

SCOTTISH MARINE BIOLOGICAL ASSOCIATION

Dunstaffnage Marine Research Laboratory

CRUISE REPORT

R.R.S. CHALLENGER.

Cruise 14B/1978

4 - 11 November, 1978.

R.R.S. CHALLENGER, Cruise 14B/1978

Duration of Cruise: 1223 h 4 November - 0927 h 11 November 1978.

All times G.M.T.

Locality: Rockall Channel and Scottish continental shelf.

Staff:

- D.J. Ellett
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- Aims:
- a) Hydrographic
 - 1) To service the SMBA current mooring in 57°N , 9°W .
 - 2) To retrieve the deep SMBA mooring in the vicinity of $57^{\circ}18'\text{N}$, $10^{\circ}23'\text{W}$.
 - 3) To work the Anton Dohrn Seamount STD section and stations on the Scottish continental shelf.
 - 4) To collect 50 litre water samples at standard positions for radiocaesium analysis.
 - 5) To make an STD section across the benthos sampling site to the continental shelf.
 - b) Benthic
 - 6) To obtain epibenthic sled samples of the

Aims
(Cont'd):

- abyssal macrobenthos at the SMBA permanent station in 54°40'N, 12°16'W at 2900 m depth.
- 7) To obtain box cores at the permanent station if sea conditions permit.
 - 8) To obtain near-surface and deep hauls of plankton at the permanent station with the rectangular mid-water trawl.
 - 9) To obtain Agassiz trawl hauls between Anton Dohrn Seamount and the St. Kilda continental slope.

Narrative: Staff embarked from CALANUS off Dunstaffnage at 1035 h 4 November, and CHALLENGER weighed anchor at 1223 h. After passage through the Sound of Mull, surface sampling for radiocaesium began off Ardmore Point at 1526 h, and salinity-temperature-depth (STD) profiles were additionally taken at stations C2 to C7 between the Tirez Passage and Barra Head. The south-westerly winds varied between forces 7 and 8 during the day, and with increasing swell to the westward it was decided to shelter off Lochboisdale overnight after completing station C7 at 0145 h 5 November. The shelf current meter rig was prepared for launching during the following morning and with some decrease in the winds to force 6-7, southerly, course was set at 1720 h for Barra Head. Station C8 was begun at 0025 h 6 November and stations continued westwards to the current meter mooring site. A replacement mooring was laid between 0904 and 0939 h

Narrative
(Cont'd):

and the previous mooring retrieved between 1020 and 1052 h. Winds had increased to force 8 and after collecting the final radiocaesium surface sample the ship hove-to to await an improvement.

Winds decreased to force 7 during the evening of 6 November, and at 2312 h course was set for the deep mooring position at station M of the Anton Dohrn Seamount section. At 0900 h 7 November an acoustic search for the mooring was begun in force 8 winds, and contact was made with the release at 0933 h. At 0952 h the release was fired and the sub-surface buoy was grappled at 1012 h. The four current meters and acoustic release were retrieved by 1118 h and as STD work was not possible, it was decided to steam towards the western part of the section in the hope of working eastward during a forecast lull during the passage of a col between depressions. However, the passage of a cold front brought a rapid shift of wind to the north-west, and at 1950 h CHALLENGER turned eastwards, surface sampling at stations G to I. Towards midnight the wind had decreased to force 6 and STD lowerings were begun at 2315 h at station J, above the crest of the seamount. Winds again became south-westerly, forces 7 and 8 during the morning of 8 November and after completing station N, it was decided to save time in worsening conditions by sampling stations O and Q

Narrative
(Cont'd):

at the surface only, in order to maintain time-series of profiles at stations P and R.

Observations at station R were completed at 1509 h 8 November in force 8 winds and a heavy swell. As a further deterioration of weather was expected, and as dwindling fuel supplies dictated a need to leave the area within 18 hours, it was agreed to proceed via the Minches to the Tyne. Barra Head was rounded at 2154 h and the passage through the Minches made during the morning of 9 November with a force 8-9 following wind. Conditions improved during 10 November and the ship berthed for refit at the Middle Docks, South Shields at 0927 h 11 November.

Results: Aim 1): The SMBA shelf current meter mooring in 57°N , 9°W was serviced on 6 November. The meters recovered appeared to have functioned correctly during the previous 88 days, having been laid on 10 August. The replacement mooring carried two meters at the same nominal depths of 39 and 109 m and all were fitted with thermistors.

Aim 2): The deep mooring in the vicinity of station M was recovered on 7 November. Despite gale conditions, recovery was straight-forward, and the four current meters, at nominal depths of 89, 500, 1000 and 1750 m in soundings of 2270 m, appeared to have functioned correctly. All were fitted with thermistors and the upper three carried

Results
(Cont'd)

pressure sensors. Due to long delivery dates, wires for a replacement station were not available, but it is planned to re-lay the deep moorings at stations F and M in January 1979.

