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MRV *Scotia*

Survey 0519S

REPORT

17-25 April 2019

Loading: Leith, 17 April 2019

Unloading: Aberdeen, 25 April 2019

Out-turn days per project: 9 days to 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.

Narrative

Due to issues with *Scotia* during her refit resulting in delayed availability, loading of scientific equipment and staff took place in Leith instead of Aberdeen, on 17 April. *Scotia* then sailed towards the mooring positions in the Faroe-Shetland Channel, making a test CTD cast in the North Sea along the way north. Prior to any mooring work, an instrument pre-deployment calibration and CTD cast was made on arrival during the night at a suitable water depth (west of the NWSE mooring position). The following morning (19 Apr.) mooring NWSE was turned around and *Scotia* made passage to mooring position NWEZ, where another mooring was recovered and re-deployed and a post-deployment calibration and CTD cast was made. Then we moved to mooring position NWEX, where another ADCP mooring was deployed. At first light on 20 Apr., *Scotia* deployed a buoyancy glider on position NWEX and most of the day (until late afternoon) was spent on getting a PIES ready for deployment, which was finally successfully achieved. Following this deployment, *Scotia* sailed to the western end of a shortened Nolso-Flugga line and started hydrographic sampling with the CTD and rosette from station NOL-06 towards Shetland. The Fair Isle-Munken section was dropped from the programme due to the reduced survey duration. Near its original deployment position, *Scotia* was diverted on a 2.5 h round trip to recover the glider, which was malfunctioning. On completion of the Nolso-Flugga, *Scotia* sailed to the eastern end of the JONSIS line for hydrographic sampling, which was completed on Mon. 22 April. Thereafter, *Scotia* headed to the Moray Firth to recover a mooring in a trawl-proof frame, which was carried out successfully (re-deployment was not possible due to logistic issues). After this, we sailed to the eastern end of the AlterEco section. Weather conditions slowed down our progress so a number of lower priority stations were dropped from the sampling plan, although subsequent good progress resulted in a number of those being restored. *Scotia* sailed into Aberdeen in the early hours of 25 April, on completion of the hydrographic sampling. Overall, 38 hydrographic stations were occupied (with 101 salinity, 140 chlorophyll, 123 nutrient and 44 dissolved oxygen samples, in addition to Long Term Storage samples), all mooring work (except the Moray Firth re-deployment) was successfully completed, the relevant calibration casts were completed, the VMADCP was run along the hydrographic sections and the TSG was run throughout the survey.

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

Mooring Positions (Deployment)

NWSE – 60° 16.29' N 004° 20.76' 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° 10.99' N 002° 24.92' W on NOL

Submitted:
A Gallego
01 May 2019

ALTERECO Line

#	Name	Latitude	Longitude	Depth [m]
01	AlterEco1	57° 00.00' N	02° 04.00' E	92
02	AlterEco2	57° 00.00' N	01° 48.00' E	94
03	AlterEco3	57° 00.00' N	01° 36.00' E	99
05	AlterEco5	57° 00.00' N	01° 08.00' E	85
07	AlterEco7	57° 00.00' N	00° 40.00' E	92
09	AlterEco9	57° 00.00' N	00° 14.00' E	84
11	AlterEco11	57° 00.00' N	00° 14.00' W	79
13	AlterEco13	57° 00.00' N	00° 42.00' W	68
14	AlterEco14	57° 00.00' N	00° 55.00' W	75
15	AlterEco15	57° 00.00' N	01° 08.00' W	67
16	AlterEco16	57° 00.00' N	01° 28.00' W	68
17	AlterEco17	57° 00.00' N	01° 47.00' W	98
18	AlterEco18	56° 57.80' N	02° 06.80' W	47

JONSIS Line

#	Name	Latitude	Longitude	Depth
01	JO 1	59° 17.00' N	02° 14.00' W	75 m
02	JO 1A	59° 17.00' N	02° 05.00' W	90 m
03	JO 2	59° 17.00' N	01° 56.00' W	100 m
04	JO 3	59° 17.00' N	01° 48.00' W	80 m
05	JO 4	59° 17.00' N	01° 40.00' W	90 m
06	JO 5	59° 17.00' N	01° 30.00' W	95 m
07	JO 6	59° 17.00' N	01° 20.00' W	110 m
08	JO 6A	59° 17.00' N	01° 10.00' W	120 m
09	JO 7	59° 17.00' N	01° 00.00' W	125 m
10	JO 8	59° 17.00' N	00° 40.00' W	120 m
11	JO 9	59° 17.00' N	00° 20.00' W	140 m
12	JO10	59° 17.00' N	00° 00.00' W	135 m

Nolso-Flugga (shortened)

#	Name	Latitude	Longitude	Depth
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
03	SEFN2	61° 01.40' N	01° 35.40' W	155 m
04	NOL-02	61° 04.00' N	01° 53.00' W	270 m
05	SEFN3	61° 06.00' N	02° 01.50' W	440 m
06	NOL-03	61° 08.00' N	02° 10.00' W	550 m
07	SEFN4	61° 09.30' N	02° 17.50' W	630 m
08	NOL-3a	61° 11.00' N	02° 25.00' W	730 m
09	NOL-04	61° 14.00' N	02° 40.00' W	1080 m
10	NOL-05	61° 21.00' N	03° 10.00' W	1370 m
11	NOL-06	61° 28.00' N	03° 42.00' W	1235 m