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MRV *Scotia*

Survey 1519S

PROGRAMME

14 – 24 October 2019

Loading: Aberdeen, 11 October 2019
Unloading: Aberdeen, 24 October 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: 11 days: ST05B

Gear

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

Objectives

1. Test the SBE911 and CTD carousel (main CTD crane) and the SBE25 and Aquatracker (using plankton crane) in the Buchan Deep.

2. Perform hydrographic sampling along the JONSIS long term monitoring section in the northern North Sea

3. Deploy two new ADCPs (FIGS and FIGN) in trawl-resistant seabed frames in the Fair Isle Gap

4. Recover, download and re-deploy one ADCP mooring (NWSE) at a position on Fair Isle – Munken (FIM) section

5. Deploy one new ADCP (NWER) on a single string mooring on the NOL section

6. Recover and download two ADCP moorings (NWEX and NWEZ) and redeploy one ADCP (NWEZ) on the NOL section

7. Download data from PIES mooring on NOL section and then recover the instrument

8. Perform hydrographic sampling along the long term monitoring Faroe-Shetland Channel Nolso – Flugga (NOL) section

9. Perform hydrographic sampling along the long term monitoring Faroe-Shetland

Channel Fair Isle – Munken (FIM) section

10. Take water samples for long term storage on Fair Isle – Munken or Nolso – Flugga section stations

11. Run the thermosalinograph throughout the survey

12. Run the VMADCP on all the standard sections

13. Opportunistically communicate with lost ADCP mooring on NOL section and potentially recover

14. If weather/time permits repeat the JONSIS line at the end of the survey and extend to 001°30' east (within UK waters)

15. If weather/time permits perform fine scale VMADCP/CTD survey work on the JONSIS line (around 59° 17' N, 001° 15' W)

16. If weather/time permits, perform VMADCP/CTD survey work in the Moray Firth and/or Aberdeen Bay

17. If weather/time permits, perform CTD line along the AlterECO lined

Procedure

On sailing from Aberdeen *Scotia* will make passage to the Buchan Deep to test the CTD and carousel water sampler on the main CTD crane and the SBE25+Aquatracker CTD using the plankton crane.

On completion of these tests, *Scotia* will head to the JONSIS section to carry out sampling with the CTD and carousel water sampler. On completion of the JONSIS section Scotia will make way to the Fair Isle Gap to deploy two ADCPs in trawl-resistant bed frames (during daylight hours).

Passage will then be made towards the NWSE mooring location near the Foinaven Development Area. The mooring will be recovered, serviced and re-deployed (depending on timing and weather conditions, this may be undertaken later in the survey).

Passage will then be made towards the NWER mooring location on the Nolso – Flugga (NOL) section where the ADCP mooring will be deployed. The three existing moorings on the NOL section will then be recovered and the NWEZ will be re-deployed. For the PIES mooring, communication will be established prior to recovery enabling and data will be downloaded. Depending on conditions and timing, the order of these mooring activities may change.

Scotia will then make her way to the eastern end of the Nolso – Flugga (NOL) section and start collecting long term monitoring samples and taking CTD profiles from the start of the section. On 1618S a mooring in an AL500 frame failed to surface. Communication with this lost mooring may be attempted (depending on condition/timing), but it is unlikely any communications will be established.

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. (If the NWSE mooring was not recovered earlier in the survey, we will break the line to turn this mooring around).

Once that work is completed and if time allows, *Scotia* will carry out additional work (listed

among the survey objectives) along the JONSIS line, in the Moray Firth and North Sea prior to her return to Aberdeen.

Mooring Positions (Recovery)

NWSE	60° 16.29' N	004° 20.76' W	Short single string mooring
NWEZ	61° 09.30’ N	002° 17.52’ W	Short single string mooring
NWEX	61° 11.00’ N	002° 25.00’ W	Long (63 m wire) single string mooring
PIES	61° 10.99’ N	002° 24.92’ W	PIES instrument frame on bed

Mooring Positions (Deployment)

NWSE	60° 16.29' N	004° 20.78' W	Short single string mooring
NWEZ	61° 09.30’ N	002° 17.52’ W	Short single string mooring
NWER	61° 07.00’ N	002° 05.75’ W	Short single string mooring
FIGN	59° 46.70’ N	001° 32.20’ W	AL-200 trawl-resistant bed frame
FIGS	59° 30.40’ N	002° 05.15’ W	AL-500 trawl-resistant bed frame

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-resistant frames (AL-200 and AL-500) and short single-string moorings. Longer single-string ADCP mooring deployments will be done from the trawl 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. Nutrient samples will be stored frozen in an empty freezer on the lower container deck.

