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FRV *Scotia*

Cruise 0195S

REPORT

9 - 18 January 1995

Ports

Loading: Aberdeen

Unloading: Aberdeen

Personnel

W R Turrell	PSO	(in charge)
R Payne	HSO	
G Slessor	HSO	
P A Gillibrand	HSO	
R D Adams	SO	
E Armstrong	SO	

Objectives

1. To perform hydrographic surveys along the shelf edge east, north and west of the Shetland islands.
2. To perform repeat acoustic surveys of mackerel patches in the same area.
3. To perform exploratory trawls (maximum one per day) of observed acoustic targets.
4. To recover four current meter moorings to the north and west of the Shetland Islands.

Out-turn Days per Project: EBB 10.0**Narrative**

FRV *Scotia* sailed from Aberdeen at 1100 hours on Monday 9 January, and proceeded northwards along the coast. On arriving at the Moray Firth deteriorating weather conditions were experienced, with winds increasing to 70 knots (Force 12). Hence *Scotia* returned to seek shelter off Peterhead. During the night winds in excess of 90 knots were experienced. At 0520 hours the following day *Scotia* proceeded towards the first planned CTD station at 60°30'N 01°00'E, although some engine problems were experienced. By 0100 hours on Wednesday 11 January worsening weather conditions again forced her to seek shelter in the lee of Shetland.

By 0800 hours that day a decision was made to reverse the planned programme of work, based on the predicted weather and the requirement to recover the moorings, hence *Scotia* proceeded to Sumburgh, and remained in shelter until 2300 hours on Wednesday 11, when she rounded the southerly tip of Shetland and proceeded to the first mooring location. While it was initially planned to recover the most northerly mooring first (B), the weather during the night prevented *Scotia* reaching this point, and hence passage was made to mooring A.

A CTD cast was performed adjacent to the mooring at 0805 hours on Thursday 12 January, and the mooring was recovered successfully by 1000 hours. *Scotia* then proceeded to mooring location B. On arrival there at 1300 hours no surface buoy could be located. During preparations to drag for the ground line the marker buoy above the subsurface float was sighted, and creeping operations commenced around this mark. By 1430 hours the mooring had been successfully recovered using the net drum, with little damage to the instrumentation. A CTD cast was performed at the mooring site at 1500 hours, and by 1545 hours the towed body had been deployed and the first acoustic survey commenced.

During the start of this survey the weather again deteriorated. At 1620 hours Thursday 12 January engine failure forced recovery of the acoustic towed body in poor conditions. By 1800 hours engine problems were resolved and the speed had increased sufficiently to redeploy the towed body. However at 1809 hours engine problems recurred, and the towed body was again recovered. By this time winds had increased to 45 knots (Force 9) and it was not considered safe to redeploy the towed body. Work was abandoned until 0800 hours the next day. During the night *Scotia* maintained station at the start of the survey track.

Work re-commenced at 0840 hours on Friday 13 January. Poor weather conditions meant that the towed body could not be deployed, and acoustic survey work continued using the hull transducer. The planned acoustic survey could not be worked, however, owing to the poor sea state. A reduced resolution survey was attempted using northerly and easterly running lines in order to maintain the weather on the stern quarter. By 2000 hours *Scotia* had arrived at 61°N 01°W and passage was made to sheltered waters in the lee of Shetland.

At 0810 hours on Saturday 14 January work recommenced. After consultation with staff on board the FRV *Tridens* an acoustic survey was planned to the west of 01°W. At 1100 hours it was evident that the weather window predicted for Monday was no longer apparent, and that the moorings had to be recovered whenever possible. As the weather was suitable then, the first acoustic line was completed, a CTD cast performed at 1230 hours, and passage made towards the mooring. However, weather again deteriorated, and on arrival at the mooring squalls with wind speeds in excess of 50 knots (Force 10) were occurring. The acoustic survey was hence continued. By 1713 hours *Scotia* arrived at the centre of a fleet of 16 fishing vessels. While inconclusive acoustic echoes were present in the area, the weather combined with the availability of only two engines meant exploratory fishing was not possible. Hence the acoustic survey continued.

At 0100 hours on the following day, Sunday 15 January a recurrence of engine problems forced a reduction in speed. The towed body was recovered and the survey track abandoned. Passage was made towards mooring location C for first light. During the steam the most positive mackerel mark observed during the trip was located at 60°51'N 01°24'W. However, with only one engine functioning no further examination was possible. On arrival at mooring location C, *Scotia* maintained position until first light.

Work to recover mooring C commenced at 0820 hours on Sunday 15 January, and this was accomplished by 0940 hours, in increasing winds of up to 30 knots (Force 7). Passage was made to mooring D, a single point mooring. This was acoustically triggered, and in deteriorating weather and in winds in excess of 40 knots (Force 8/9), was successfully recovered by 1400 hours. *Scotia* then proceeded to the commencement of the reduced Nolso-Flugga standard section. However, by 1700 hours the weather conditions were too poor to continue work, and *Scotia* maintained position, experiencing winds of Force 12 by 2200 hours.

However, at 0400 hours the following day the wind had reduced sufficiently so as to permit CTD work to commence. The section onto the shelf was completed by 1750 hours on Monday 16 January. At this point it was necessary to cease work and make passage to Lerwick where a member of staff had to be landed in order to return to Aberdeen. With force 11 southeasterly winds predicted for the eastern Fair Isle area, it was felt that passage to Aberdeen had to commence in any case, in order to arrive in time for the programmed completion of the trip.

During the passage south on Tuesday 17 January extreme wind conditons were experienced, reaching a maximum during the early hours of Wednesday 18 January. Winds in excess of 90 knots were experienced (Force 12), ccompanied by heavy seas. At one stage a wave broke over *Scotia's* bow which resulted in damage to a spar buoy stowed there. *Scotia* eventually entered Aberdeen harbour at 1800 hours on Wednesday 18 January.

Results

- Objective 1 This objective was partly completed. The inshore portion of the Nolso-Flugga line was completed, as were three CTD casts performed during the recovery of the moorings, and during the acoustic surveys, in order to examine vertical structure in relation to the along-track surface measurements which were continually recorded. Results from the Nolso-Flugga line indicated a distinct warm (9.5°C) saline (35.33) core centred above the 200 m contour. The area of the salinity maximum appeared to extend onto the shelf to a greater extent than has been observed in other winters. Initial analysis of thew thermosalinograph data indicates a narrow zone of cooler and less saline water around the northern Shetland coast, inshore from the 100 m contour.
- Objective 2: This objective was partly completed. Two surveys of the area indicated on the chart were attempted and were partly successful. Few mackerel marks were found, despite the presence at one stage of large numbers of fishing boats. Survey 1 commenced at 0845 hours on 13 January and was completed at 2025 hours on 13 January. Survey 2 commenced at 0920 hours on 14 January and was completed at 0020 hours on 15 January.
- Objective 3: Owing to the poor weather and engine problems no trawls were achieved.
- Objective 4: Despite at times severe conditions all four moorings were successfully recovered. Initial analysis indicates almost 100% valid data.

W R Turrell
2 February 1995

Seen in draft: P Ramsay

Scotia Cruise 0195S

