023

**Approved:**

I Gibb  
08 March 2023



**Figure 1:** Locations to be serviced within the BOWL and MEOW windfarms.

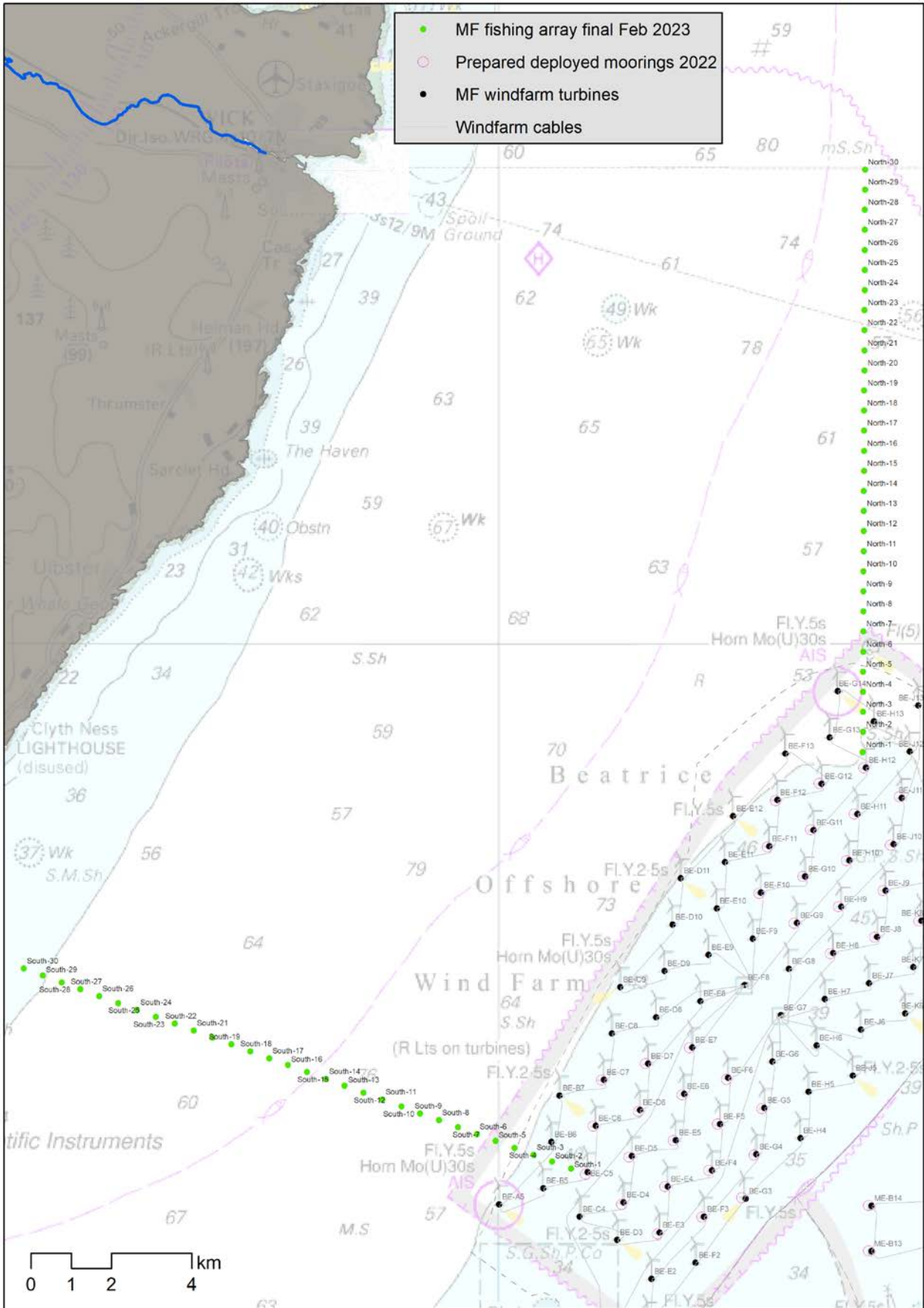


Figure 2: Locations for deployments of smolt moorings (green dots) to be deployed.

