

Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHARLES DARWIN

Cruise 10B / 86

8-26 March 1986

R.R.S. CHARLES DARWIN, Cruise 10B

Duration of cruise: 0902h 8 March - 0800h 26 March 1986

All times GMT

Locality: Faroe-Shetland Channel, Faroe Bank, Scottish continental shelf. North Channel & Firth of Clyde.

Staff:

D.J. Ellett	(10-24 March)
R. Bowers	(10-24 March)
D.T. Meldrum	(10-24 March)
Dr J.M. Graham	(10-24 March)
C.R. Griffiths	(10-24 March)
N. MacDougall	(10-24 March)
R. Payne (DAFS, Aberdeen)	(10-24 March)
J. Loynes (IOS, Wormley)	
S. Benn (NCC, Aberdeen)	(10-24 March)
I. Innes (RVS, Barry)	
R. Phipps (RVS, Barry)	
M. Davies (RVS, Barry)	
J. Wynar (RVS, Barry)	

- Aims:
- 1) To work the Fair Isle-Munken Rock CTD section across the Faroe-Shetland Channel.
 - 2) To work CTD sections radiating from Faroe Bank and across the Wyville-Thomson Ridge overflow channels.
 - 3) To collect silicate samples at a selection of stations and depths in the Faroe-Shetland Channel and northern Rockall Channel.
 - 4) To deploy an IOS mooring in the Faroe Bank Channel.
 - 5) To work the Anton Dohrn Seamount CTD section and recover MBA mooring B from the southwest flank of the seamount.
 - 6) To collect radioisotope samples and CTD profiles at standard positions between the shelf-edge and the Sound of Mull, west of Islay, in the North Channel and across the Firth Clyde entrance.
 - 7) To service moorings Y (Tiree Passage) and C5 (off Campbeltown) and inspect SMBA/DAFS moorings C1-4 and C6.
 - 8) To make seabird counts to the north and west of Scotland for the NCC Seabird Unit.

Narrative: CHARLES DARWIN sailed from Shoreham at 0902h 8 March and voyaged up the East Coast in calm weather with fog patches to reach Dundee at 1605h 10 March. After embarking gear and staff, the ship sailed at 2304h. The first station of the Fair Isle-Munken Rock CTD section was begun at 1800h 11 March, the southerly wind having freshened to force 7 during the day. A loose turn in the CTD wire was caught in the winch cheeks at the third station at 2305h and the ship was laid until 0215h 12 March to make repairs. Water-bottle samples were taken for silicate determination at station FM6, and as the changeover from CTD cable to hydrowire required 1½ hours to effect, opportunity was taken to test an acoustic release for the IOS mooring upon the hydrowire at this station. Winds rose again from forces 6-7 during the day to force 8 during the evening, and upon the completion of station FM8 at 2328h it was decided to seek shelter around the Faroes.

The ship remained hove-to off the northern coast of Faroe during 13-15 March, during which time the southerly winds were rarely below force 8 in the lee of the land, and attained force 11 at times. Following an improvement during the early hours of 16 March the ship left Mykines at 0800h and set course for the central sill of the Faroe Bank Channel, where the IOS mooring was laid between 1242h and 1442h. A CTD section from Sutheroy across the Faroe Bank Channel to the northeast quadrant of Faroe Bank was begun at 1814h and completed on the bank crest at 0856h 17 March. Overnight winds had exceeded force 8 in squalls, and during the working of a CTD section southwards across the bank became more steadily force 8 to 9. Two stations were omitted from the section, and work ceased over the southern slope of the bank at 1736h with the ship hove-to on southwesterly courses.

Little southward progress was made overnight in head seas resulting from forces 10 to 11 winds, but with some moderation to force 8 it was possible to make passage southeastward to the Butt of Lewis, which was rounded at 1834h 18 March. CHARLES DARWIN passed down the Minches during the night and rounded Barra Head at 0510h 19 March. Winds had dropped to force 6, but a heavy swell slowed progress towards Anton Dohrn Seamount. Easier conditions off the shelf allowed the position of SMBA mooring B to be reached at 1530h and all equipment was recovered by 1736h. Plans to work part of the Anton Dohrn Seamount CTD section were defeated by the return of southeast winds of forces 8 to 11, and the ship returned along the line of the section, surface sampling en route. The winds veered to west, reaching 75 kt on the morning of 20 March. Surface radiocaesium samples were collected at the longitudes of the standard stations west of the Hebrides, but a few miles to the southward in latitude. Barra Head was reached at 1430h, and the ship sheltered off Barra and the Uists during the continuing force 8 and 9 westerlies of the afternoon and night.