(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:
R. O’Hara Murray
8 October 2019

Approved:
I. Gibb
10 October 2019

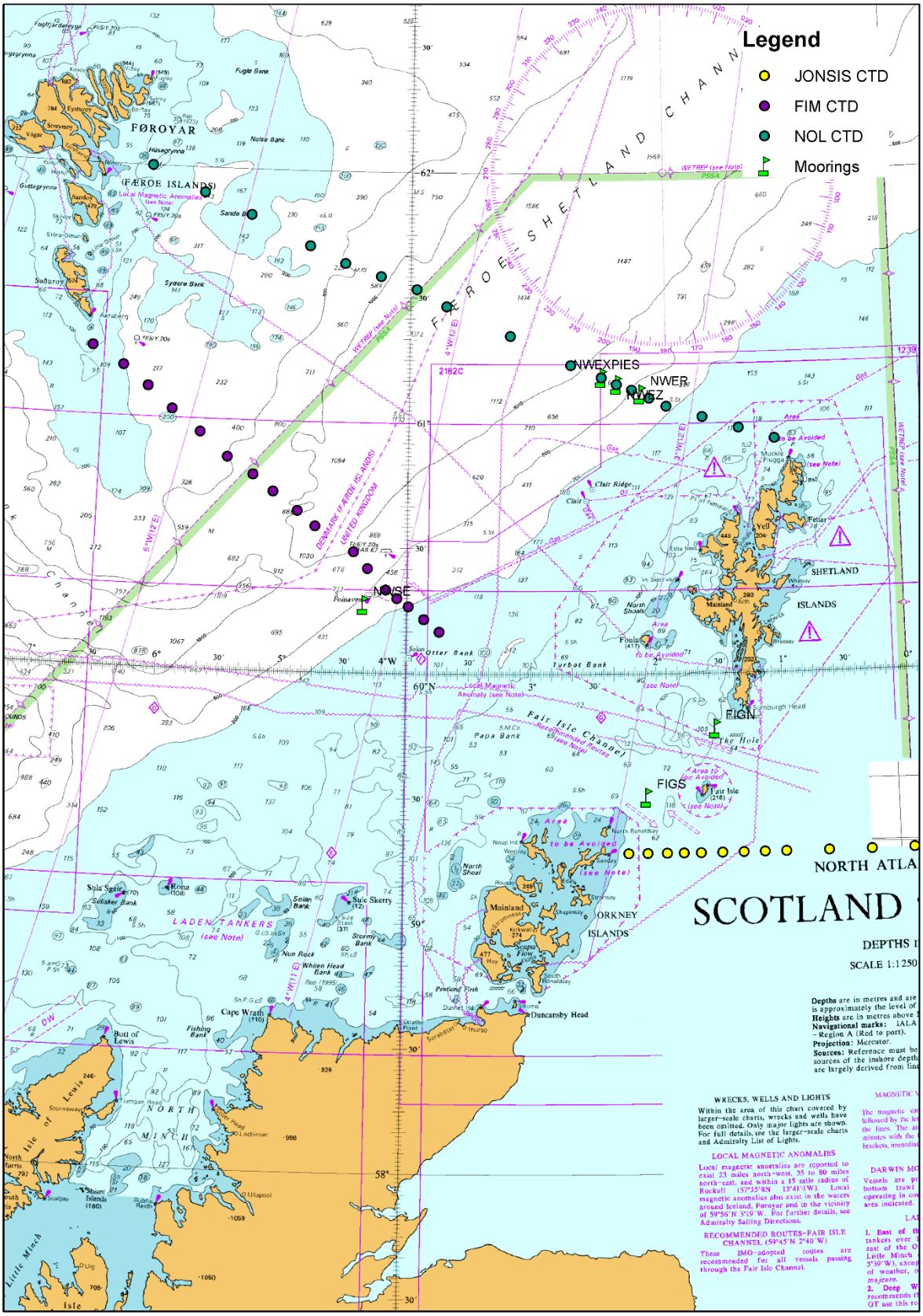

Chart showing key activities on 1519S (moorings shown with green flags)

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

Nolso-Flugga (NOL)

#	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

Fair Isle - Munken (FIM) (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*	*FIM-03*	*60° 20.00' N*	*04° 10.00' W*	*390 m*	*3.03 nm*
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