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MRV *Scotia*

Survey 0519S

PROGRAMME

16-24 April 2019

Loading: Aberdeen, 16 April 2019

Unloading: Aberdeen, 24 April 2019

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 (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

Out-turn days per project: 10 days: ST05B

Gear

Sea-Bird CTDs, AUV, PIES, ADCPs and current meter instrumentation, water filtering equipment, mooring equipment, chemistry sampling equipment.

Objectives

1. Perform hydrographic sampling along the AlterEco monitoring section in the northern North Sea.
2. Recover and download an ADCP mooring deployed in a trawl-proof frame in the north of the Moray Firth.
3. Perform hydrographic sampling along the JONSIS long term monitoring section in the northern North Sea.
4. Recover, download and re-deploy one ADCP mooring at a position on Fair Isle – Munken (FIM/NWS) section.
5. Perform hydrographic sampling along the long term monitoring Faroe-Shetland Channel Nolso – Flugga (NOL/NWE) section.
6. Recover, download and re-deploy one ADCP mooring at a position on Faroe-Shetland Channel Nolso – Flugga section.
7. Deploy a second ADCP mooring off the shelf at a position on Faroe-Shetland Channel Nolso – Flugga section, deploy a PIES mooring nearby and deploy a buoyancy glider (AUV) in the same area.
8. Take water samples for long term storage on Fair Isle – Munken and/or Nolso – Flugga section stations.

9. Perform hydrographic sampling along the long term monitoring Faroe-Shetland Channel Fair Isle – Munken (FIM/NWS) section.
10. Run the thermosalinograph throughout the survey and VMADCP along hydrographic sections.
11. Perform hydrographic sampling in the vicinity of a number of ADCP moorings in order to calibrate moored equipment: CTD dips at selected locations with equipment (SB56 NanoCAT and/or SB57 MicroCAT) attached to carousel.
12. If sheltering in a suitable location around Shetland due to bad weather, conduct VMADCP/CTD work (e.g. Yell Sound).
13. Re-deploy the ADCP mooring in a trawl-proof frame recovered earlier in the Moray Firth in a nearby location in that area.
14. If weather/time permits, perform fine scale VMADCP/CTD survey work on the JONSIS line (around 59° 16.96' N, 001° 15.26' W).
15. If weather/time permits, perform VMADCP/CTD survey work in the Moray Firth and/or Aberdeen Bay.

Procedure

On sailing from Aberdeen *Scotia* will make passage to the start (western end) of the AlterEco monitoring section to carry out sampling with the CTD and carousel water sampler along the section. On completion of that section, *Scotia* will head to the mooring position in the Moray Firth to recover an ADCP mooring deployed in an AL200 trawl-proof frame, download the data and proceed to the JONSIS section to carry out sampling with the CTD and carousel water sampler. *Scotia* will then recover an ADCP mooring on the Fair Isle - Munken (FIM) section (NWSE). Data will be downloaded and the mooring will then be re-deployed there. *Scotia* will then make her way to the eastern start of the Nolso – Flugga (NOL) section and, depending on timings, either recover one ADCP mooring (NWEZ) along the way or start collecting long term monitoring samples and taking CTD profiles from the start of the section. At relevant locations along NOL mooring deployments will be carried out, with calibration CTD dips for instruments recovered from some of the moorings; overall, two ADCP moorings, one PIES mooring and a buoyancy glider (AUV) will be deployed. After the NOL section, *Scotia* will head to the western (Faroe) side of the FIM section to carry out standard CTD and water sampling along that line. Once that work is completed and if time allows, *Scotia* will attempt to re-deploy in a different location in the Moray Firth the mooring recovered there at the start of the survey and then carry out additional work (listed among the survey objectives) along the JONSIS line, in the Moray Firth and/or Aberdeen Bay, prior to her return to Aberdeen. If the weather requires sheltering in Shetland and any point during the survey, we will aim to collect additional CTD and VMADCP data in suitable locations (e.g. Yell Sound).

