Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

CRUISE REPORT

R.R.S. CHALLENGER

S.M.B.A., P.O. Box No. 3, Oban, Argyll, Scotland.

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Cruise Report

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Cruise 2/1981

26 January - 4 February 1981

R.R.S. CHALLENGER, Cruise 2/1981

Duration of cruise: 1038 h 26 January - 0638 h 4 February 1981.

All times GMT.

Locality: Rockall Channel and Scottish continental shelf.

Staff:

D.J. Ellett
R. Bowers
A. Edwards
D.J. Edelsten
N.D. Pascoe
Mrs. C. Petre
G. Keane (Ocean Services Dept., IIRS, Eire).

Aims:

(1) To service SMBA current meter moorings R (57°N, 9°W) and M ($57^{\circ}18'$N, $10^{\circ}23'$W) and to re-lay mooring F ($57^{\circ}30'$N, $12^{\circ}15'$W).

(2) To work the Anton Dohrn Seamount CTD section and other sections across the Rockall Channel as time permits.

(3) To moor a corrosion potential monitoring current meter off the West coast of S. Uist.

(4) To collect 50 litre water samples for radiocaesium analysis and CTD profiles at standard positions between the Sound of Mull and the shelf-edge.

Narrative:

CHALLENGER anchored off Dunstaffnage at 1038 h 26 January after passage from South Shields. Staff and gear were embarked aboard CALANUS from Oban North Pier in two loads between 1100 h and 1700 h. Failure of one boiler

fan necessitated the raising of steam in the second boiler, and after consultation with RVS Barry it was decided to land the defective electric motor via SEOL MARA and await the arrival of a replacement on the following morning. This was aboard at 0825 h 27 January, and when installed the ship weighed anchor at 1107 h. Passage was made through the Sound of Mull and the first radiocaesium sample was collected at 1439 h. Sampling was continued westwards with CTD lowerings from the second station to station C8, west of Barra Head, which was completed at 0353 h 28 January. Winds were southerly, forces 5-6, as the ship headed for the wave energy test site off S. Uist to lay the corrosion potential monitoring current meter (CPCM). Between 0830 and 1122 h an echo-sounding survey was made in order to select a suitable mooring site, and in the upshot this was chosen as the vicinity of the SMBA toroid for fouling studies. The CPCM was deployed from a normal shelf mooring with sub-surface buoy and spar marker between 1143 and 1201 h. Following this, a possible position from side-scan sonar surveys for the previous single-strand CPCM mooring was investigated, but no reply was received from 40 minutes of acoustic interrogation and the ship set course at 1330 h for a shelf CTD section.

From 1533 h to 0103 h 29 January six shelf CTD stations were worked at standard positions westwards from S. Uist. Southerly winds had increased during the afternoon of 28th and had become south-westerly forces 7-9 by 1012 h 29th when radiocaesium station C9 was worked. CHALLENGER proceeded at reduced speed to mooring R, at the shelf edge, but winds had moderated to forces 4-5 when the mooring was reached and recovery was made between 1621 and 1700 h. Re-laying was postponed

to the following morning for daylight and to allow the swell to moderate, and after preparing the new mooring five CTD stations (R to O′) were worked between 2113 h and 0308 h 30 January. After steaming back to R, the mooring was laid between 0829 and 0904 h.

With further strong winds forecast, it was decided to make for mooring M to attempt recovery before nightfall. The acoustic release was contacted at 1530 h and released at 1559 h. Recovery of the sub-surface buoy and four current meters occupied from 1624 to 1724 h. After a short steam to dump the used wires, the CTD section was re-commenced at station O at 2107 h. Stations O, N and M were worked in increasing south-westerly force 7-8 winds, but at 0400 h 31 January problems with the ship's reduction gearbox compelled a return eastwards at reduced speed.

As a result of discussions with RVS, it was agreed that the ship should return to Barry for attention to the gearbox. Progress was slow due to the need for reduced speed and was further impaired by strong south-westerly gales in the Irish Sea on 2 February. At 1445 h 3 February CHALLENGER anchored off Milford Haven to take aboard two engineers from the gearbox manufacturers, departing at 1517 h. Barry was reached the following morning, the ship berthing at 0638 h 4 February.

Results:

Aim (1) Mooring R (57°N, 9°W) was serviced on 29-30 January. The previous deployment was on 9 October 1980 and the two Aanderaa current meters, at nominal depths of 40 and 110 m, appear to have functioned correctly during their 114 days in the sea. The buoy wire had bird-caged and its outer cables were partly stranded due to tangling

at its junction with the pick-up line, but the mooring had otherwise withstood a particularly stormy winter very well. The mooring was re-laid for servicing in April.

Mooring M ($57^{\circ}17'N$, $10^{\circ}19'W$) was raised on 30 January, after a deployment of 112 days from 10 October 1980. The four Aanderaa meters were at nominal depths of 100, 500, 1000 and 1750 m and appear to have operated correctly. The intention to re-lay this mooring on the following day was not carried out due to the ship's need to return to port, and this early end to scientific work also prevented mooring F from being laid.

Aim (2) Stations M to R of the Anton Dohrn Seamount CTD section were worked on 29-31 January, with two additional stations, O′ and P′, inserted over the continental slope. Although circumstances prevented the completion of the section, this January transect of the slope region will be of value in studies of the slope current. Deep winter mixing was most clearly seen over the slope region, although only Q (in 297 m) and P′ (in 618 m) showed the virtually homothermal traces commonly observed later in the winter. Taking as an index for the deeper stations the depth at which temperatures were 0.25 deg. C below those of the surface, at N (in 2095 m depth) this was only 400 m, whereas at P (in 1400 m depth) it was 700 m.

