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MRV *Scotia*

Survey 0618S

## **PROGRAMME**

2 May – 12 May 2018

**Loading:** Aberdeen, 30 April 2018

**Unloading:** Aberdeen, 12 May 2018

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

## **Personnel**

A Gallego (SIC)  
M Geldart  
H Smith  
D Lee  
M Rennie  
A Taylor  
C Nikolova (Visitor Heriot-Watt University (HWU))  
R Gilchrist (Visitor University of East Anglia (UEA))

**Out-turn days per project:** 10 days: ST05B

## **Gear**

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

## **Objectives**

1. Perform hydrographic sampling along the AlterEco monitoring section in the northern North Sea, which will be sampled in all MSS oceanographic cruises in 2018.
2. Perform hydrographic sampling along the JONSIS long term monitoring section in the northern North Sea.
3. Recover, download and re-deploy an ADCP mooring deployed in a trawl-proof frame on the JONSIS section (the "AlterEco mooring", AECO).
4. Recover and download the data from one ADCP mooring deployed on Faroe-Shetland Channel Faroe – Cape Wrath (FCW/NWZ) section, in the vicinity of the

Wyville-Thomson Ridge (NWZE).

5. Recover, download and re-deploy one ADCP mooring at a position on Fair Isle – Munken (FIM/NWS) section.
6. Take surface water samples at a suitable location in the Faroe Shetland Channel for bacterial analysis and experimentation (HWU).
7. Perform hydrographic sampling along the long term monitoring Faroe-Shetland Channel Nolso – Flugga (NOL/NWE) section.
8. Recover, download and re-deploy two ADCP moorings at positions on Faroe-Shetland Channel Nolso – Flugga section.
9. Take water samples for long term storage on Fair Isle – Munken or Nolso – Flugga section stations.
10. Perform hydrographic sampling along the long term monitoring Faroe-Shetland Channel Fair Isle – Munken (FIM/NWS) section.
11. Run the thermosalinograph throughout the survey.
12. 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.
13. If sheltering in a suitable location around Shetland due to bad weather, conduct VMADCP/CTD work in Shetland (e.g. Yell Sound) and short-term mooring deployment and recovery.
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.

## **Narrative**

On sailing from Aberdeen *Scotia* made 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* headed to the JONSIS section to carry out sampling with the CTD and carousel water sampler. At the end of that work, an ADCP mooring deployed on JONSIS in an AL200 traw-proof frame (AECO) was recovered. The intention was to download, service and re-deploy the mooring near the original position but the line connecting on release the top of the mooring (flotation + instruments) with the bottom base got snagged around the ship's rudder and, despite numerous attempts, had to be cut, with the loss of the base. Therefore, we were unable to re-deploy that mooring. Passage was then made towards the NWZE mooring location near the Wyville-Thomson Ridge to recover and download an ADCP mooring. Conditions were unsuitable for mooring work on 5 May so *Scotia* dodged near the mooring position until the morning of 6 May, when conditions improved dramatically and the NWZE mooring was recovered successfully. Then, *Scotia* sailed to the position of mooring NWSE but the acoustic release failed to respond to interrogation or release commands, so we were forced to give up on that mooring, which is

located in an area unsuitable for creeping, and deployed there a new mooring with the instrument recovered from NWZE, instead, after replacing the batteries and re-programming it. Following that, a calibration dip of some instruments recovered from NWZE was carried out and surface water for bacterial work by the HWU visitor was collected. *Scotia* then made her way to the eastern side of the Nolso – Flugga (NOL) section, arriving in the early hours of 7 May. *Scotia* collected hydrographic data along NOL, stopping to recover and re-deploy one ADCP mooring (NWEZ) along the way and subsequently resuming the section up to the location of mooring NWEA. The acoustic release for this mooring responded to interrogation and release commands but failed to release, so *Scotia* spent several hours creeping, in the hope of making contact with the trawl-proof frame to facilitate its release but without success. Following this mooring recovery attempt, the NOL section was completed by the end of 8 May and *Scotia* proceeded to the Faroese end of the Fair Isle-Munken line (FIM), to start CTD and water sampling (including samples for Long Term Storage). Large swells and a worsening forecast for the next few hours forced us to abandon the line at the FIM-05 station (going east) and head towards Yell Sound, in Shetland, where 2 short term (> 13 h) current meter moorings were deployed on 10 May and the VMADCP on *Scotia* was run at a stationary position overnight. Those moorings were recovered first thing in the morning on 11 May and a VMADCP transect of the length of Yell Sound was carried out as we made our way to the east side of Shetland. On the way back to Aberdeen, *Scotia* carried out additional work (fine resolution CTD survey) along the JONSIS line, arriving in Aberdeen in the early afternoon of 12 May.

The TSG was run throughout the survey and VMADCP data were collected along the standard monitoring lines and in Yell Sound.

### **Mooring Positions (Recovery)**

AECO - 59° 16.96' N 001° 15.26' W (trawlproof frame base lost on recovery)

NWZE – 59° 54.56' N 006° 10.14' W

NWEA – 61° 38.01'N 004° 32.60'W (mooring failed to surface; recovery unsuccessful)

NWEZ – 61° 09.32' N 002° 17.39' W

NWSE – 60° 16.34' N 004° 20.67' W (no response from acoustic release; recovery unsuccessful).