Mooring Positions (Recovery)

Moray Firth – 58° 18.47' N 002° 58.54' W
 NWSE – 60° 16.30' N 004° 20.77' W
 NWEZ – 61° 09.34' N 002° 17.35' W
 NWEA – 61° 38.01' N 004° 32.60' W (lost)

Mooring Positions (Deployment)

Moray Firth – 58° 16.80' N 002° 56.70' W (*)
NWSE – 60° 16.29' N 004° 20.78' W on FIM
NWEZ – 61° 09.30' N 002° 17.52' W on NOL
NWEX – 61° 11.00' N 002° 25.00' W on NOL
PIES – 61° 11.00' N 002° 25.00' W on NOL (in practice, small offset from NWEX)

(*) final position may change by a little

Scientific Procedures

It is expected that deployments of hydrographic equipment will be carried out with the CTD crane whilst the vessel is on station. The plankton crane will be used for the deployment of ADCP moorings in trawl-proof frame (AL200) and the PIES mooring. Single-string ADCP mooring deployments will be done from the trawl deck. The AUV will be lowered into the water from the hanger deck.

Two container laboratories will be required (one for water filtering and a dry container for communications with sampling equipment). Chlorophyll samples will be stored frozen in the freezer in the Fish House and nutrient samples will be stored in fish-free freezer down below.

(NOTE: The survey will take *Scotia* into the Foinaven Development Area. This is now standard practice and normal on-site communications will be established with the Foinaven co-ordinating officer).

Normal contacts will be maintained with the laboratory.

