

R1/12

Not to be cited without prior reference to the Laboratory.

FRV *Scotia*

Cruise 1693S

REPORT

13-20 December 1993

Ports

Loading: Aberdeen
Unloading: Aberdeen

Personnel

W R Turrell	PSO (in charge)
A McIntosh	HSO
G Slessor	HSO
P A Gillibrand	HSO
D Campbell	SO

Objectives

1. To collect hydrographic and chemical samples along the Fair Isle - Munken (Faroe) and Nolso (Faroe) - Flugga (Shetland) standard sections.
2. To survey the standard JONSIS, East Shetland (ES) and northern North Sea (EC) sections.
3. To conduct a restricted survey of the north east coast coastal zone.
4. Collect the Aberdeen, Fair Isle radio-caesium sample for analysis by MAFF, Lowestoft.
5. To collect samples of common dab at selected locations with the GOV trawl in support of the *Braer* oil spill investigations.
6. To collect sediment samples at selected locations with the Day grab in support of the *Braer* oil spill investigations.
7. To collect live sandeel specimens for return to the Laboratory.

Out-turn Days per Project

GBG1 5
BGE1 1
BRAE 2

Narrative

FRV *Scotia* sailed from Aberdeen at 1000 Monday 13 December (all times are GMT). The Aberdeen caesium sample was taken, and she immediately proceeded to the first sample trawl position (Halibut Bank). This was completed by 1930 and *Scotia* then proceeded to the second haul position (SE Fair Isle). This haul was completed by 0230 on Tuesday 14th, when a short dredge tow was performed in order to collect live sandeels. This was only partially successful, with 10-20 sandeels collected.

Scotia then proceeded to the Fair Isle caesium position, and the sample was collected at 0621. The final trawl (W Sumburgh) was then completed at 0930. Owing to deteriorating weather it was decided that hydrographic work could not proceed, hence sediment collection using the Day grab commenced west of Shetland at 1115. After three grab samples were successfully completed, work was abandoned at 1330 owing to increasing wind strengths. *Scotia* then proceeded to St Magnus Bay to gain shelter.

Following a night of severe winds, *Scotia* left shelter at 0600 on Wednesday 15th. While on passage towards the start of the Fair Isle - Munken line it was decided that the extreme winds forecast for the Faroes area precluded the possibility of completing this section successfully. The possibility of moderate winds in the northern North Sea was evident. Hence passage was made to the start of the East Shetland ES3 line.

The ES3 line commenced at 1315 later that day. After two stations were completed *Scotia* diverted to a nearby known sandeel site. After two tows few sandeels were recovered. The ship returned to the ES3 line, which was completed by 0120 16 December. *Scotia* then proceeded to the start of the ES1 line, which commenced at 0700 that day, and was completed by 1830.

Scotia then returned to the uncompleted grab survey west of Sumburgh, which was finally finished at 2300. Passage was then made to the sandeel site north of Fair Isle. Despite repeated tows few sandeels were again recovered.

Owing to the poor weather conditions at the time, it was considered that rather than work hydrographic station, the grab stations south east of Fair Isle would be attempted. *Scotia* arrived at the site at 0730 on Friday 17 December, but weather was too poor to attempt these samples. *Scotia* then dodged to the start of the JONSIS line, along which survey work commenced at 1627. When stations JONSIS 7 was completed *Scotia* again diverted the short distance south to attempt the SE Fair Isle grab stations. These were completed by 0600 on Saturday 18 December, and the vessel returned to the JONSIS line.

However, the weather had again deteriorated and no stations could be worked. Although *Scotia* remained dodging in the area for the following six hours, no respite of the weather occurred, and none was forecast. Hence the decision was made to proceed to the comparative shelter of the southern coast of the Moray Firth, and commence coastal surveys.

Survey work along the Kinnairds Head line commenced at 0000 on Sunday 19 December, and was completed by 0340. The Macduff section was then completed by 1000, and *Scotia* proceeded to the start of the Spey Bay line. After three stations were completed along this line, wind speeds increased to in excess of 90 knots, and all work ceased. As the wind then decreased and swung towards the northwest, passage was made to the western shore

of the Moray Firth, where conditions were considered might be least bad. However, on arrival conditions were still too poor to allow hydrographic work to be performed, hence an inshore tow for sandeels was completed, followed by a tow on Smith Bank. Both resulted in the collection of a few more live sandeels. Work was completed by 2100, and passage was made to Aberdeen. *Scotia* entered harbour at 0600.

In all 48 hydrographic stations were completed during the cruise, employing Seabird CTD casts, with additional samples for full chemical analysis taken along the partly finished JONSIS section. Continuous records of near-surface temperature and salinity were recorded throughout the trip.

Results

Objectives 4, 5 and 6 were all attained during the trip. Objective 1, the survey of the Faroe-Shetland Channel, was abandoned owing to the extremely poor weather during the trip. Objectives 2 and 3 were only partly completed for the same reason.

While results from the sediment and fish sampling await laboratory analysis, on board processing of the CTD data allows some interpretation of these results:

East Shetland Hydrography: Typical winter distributions were observed, with well-mixed conditions throughout the northern North Sea. There was some indication of structure in the central northern North Sea which may merit further examination.

Northern North Sea Hydrography: The JONSIS line again revealed typical winter structure, with significant horizontal gradients marking the Fair Isle Inflow.

Moray Firth Hydrography: Stratification was evident in the inshore waters of the Moray Firth, owing to freshwater run-off from the coast. Distinct frontal features were observed in the thermosalinograph record around the Buchan Ness area.

W R Turrell

15 March 1994

Seen in draft: P Ramsay

F.R.S. SCOTIA CRUISE 16 13-20 DECEMBER 1993