### **Mooring Positions (Deployment)**

AECO - 59° 17.00' N 001° 15.00' W on JONSIS abandoned due to lack of a complete frame.

NWEA – 61° 38.00 N 004° 33.00 W on NOL abandoned due to a lack of replacement instrument

NWEZ – 61° 9.30 N 002° 17.52 W on NOL

NWSE – 60° 16.29' N 004° 20.78' W on FIM

### **Short-term Mooring Positions (Deployment and Recovery)**

YELL1 - 60° 37.48' N 001° 15.23' W

YELL2 - 60° 34.31' N 001° 14.15' W

### **Scientific Procedures**

Deployments of hydrographic equipment were carried out with the CTD crane whilst the vessel was on station. Single-string mooring deployments were done from the trawl deck.

Three container laboratories were used (one wet chemical analysis laboratory, one for water filtering and a dry container for communications with sampling equipment). Chlorophyll samples were stored frozen in the freezer in the Fish House and salinity samples were collected for subsequent analysis in the laboratory. Nutrients and oxygen samples were analysed on board.

Normal contacts were maintained with the laboratory.

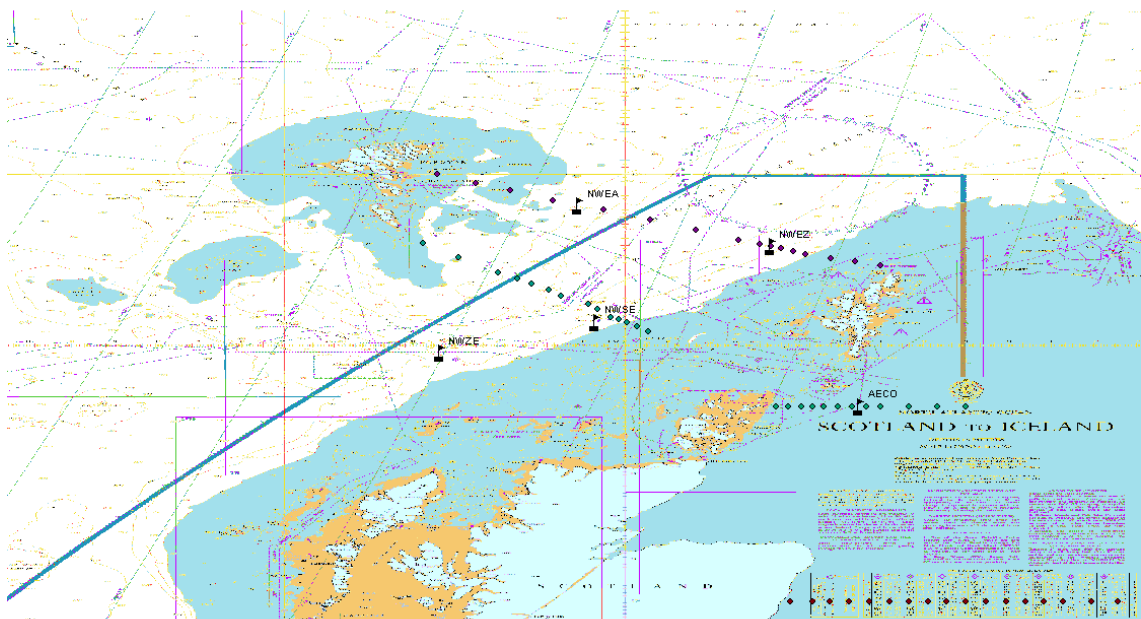
## Sampling

Overall, 74 hydrographic stations were completed. 291 nutrient samples were collected, as well as 154 chlorophyll (34 for TSG calibration), 96 oxygen and 120 (34 for TSG calibration) salinity calibration samples.

Submitted:  
Alejandro Gallego  
12 May 2018

Approved:  
I Gibb  
XX May 2018

Legend: dots are CTD stations; flags indicate ADCP mooring positions



**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

**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

**Fair Isle – Munken (only completed stations shown)**

#	Name	Latitude	Longitude	Depth	Spacing
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

## 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

## JONSIS fine resolution CTD survey

#	latitude			longitude			Distance (nm)	depth	name
1	59	17.00	N	01	20.00	W	0.50	114	JO6_VM12
2	59	17.00	N	01	19.02	W	0.50	114	JO6_VM11
3	59	17.00	N	01	18.04	W	0.50	114	JO6_VM10
4	59	17.00	N	01	17.06	W	0.50	109	JO6_VM9
5	59	17.00	N	01	16.08	W	0.50	109	JO6_VM8
6	59	17.00	N	01	15.10	W	0.50	112	JO6_VM7
7	59	17.00	N	01	14.12	W	0.50	115	JO6_VM6
8	59	17.00	N	01	13.14	W	0.50	117	JO6_VM5
9	59	17.00	N	01	12.16	W	0.50	118	JO6_VM4
10	59	17.00	N	01	11.18	W	0.50	117	JO6A_VM3
11	59	17.00	N	01	10.20	W		121	JO6A_VM2