Submitted:
A Gallego
01 April 2019

Approved:
I Gibb
11 April 2019

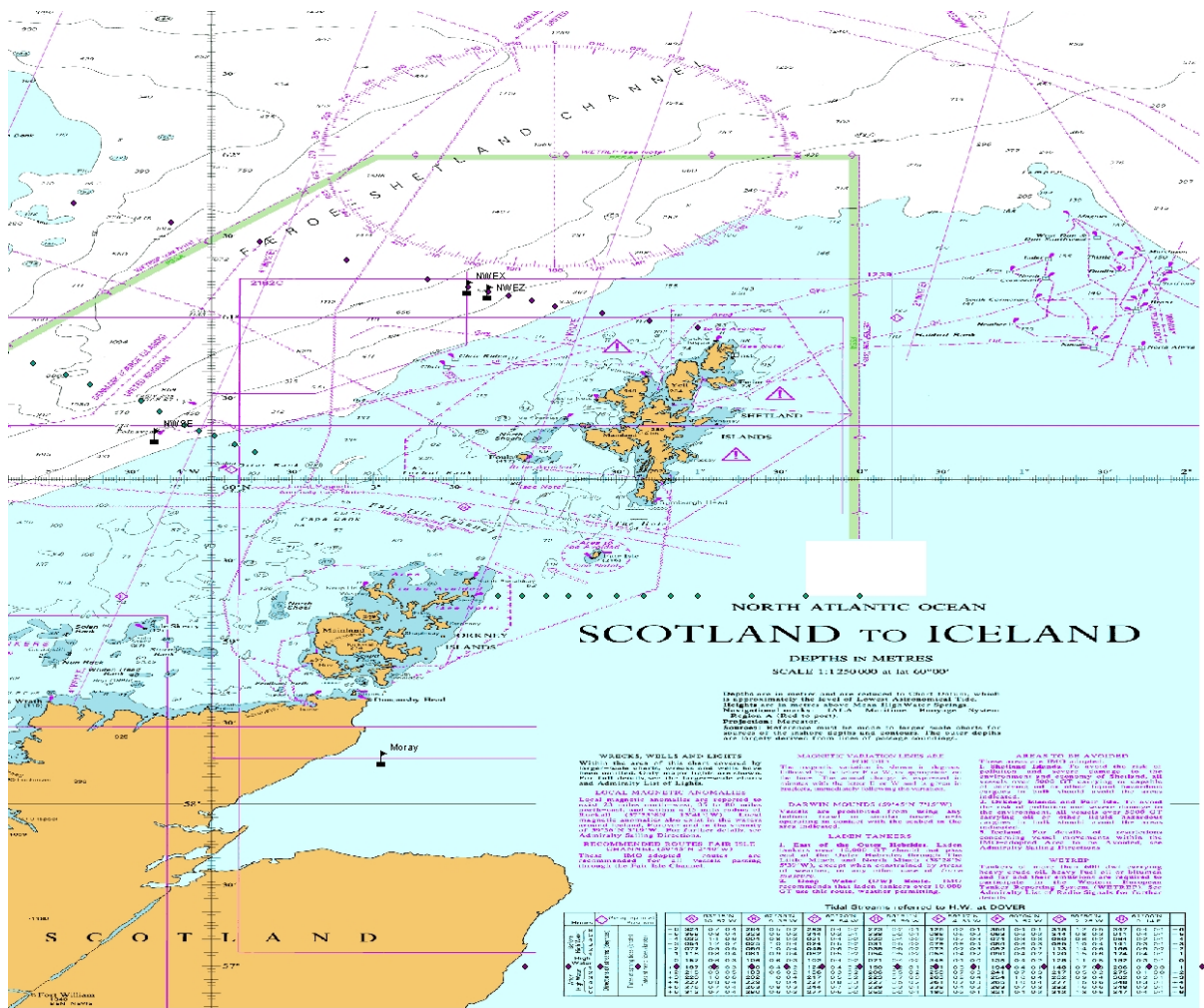


Chart with the position of the hydrographic sections (small diamonds) and the proposed position of the new mooring deployments (small flags with name labels)

ALTERECO Line

#	Name	Latitude	Longitude	Depth [m]	Spacing
01	AlterEco1	57° 00.00' N	02° 04.00' E	92	
02	AlterEco2	57° 00.00' N	01° 48.00' E	94	8.72 nm
03	AlterEco3	57° 00.00' N	01° 36.00' E	99	6.54 nm
04	AlterEco4	57° 00.00' N	01° 22.00' E	104	7.63 nm
05	AlterEco5	57° 00.00' N	01° 08.00' E	85	7.63 nm
06	AlterEco6	57° 00.00' N	00° 54.00' E	102	7.61 nm
07	AlterEco7	57° 00.00' N	00° 40.00' E	92	7.61 nm
08	AlterEco8	57° 00.00' N	00° 27.00' E	89	7.09 nm
09	AlterEco9	57° 00.00' N	00° 14.00' E	84	7.09 nm
10	AlterEco10	57° 00.00' N	00° 00.00' E	83	7.61 nm
11	AlterEco11	57° 00.00' N	00° 14.00' W	79	7.61 nm
12	AlterEco12	57° 00.00' N	00° 28.00' W	82	7.63 nm
13	AlterEco13	57° 00.00' N	00° 42.00' W	68	7.63 nm
14	AlterEco14	57° 00.00' N	00° 55.00' W	75	7.07 nm
15	AlterEco15	57° 00.00' N	01° 08.00' W	67	7.07 nm
16	AlterEco16	57° 00.00' N	01° 28.00' W	68	10.91 nm
17	AlterEco17	57° 00.00' N	01° 47.00' W	98	10.56 nm
18	<i>AlterEco18</i>	<i>56° 57.80' N</i>	<i>02° 06.80' W</i>	47	<i>10.78 nm</i>
Totals				1508 m	136.83 nm

JONSIS Line

#	Name	Latitude	Longitude	Depth	Spacing
01	JO 1	59° 17.00' N	02° 14.00' W	75 m	
02	JO 1A	59° 17.00' N	02° 5.00' W	90 m	4.59 nm
03	JO 2	59° 17.00' N	01° 56.00' W	100 m	4.59 nm
04	JO 3	59° 17.00' N	01° 48.00' W	80 m	4.08 nm
05	JO 4	59° 17.00' N	01° 40.00' W	90 m	4.08 nm
06	JO 5	59° 17.00' N	01° 30.00' W	95 m	5.10 nm
07	JO 6	59° 17.00' N	01° 20.00' W	110 m	5.10 nm
08	JO 6A	59° 17.00' N	01° 10.00' W	120 m	5.10 nm
09	JO 7	59° 17.00' N	01° 0.00' W	125 m	5.10 nm
10	JO 8	59° 17.00' N	00° 40.00' W	120 m	10.20 nm
11	JO 9	59° 17.00' N	00° 20.00' W	140 m	10.20 nm
12	JO10	59° 17.00' N	00° 0.00' W	135 m	10.20 nm
Totals				1180 m	68.36 nm