**Table 1:** Locations at the BOWL and MEOW windfarms where moorings will be serviced.

Turbine	LatDD	lonDD	LatDDM	LonDDM
BOWL -C5	58.214519	-2.96319	58° 12.8711 N	002° 57.7913 W
BOWL -C6	58.225073	-2.960064	58° 13.5043 N	002° 57.6038 W
BOWL -C7	58.235326	-2.956437	58° 14.1195 N	002° 57.3862 W
BOWL -D4	58.207966	-2.94827	58° 12.4779 N	002° 56.8962 W
BOWL -D5	58.218223	-2.944673	58° 13.0934 N	002° 56.6803 W
BOWL -D6	58.228573	-2.941198	58° 13.7143 N	002° 56.4718 W
BOWL -D7	58.238942	-2.937765	58° 14.3365 N	002° 56.2658 W
BOWL -E3	58.201019	-2.932761	58° 12.0611 N	002° 55.9656 W
BOWL -E4	58.211592	-2.929602	58° 12.6955 N	002° 55.7761 W
BOWL -E5	58.221837	-2.925966	58° 13.3102 N	002° 55.5579 W
BOWL -E6	58.232176	-2.922482	58° 13.9305 N	002° 55.3489 W
BOWL -E7	58.242643	-2.919116	58° 14.5585 N	002° 55.1469 W
BOWL -F10	58.277138	-2.889748	58° 16.6282 N	002° 53.3848 W
BOWL -F11	58.287574	-2.886361	58° 17.2544 N	002° 53.1816 W
BOWL -F12	58.297842	-2.882752	58° 17.8705 N	002° 52.9651 W
BOWL -F3	58.204671	-2.914161	58° 12.2802 N	002° 54.8496 W
BOWL -F4	58.215183	-2.91093	58° 12.9109 N	002° 54.6558 W
BOWL -F5	58.225482	-2.907319	58° 13.5289 N	002° 54.4391 W
BOWL -F6	58.235693	-2.903664	58° 14.1416 N	002° 54.2198 W
BOWL -G10	58.280802	-2.871102	58° 16.8481 N	002° 52.2660 W
BOWL -G11	58.291309	-2.867714	58° 17.4785 N	002° 52.0628 W
BOWL -G12	58.301459	-2.86404	58° 18.0875 N	002° 51.8424 W
BOWL -G3	58.209217	-2.897197	58° 12.5530 N	002° 53.8318 W
BOWL -G4	58.218651	-2.892003	58° 13.1190 N	002° 53.5202 W
BOWL -G5	58.229007	-2.888536	58° 13.7404 N	002° 53.3121 W
BOWL -G9	58.270487	-2.874645	58° 16.2292 N	002° 52.4787 W
BOWL -H10	58.284383	-2.852348	58° 17.0629 N	002° 51.1408 W
BOWL -H11	58.294828	-2.848913	58° 17.6896 N	002° 50.9347 W
BOWL -H12	58.30502	-2.845254	58° 18.3012 N	002° 50.7152 W
BOWL -H8	58.263623	-2.859256	58° 15.8173 N	002° 51.5553 W
BOWL -H9	58.274033	-2.855841	58° 16.4419 N	002° 51.3504 W
BOWL -J10	58.287963	-2.833387	58° 17.2777 N	002° 50.0032 W
BOWL -J11	58.298405	-2.830155	58° 17.9042 N	002° 49.8092 W
BOWL -J8	58.267262	-2.840587	58° 16.0356 N	002° 50.4352 W
BOWL -J9	58.277604	-2.83708	58° 16.6562 N	002° 50.2248 W
BOWL -K10	58.29152	-2.814793	58° 17.4912 N	002° 48.8875 W
BOWL -K8	58.270827	-2.82182	58° 16.2496 N	002° 49.3091 W
BOWL -K9	58.281181	-2.818304	58° 16.8708 N	002° 49.0982 W
MEOW -B13	58.1974	-2.843517	58° 11.8440 N	002° 50.6109 W
MEOW -B14	58.207517	-2.843417	58° 12.4509 N	002° 50.6049 W
MEOW -C12	58.187033	-2.814917	58° 11.2220 N	002° 48.8950 W