At 0818h 21 March course was set for the radiocaesium stations between Barra and the Sound of Mull, and these were sampled at the surface between 1026 and 1357h. In the afternoon, the westerly direction of the force 6-7 winds allowed mooring Y, in the Tires Passage, to be raised at high water between 1455h and 1607h. Intercomparisons of the three CTD units were made in deep water in the lee of Coll during the rigging of a replacement mooring and this was laid at 1935h to 2008h. Course was set for CTD section D, west of Islay, but swell and force 8-9 winds from a further depression forced a change of plan, and at 0945h 22 March the ship began recovery of mooring C5 off Campbeltown. This was complete by 1049h, and after servicing, a replacement was deployed at 1306h to 1324h. During a temporary lull of wind to force 6, CTD sections Y and Z, from Sanda to Corsewall and Portpatrick to Copeland were worked at 1450h to 2325h, and section A from Antrim to Kintyre was completed between 0234h and 0540h 23 March during the return of force 8-10 westerlies.

CTD stations of the Firth of Clyde grid were worked in the lee of the Kintyre peninsula, and moderation of the winds to force 7 in the evening allowed stations east of Arran to be completed. This group of stations was initially worked using the Neil Brown 'Smart' CTD (stations AB37-48), but completed with the Bissett-Berman instrument when the former was found to have leaked. The six SMBA and DAFS current meter moorings across the sill of the firth were inspected in the course of working CTD stations during the morning of 24 March and found to be on position and in good order. Work ceased at 0930h, when course was set for Campbeltown, where the ship berthed at 1215h to discharge SMBA staff and gear, sailing for Barry at 1500h. Return to Barry by 0800h 26 March, a day earlier than anticipated at the start of the cruise, had been requested on 19 March by RVS. Winds during the period of the cruise between Dundee and Campbeltown had exceeded force 7 for 43% of the time, and exceeded force 8 for 18%.

Results:

Aim 1) Eleven CTD stations were worked upon the Aberdeen Fair Isle to Munken Rock section during 11-12 March. Although strong winds forced abandonment at position FM8, only the upper part of the Faroe slope remained unsampled. Silicate samples were taken at the deepest station, but the difficulties in changing between CTD and hydrowire winch barrels made it impractical to work such stations on a regular basis.

Aim 2) Loss of time from bad weather permitted only the working of sections from northeast and south on to the crest of Faroe Bank during 16-17 March. These show denser water upon the crest of the bank (Figure 2) and provide complementary data for the two SMBA satellite-tracked drogues released upon the bank by the Fiskerannsóknaarstovan on 10 March, and for the ICS Faroe Bank Channel mooring.

Aim 3) As noted under Aim 1, collection of silicate samples proved to be time-consuming and was effected at the deepest station of the Fair-Isle-Munken Rock section and thereafter from the CTD calibration bottle at the deeper stations of the sections crossing Faroe Bank. Preparations to make serial observations in Wyville-Thomson Ridge overflow water south of Faroe Bank were defeated by the abandonment of work due to weather.

Aim 4) An ICS current meter mooring carrying two Aanderaa meters at 20m and 30m above the bottom was deployed on 16 March in depths of 750m in the centre of the Faroe Bank Channel.

mooring no 408

Aim 5) Mooring B, laid in 1390m on the southeast flank of Anton Dohrn Seamount on 20 August 1985 was recovered during a brief weather window on 19 March. The three Aanderaa current meters had apparently functioned correctly during the seven-month deployment.

Returning high winds, exceeding force 10 by midnight 19 March made CTD work on the Anton Dohrn Seamount section impossible, and only surface sampling was carried out on the return eastwards towards the shelf-edge.