Fair Isle - Munken (Amended for presence of Foinaven oil platform*)

#	Name	Latitude	Longitude	Depth	Spacing
01	FIM-01	60° 10.00' N	03° 44.00' W	150 m	
02	SEFF1	60° 13.00' N	03° 51.50' W	170 m	4.74 nm
03	FIM-02	60° 16.00' N	03° 59.00' W	200 m	4.84 nm
04	SEFF2	60° 18.00' N	04° 04.50' W	330 m	3.36 nm
* 05	<i>FIM-03</i>	<i>60° 20.00' N</i>	<i>04° 10.00' W</i>	<i>390 m</i>	<i>3.03 nm</i>
06	FIM-04	60° 25.00' N	04° 19.00' W	655 m	6.88 nm
07	FIM-05	60° 29.00' N	04° 26.00' W	995 m	5.45 nm
08	FIM-06	60° 35.00' N	04° 45.00' W	1090 m	11.15 nm
09	FIM-6a	60° 38.00' N	04° 54.00' W	1030 m	5.33 nm
10	FIM-07	60° 43.00' N	05° 06.00' W	915 m	7.70 nm
11	FIM-08	60° 47.00' N	05° 16.00' W	830 m	6.34 nm
12	FIM-09	60° 51.00' N	05° 29.00' W	600 m	7.36 nm
13	FARF3	60° 56.70' N	05° 42.80' W	333 m	8.90 nm
14	FIM-10	61° 02.00' N	05° 57.00' W	280 m	8.68 nm
15	FARF2	61° 07.20' N	06° 09.40' W	250 m	7.95 nm
16	FIM-11	61° 12.00' N	06° 22.00' W	240 m	7.67 nm
17	FARF1	61° 16.40' N	06° 37.70' W	100 m	8.80 nm
Totals				8,558 m	108.18 nm

Nolso-Flugga

#	Name	Latitude	Longitude	Depth	Spacing
01	NOL-01	60° 56.00' N	01° 00.00' W	110 m	
02	SEFN1	60° 58.70' N	01° 17.70' W	125 m	9.00 nm
03	SEFN2	61° 01.40' N	01° 35.40' W	155 m	8.99 nm
04	NOL-02	61° 04.00' N	01° 53.00' W	270 m	8.91 nm
05	SEFN3	61° 06.00' N	02° 01.50' W	440 m	4.57 nm
06	NOL-03	61° 08.00' N	02° 10.00' W	550 m	4.57 nm
07	SEFN4	61° 09.30' N	02° 17.50' W	630 m	3.85 nm
08	NOL-3a	61° 11.00' N	02° 25.00' W	730 m	3.98 nm
09	NOL-04	61° 14.00' N	02° 40.00' W	1080 m	7.82 nm
10	NOL-05	61° 21.00' N	03° 10.00' W	1370 m	16.03 nm
11	NOL-06	61° 28.00' N	03° 42.00' W	1235 m	16.84 nm
12	FARN2	61° 32.00' N	03° 57.00' W	1200 m	8.18 nm
13	NOL-07	61° 35.00' N	04° 15.00' W	990 m	9.08 nm
14	FARN1	61° 38.00' N	04° 33.00' W	530 m	9.07 nm
15	NOL-08	61° 42.00' N	04° 51.00' W	235 m	9.44 nm
16	NOL-09	61° 49.00' N	05° 21.00' W	180 m	15.84 nm
17	NOL-10	61° 54.00' N	05° 45.00' W	290 m	12.37 nm
18	NOL-11	62° 00.00' N	06° 12.00' W	125 m	14.04 nm
Totals				10245 m	162.60 nm