MEOW -C13	58.197067	-2.81495	58° 11.8240 N	002° 48.8970 W
MEOW -C15	58.21745	-2.817033	58° 13.0469 N	002° 49.0220 W
MEOW -C16	58.2276	-2.816983	58° 13.6560 N	002° 49.0189 W
MEOW -D13	58.19685	-2.788633	58° 11.8110 N	002° 47.3180 W
MEOW -D14	58.207117	-2.790833	58° 12.4270 N	002° 47.4500 W
MEOW -D15	58.217183	-2.79075	58° 13.0310 N	002° 47.4450 W
MEOW -D16	58.227367	-2.79055	58° 13.6419 N	002° 47.4330 W
MEOW -E14	58.206833	-2.7622	58° 12.4099 N	002° 45.7320 W
MEOW -G06	58.125483	-2.712417	58° 07.5290 N	002° 42.7450 W
MEOW -G08	58.145717	-2.712267	58° 08.7430 N	002° 42.7359 W
MEOW -G09	58.15605	-2.709733	58° 09.3630 N	002° 42.5840 W
MEOW -G10	58.165917	-2.71215	58° 09.9549 N	002° 42.7290 W
MEOW -G11	58.176117	-2.712017	58° 10.5669 N	002° 42.7209 W
MEOW -G16	58.226833	-2.711517	58° 13.6100 N	002° 42.6910 W
MEOW -G17	58.236967	-2.71165	58° 14.2180 N	002° 42.6990 W
MEOW -G18	58.247117	-2.7115	58° 14.8270 N	002° 42.6899 W
MEOW -G19	58.25715	-2.711333	58° 15.4290 N	002° 42.6800 W
MEOW -G21	58.27735	-2.709133	58° 16.6410 N	002° 42.5479 W
MEOW -H06	58.125267	-2.6861	58° 07.5160 N	002° 41.1660 W
MEOW -H07	58.135383	-2.686217	58° 08.1229 N	002° 41.1729 W
MEOW -H08	58.1453	-2.685967	58° 08.7179 N	002° 41.1580 W
MEOW -H09	58.155483	-2.685817	58° 09.3290 N	002° 41.1490 W
MEOW -H10	58.165533	-2.685833	58° 09.9319 N	002° 41.1499 W
MEOW -H11	58.17545	-2.6856	58° 10.5270 N	002° 41.1360 W
MEOW -H16	58.22655	-2.685233	58° 13.5930 N	002° 41.1140 W
MEOW -H17	58.236783	-2.68515	58° 14.2070 N	002° 41.1090 W
MEOW -H18	58.246783	-2.68515	58° 14.8070 N	002° 41.1090 W
MEOW -H19	58.256767	-2.685083	58° 15.4060 N	002° 41.1050 W
MEOW -H20	58.26715	-2.682783	58° 16.0290 N	002° 40.9670 W
MEOW -H21	58.277283	-2.684933	58° 16.6370 N	002° 41.0959 W
MEOW -I06	58.124933	-2.657483	58° 07.4959 N	002° 39.4490 W
MEOW -I07	58.135133	-2.65995	58° 08.1079 N	002° 39.5970 W
MEOW -I18	58.246633	-2.6566	58° 14.7980 N	002° 39.3960 W
MEOW -I19	58.256767	-2.656467	58° 15.4060 N	002° 39.3880 W
MEOW -I20	58.26695	-2.65865	58° 16.0169 N	002° 39.5189 W
MEOW -J07	58.134817	-2.63125	58° 08.0890 N	002° 37.8749 W
MEOW -J08	58.145167	-2.6334	58° 08.7099 N	002° 38.0039 W
MEOW -J09	58.155317	-2.633267	58° 09.3190 N	002° 37.9959 W
MEOW -J10	58.165433	-2.63095	58° 09.9259 N	002° 37.8570 W
MEOW -J16	58.226167	-2.632683	58° 13.5700 N	002° 37.9610 W
MEOW -J17	58.236367	-2.63245	58° 14.1820 N	002° 37.9470 W
MEOW -K16	58.226033	-2.6062	58° 13.5620 N	002° 36.3720 W
MEOW -K17-OFF	58.237017	-2.601333	58° 14.2209 N	002° 36.0799 W