Aim 6) Between the shelf-edge and Mull only surface sampling was possible for radiocaesium and salinity. The winch barrel changeover problem would have ruled out large volume sub-surface sampling in any case, even had the weather permitted. Conditions were not suitable for work on the section west of Islay.

In the North Channel CTD sections Y (Corsewall-Sanda), Z (Copeland-Portpatrick) and A (Antrim-Kintyre) were worked during 22-23 March with surface radiocaesium sampling, and during 23-24 March 32 CTD stations of the Firth of Clyde grid were completed before the available time expired.

Aim 7) Mooring Y in the Tiree Passage was recovered and redeployed on 21 March and mooring C5 in the Firth of Clyde on 22 March. SMBA moorings C4 and C6 and DAFS moorings C1-3 were inspected and appeared in good order.

Aim 8) Mr Benn made seabird counts throughout the cruise during most daylight hours for the NCC Seabird Unit.

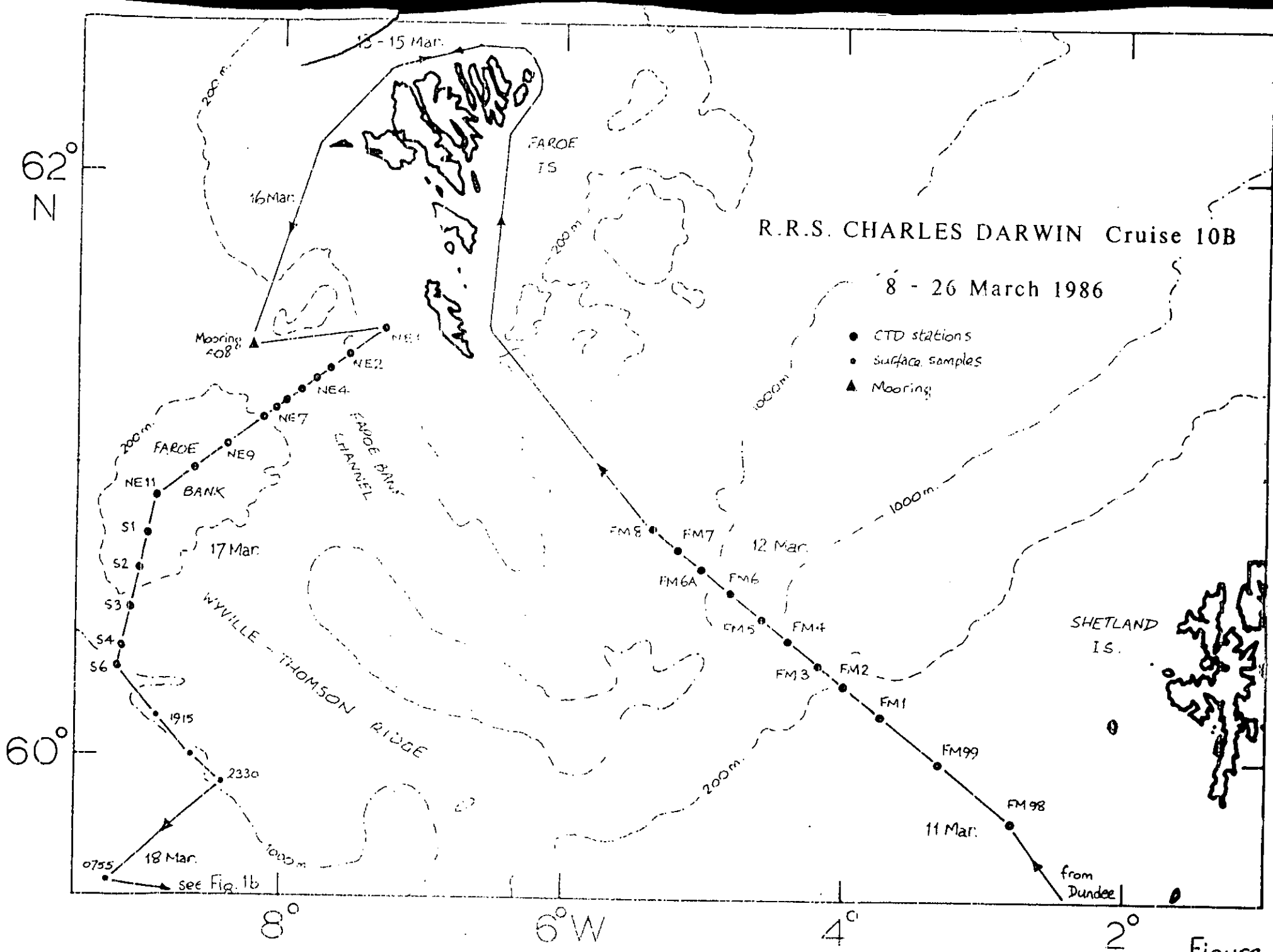


Figure 1a

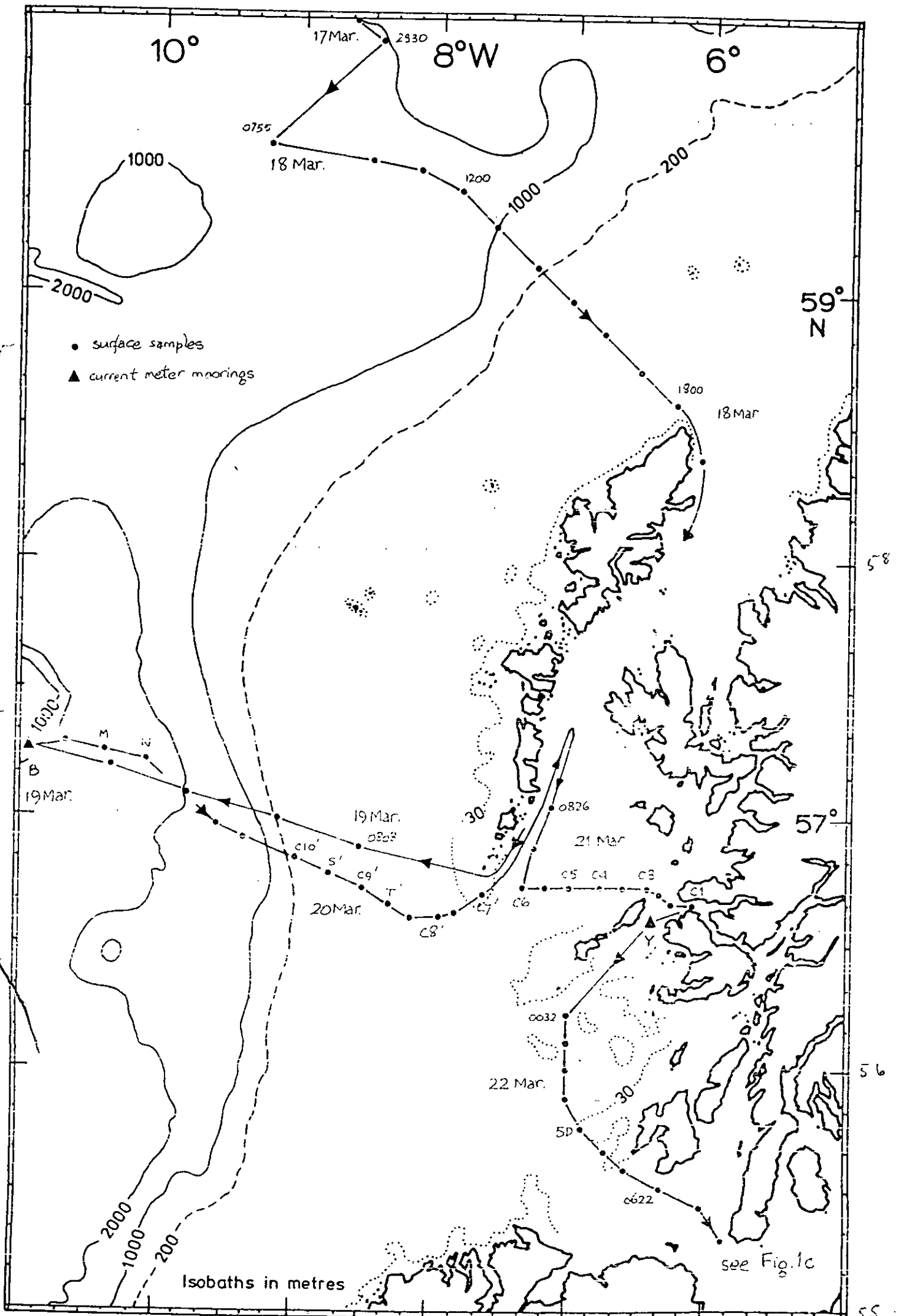


Figure 1b

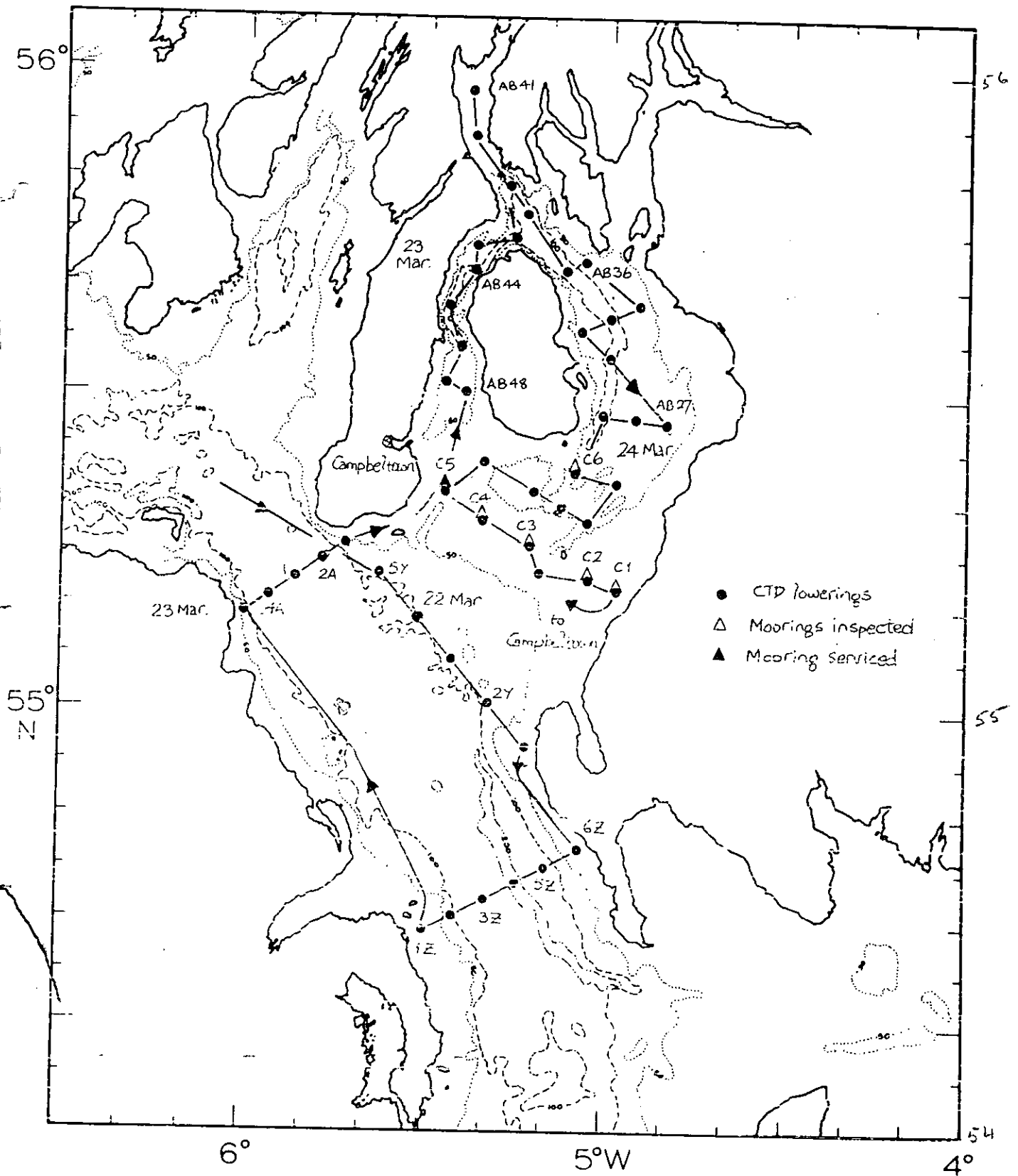


Figure 1c

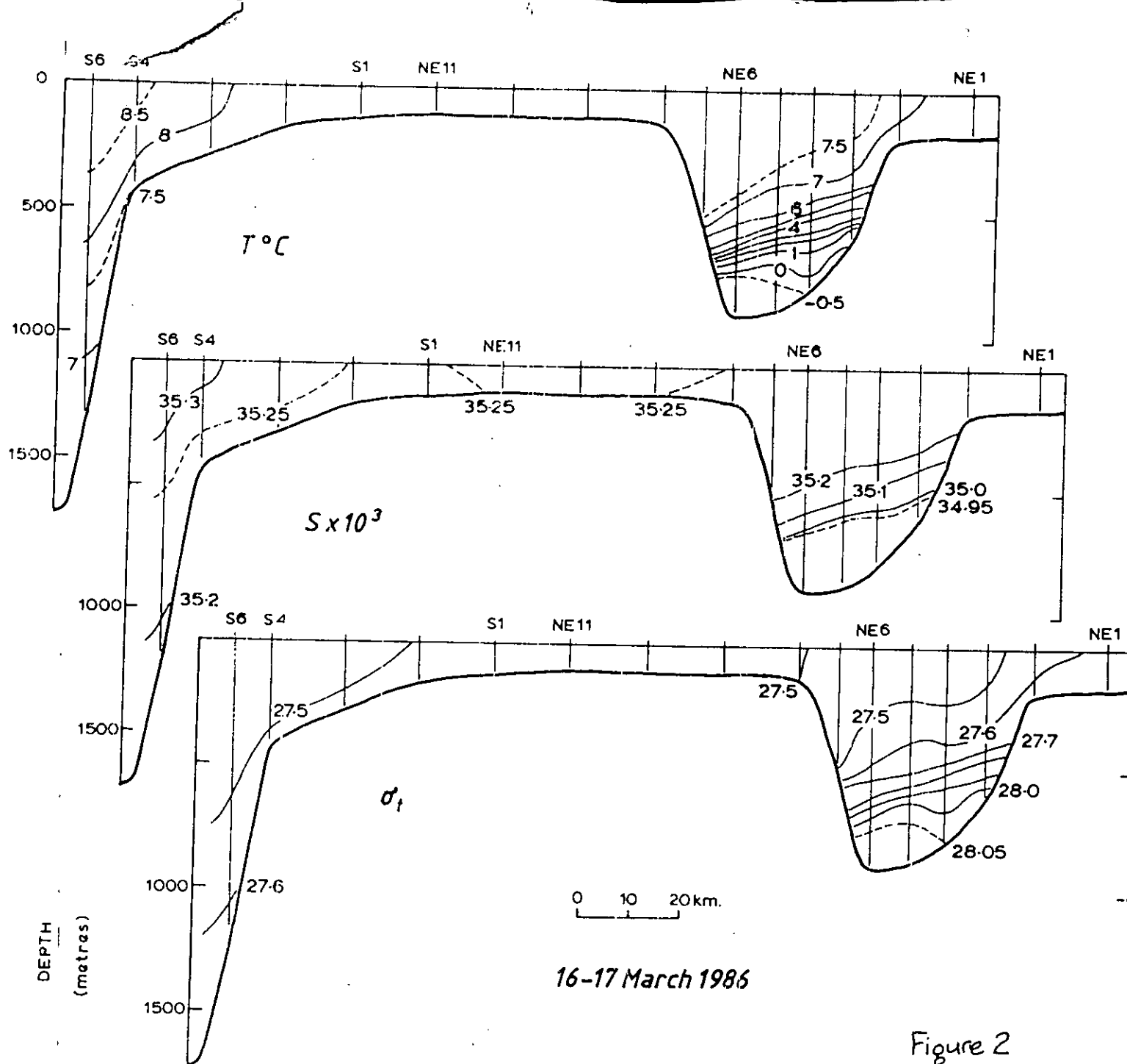


Figure 2