Aim (3) The CPCM mooring was laid on 28 January immediately to the south of the SMBA toroid. The current meter was at a nominal depth of 26 m in soundings of 46 m.

Aim (4) 50 litre water samples for radiocaesium analysis by the Fisheries Radiobiological Laboratory were collected at ten standard positions between Tobermory and the shelf-edge mooring during

27-29 January. CTD lowerings were made at all except the first position. Lowest surface temperatures, 7.4° - 7.8°C, were found in the coastal water of the Tiree Passage, and bottom temperatures were warmer than those of the surface within the Sea of the Hebrides by as much as 0.75 deg. C.

Miscellaneous

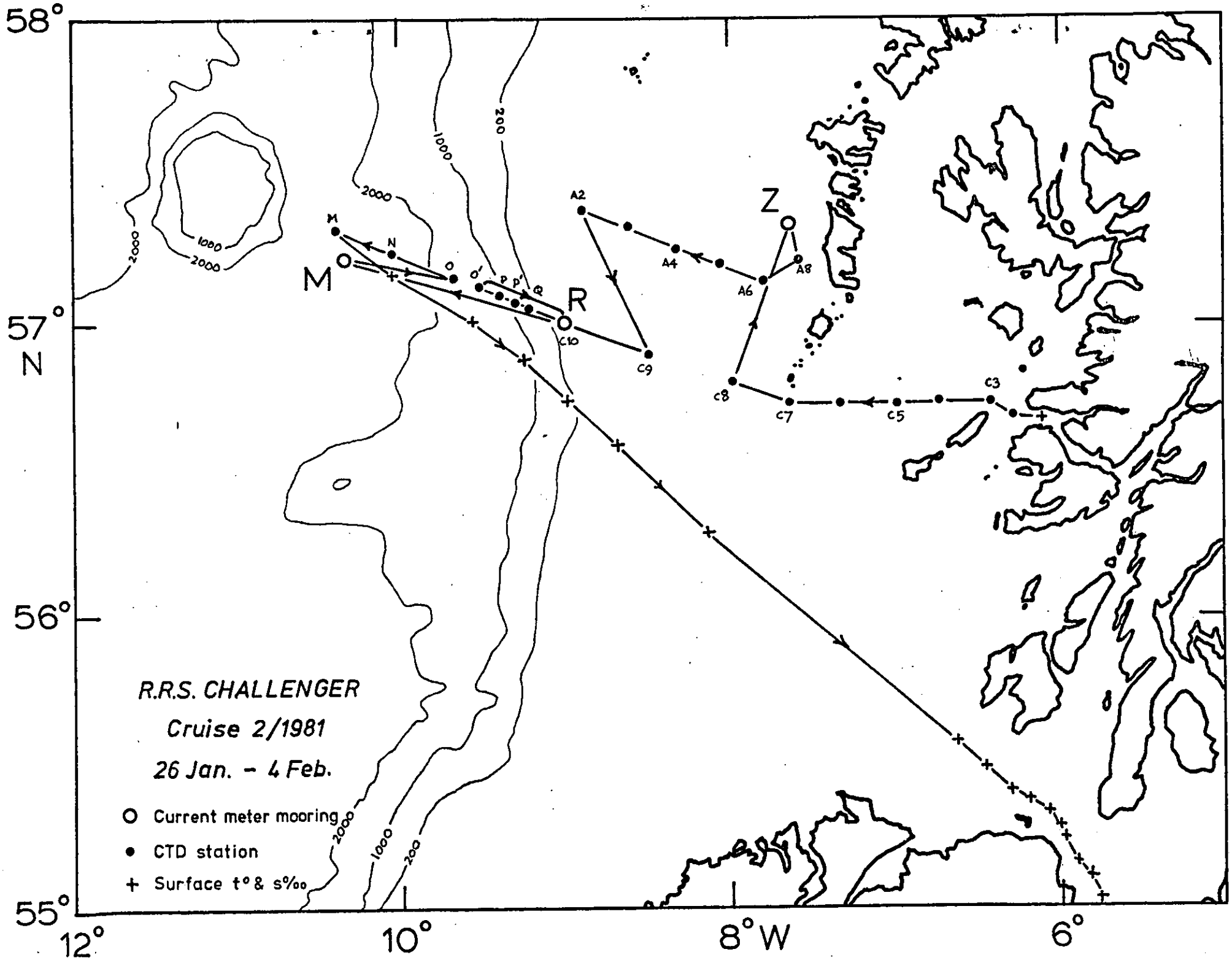
(a) Six stations of a CTD section worked on the shelf to the west of the Uists on several occasions during 1980 were sampled on 28-29 January. Close to the coast of S. Uist temperature was low (7.6°C) and the water-column homothermal, but at four or five offshore stations bottom temperatures were slightly colder than those at the surface, a reversal of the pattern in the Sea of the Hebrides.

(b) Soundings and 10-minute position fixes were taken between moorings R and M on 30 January to provide an accurate profile of the continental slope zone.

(c) Surface salinity samples and CTD bucket temperatures were taken across the slope zone on the inward passage on 31 January and across the North Channel from the Rhinns of Islay to Skulmartin on 1 February.

D.J. Ellett

6 February 1981.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C8
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R.R.S. CHALLENGER
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Current meter mooring
CTD station
Surface t° & s‰