**Table 2:** Locations for deployment of smolt detection array, North and South legs.

LatDD	lonDD	LatDDM	LonDDM	Name	Depth m
58.30889	-2.84548	58° 18.533' N	2° 50.729' W	North-1	-51.2
58.31338	-2.84543	58° 18.803' N	2° 50.726' W	North-2	-52.3
58.31787	-2.84537	58° 19.072' N	2° 50.722' W	North-3	-53.2
58.32236	-2.84532	58° 19.342' N	2° 50.719' W	North-4	-55.5
58.32685	-2.84527	58° 19.611' N	2° 50.716' W	North-5	-56.2
58.33134	-2.84521	58° 19.880' N	2° 50.713' W	North-6	-57.9
58.33583	-2.84516	58° 20.150' N	2° 50.710' W	North-7	-60.0
58.34032	-2.84511	58° 20.419' N	2° 50.706' W	North-8	-60.0
58.34481	-2.84506	58° 20.689' N	2° 50.703' W	North-9	-59.4
58.3493	-2.845	58° 20.958' N	2° 50.700' W	North-10	-58.2
58.35379	-2.84495	58° 21.228' N	2° 50.697' W	North-11	-59.7
58.35829	-2.8449	58° 21.497' N	2° 50.694' W	North-12	-60.3
58.36278	-2.84484	58° 21.767' N	2° 50.691' W	North-13	-63.2
58.36727	-2.84479	58° 22.036' N	2° 50.687' W	North-14	-65.1
58.37176	-2.84474	58° 22.305' N	2° 50.684' W	North-15	-65.0
58.37625	-2.84468	58° 22.575' N	2° 50.681' W	North-16	-64.2
58.38074	-2.84463	58° 22.844' N	2° 50.678' W	North-17	-63.0
58.38523	-2.84458	58° 23.114' N	2° 50.675' W	North-18	-61.8
58.38972	-2.84452	58° 23.383' N	2° 50.671' W	North-19	-62.9
58.39421	-2.84447	58° 23.653' N	2° 50.668' W	North-20	-61.8
58.3987	-2.84442	58° 23.922' N	2° 50.665' W	North-21	-60.4
58.40319	-2.84436	58° 24.191' N	2° 50.662' W	North-22	-58.4
58.40768	-2.84431	58° 24.461' N	2° 50.659' W	North-23	-62.7
58.41217	-2.84426	58° 24.730' N	2° 50.655' W	North-24	-63.6
58.41666	-2.8442	58° 25.000' N	2° 50.652' W	North-25	-64.6
58.42115	-2.84415	58° 25.269' N	2° 50.649' W	North-26	-65.5
58.42565	-2.8441	58° 25.539' N	2° 50.646' W	North-27	-63.9
58.43014	-2.84405	58° 25.808' N	2° 50.643' W	North-28	-62.0
58.43463	-2.84399	58° 26.078' N	2° 50.639' W	North-29	-62.1
58.43912	-2.84394	58° 26.347' N	2° 50.636' W	North-30	-63.0

LatDD	lonDD	LatDDM	LonDDM	Name	Depth m
58.21586	-2.96941	58° 12.951' N	2° 58.165' W	South-1	-40.0
58.2174	-2.9774	58° 13.044' N	2° 58.644' W	South-2	-41.9
58.21894	-2.9854	58° 13.137' N	2° 59.124' W	South-3	-47.9
58.22049	-2.99339	58° 13.229' N	2° 59.603' W	South-4	-56.1
58.22203	-3.00138	58° 13.322' N	3° 0.083' W	South-5	-58.7
58.22357	-3.00938	58° 13.414' N	3° 0.563' W	South-6	-61.0
58.22511	-3.01737	58° 13.507' N	3° 1.042' W	South-7	-62.8
58.22665	-3.02537	58° 13.599' N	3° 1.522' W	South-8	-64.0
58.22819	-3.03337	58° 13.691' N	3° 2.002' W	South-9	-66.3
58.22973	-3.04136	58° 13.784' N	3° 2.482' W	South-10	-69.5

58.23127	-3.04936	58° 13.876' N	3° 2.962' W	South-11	-72.0
58.23281	-3.05736	58° 13.968' N	3° 3.442' W	South-12	-75.5
58.23434	-3.06536	58° 14.061' N	3° 3.922' W	South-13	-74.5
58.23588	-3.07336	58° 14.153' N	3° 4.402' W	South-14	-74.8
58.23742	-3.08136	58° 14.245' N	3° 4.882' W	South-15	-72.9
58.23896	-3.08936	58° 14.337' N	3° 5.362' W	South-16	-68.3
58.24049	-3.09737	58° 14.429' N	3° 5.842' W	South-17	-67.9
58.24203	-3.10537	58° 14.522' N	3° 6.322' W	South-18	-68.2
58.24356	-3.11337	58° 14.614' N	3° 6.802' W	South-19	-67.5
58.2451	-3.12138	58° 14.706' N	3° 7.283' W	South-20	-63.9
58.24663	-3.12938	58° 14.798' N	3° 7.763' W	South-21	-63.8
58.24816	-3.13739	58° 14.890' N	3° 8.243' W	South-22	-65.6
58.2497	-3.1454	58° 14.982' N	3° 8.724' W	South-23	-65.1
58.25123	-3.1534	58° 15.074' N	3° 9.204' W	South-24	-64.1
58.25276	-3.16141	58° 15.166' N	3° 9.685' W	South-25	-61.2
58.25429	-3.16942	58° 15.257' N	3° 10.165' W	South-26	-59.9
58.25582	-3.17743	58° 15.349' N	3° 10.646' W	South-27	-58.1
58.25735	-3.18543	58° 15.441' N	3° 11.126' W	South-28	-54.5
58.25888	-3.19345	58° 15.533' N	3° 11.607' W	South-29	-51.4
58.26041	-3.20146	58° 15.625' N	3° 12.088' W	South-30	-48.8