Aim 3): The western portion of the Anton Dohrn Seamount section was worked using the Liverpool University 9006 STD during 7-8 November. Lowerings were made at stations J to R, with the exception of stations O and Q, which were omitted in order to complete the section in worsening weather. This was first transit of the section during the month of November. Over the deep water, salinity in an upper layer 60 to 100 m thick were from 35.26 to 35.29⁰/oo. Beneath this layer a marked discontinuity occurred with salinities rising by 0.08 - 0.12⁰/oo, the maximum value, 35.40⁰/oo, being obtained at station M (Figures 2 and 3). Water of this salinity has not been observed in the central Rockall Channel for a number of years.

Poor weather prevented the working of shelf sections other than that between Barra Head and the shelf-edge taken in conjunction with the radiocaesium sampling on 5-6 November.

Aim 4): 50 Litre surface samples for radiocaesium analysis by the Fisheries Radiobiological Laboratory were collected at the ten standard sampling positions between the Sound of Mull and 9⁰W on 4-6 November. STD lowerings were made at all stations except the first.

Results
(Cont'd)

Aims 6 to 9): The mean wind speed during the five days available for working outside the Hebrides (i.e., 5-9 November), was 31 kt, with only brief periods when the wind fell to force 6. Taken with the need to service the moorings before tapes and batteries expired, this gave no opportunity for Agassiz trawling in the northern Rockall Channel (Aim 9). The unusually rapid consumption of fuel meant that CHALLENGER had to leave the Hebrides area during 9 November, ruling out any benthos work in the latitude of Porcupine Bank.. (Aims 6 to 8).

D.J. Ellett.

11 November 1978.

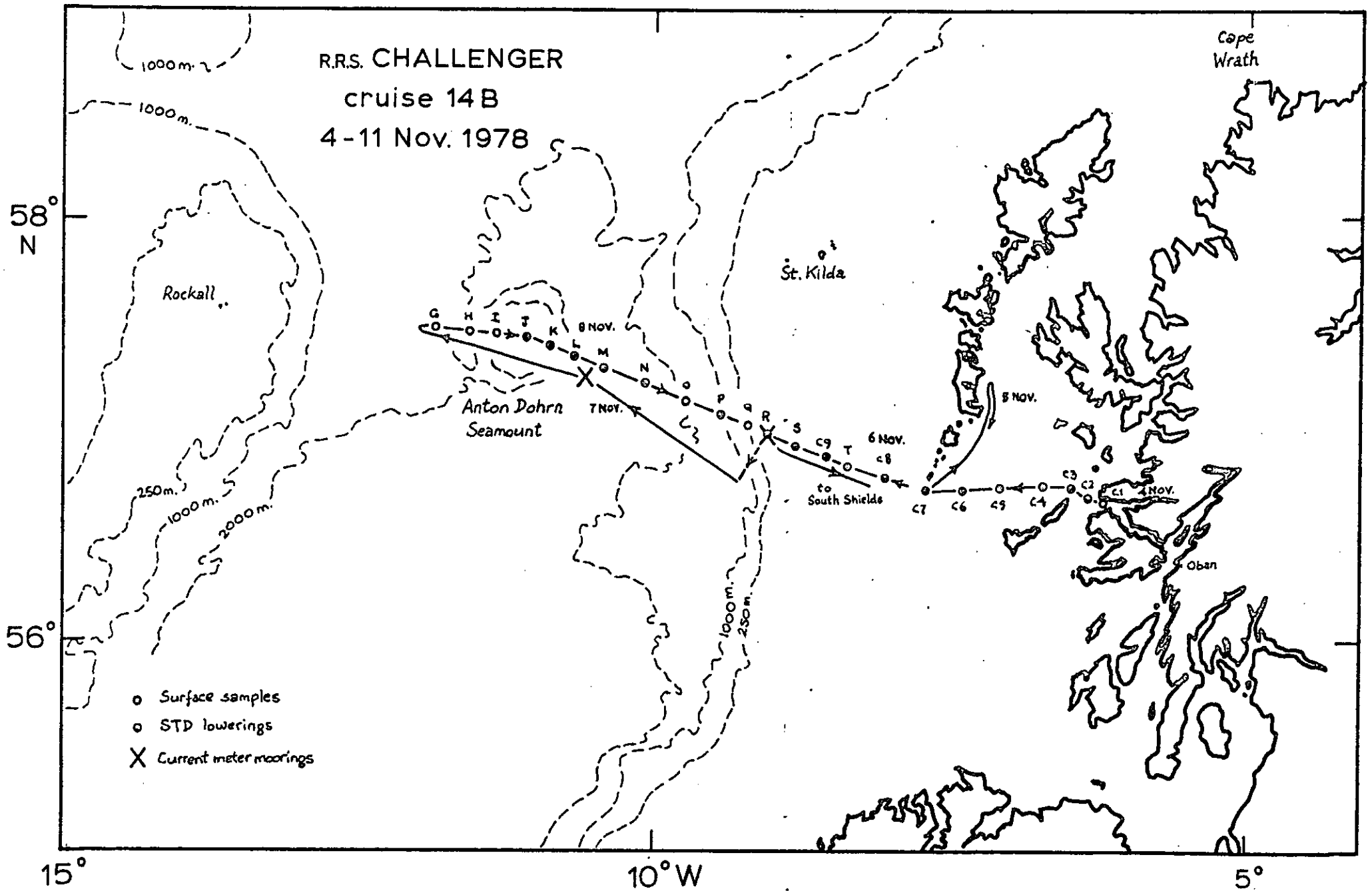


Figure 1

Figure 2. Temperature and salinity profiles at station M (57°18'N 10°23'W),
8 November 1978.

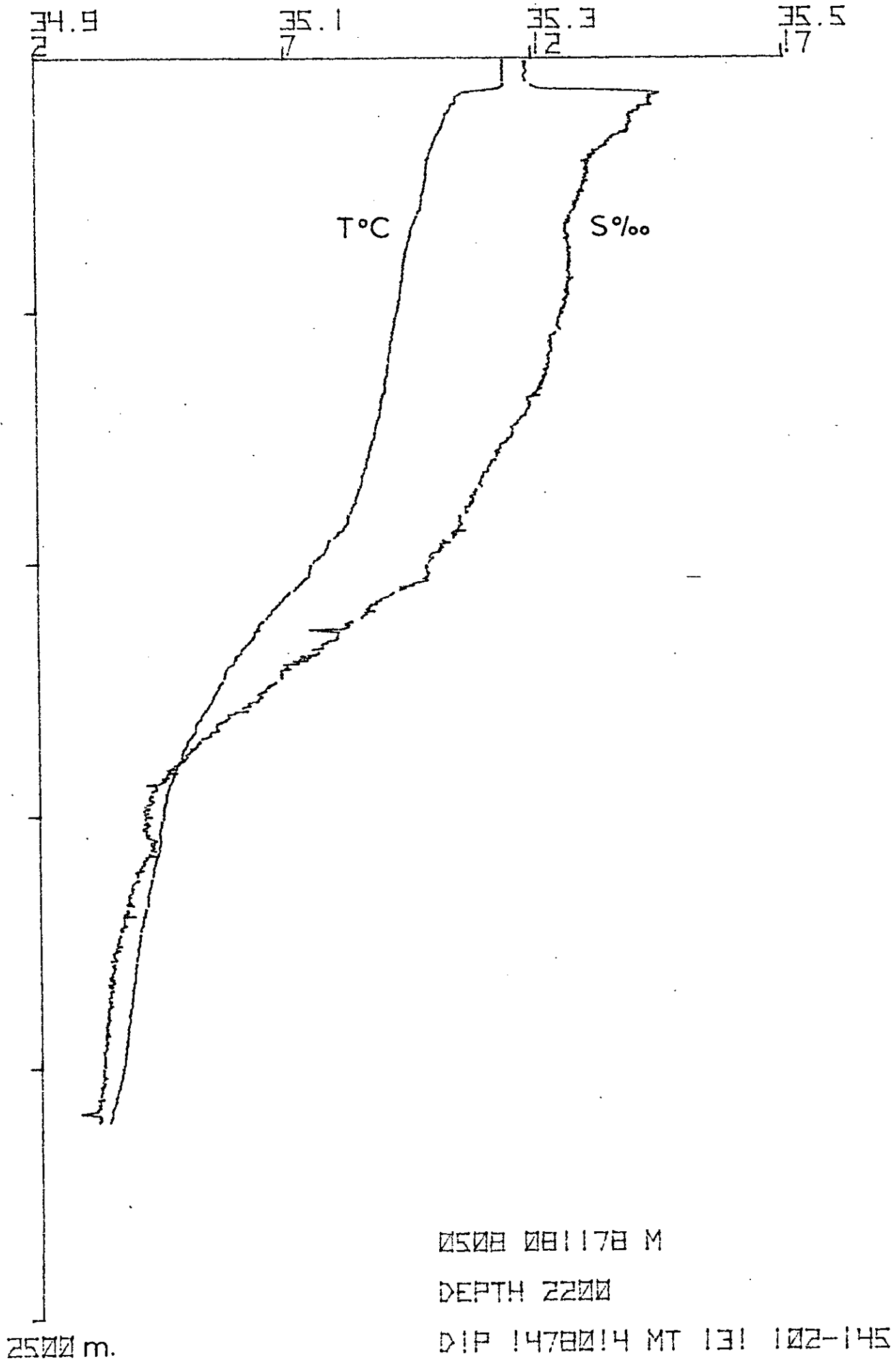


Figure 3. Shipboard temperature-salinity plot for station M, 8 November 1978.

