SCOTTISH MARINE BIOLOGICAL ASSOCIATION

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHALLENGER

Cruise 4/1980

26 February - 7 March 1980.

R.R.S. CHALLENGER, Cruise 4/1980

Duration of Cruise: 26 February - 7 March 1980.

Locality: Rockall Channel and Scottish Continental Shelf.

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Aims: a) Hydrographic

1) To deploy the SMBA shelf current meter mooring at Station R (57 00N 09 00W) and the deep moorings at Stations F (57 30N 12 16W) and M (57 13N 10 22W).

2) To work the SMBA Anton Dohrn Seamount CTD section.

3) To work CTD sections in the northern Rockall Channel as time permits.

4) To collect 50 litre water samples and CTD profiles at standard positions for radio-caesium analysis.

b) Benthic

5) To obtain epibenthic sled samples of the abysall macrobenthos at the SMBA permanent station in 54 40 N 12 16W at 2900 m depth.

6) To obtain deep plankton hauls at the permanent station with the rectangular mid-water trawl.

7) To operate the Agassiz trawl between Anton Dohrn Seamount and the St. Kilda continental slope.

Narrative: SMBA gear was loaded on to CHALLENGER at Barry during the morning of 25 February, all staff arriving on board by that evening in readiness for sailing at midday on 26 February. Fine anticyclonic weather and full power engine trials allowed rapid progress to be made south of Ireland, Mizen Head being rounded in the mid-afternoon of 27 February. 500 m of rusty CTD cable was cropped and mooring F wound on to the auxiliary winches prior to deploying the epibenthic sled at the SMBA permanent benthic station at 1400 h on 28 February, a small but rich haul being recovered at 1700 h. Two acoustic releases were successfully tested at 2000 m depth and a CTD cast performed to within 22 m of the bottom in a sounding of 2905 m before launching the rectangular midwater trawl at 0230 h on 29 February. After recovering the trawl at 0800 h, course was set northwards in light westerlies to Station F, a further 200 m of CTD cable being cropped en route. A clover-leaf search for the current meter mooring was commenced at 0300 h on 1 March and abandoned at 0900 h. This mooring, fitted with an acoustic beacon and release, had previously eluded detection on CHALLENGER Cruise 16/79 and its loss is now presumed. A new mooring was laid at 1012 h after which CHALLENGER steamed to the west to commence the Anton Dohrn Seamount CTD section within sight of Rockall at 1700 h. The section was worked to the east in continuing fine weather, the top of Anton Dohrn Seamount being passed at 1500 h on 2 March. The next mooring and the Agassiz trawl were prepared that afternoon while continuing with CTD's, the section being broken at Station M shortly before midnight to allow a deep Agassiz trawl to be made at 2300 m in the early hours of 3 March. CHALLENGER returned to M in readiness for laying the mooring at

0900 h in a sounding of 2200 m, the next mooring being wound on to the winches prior to resuming the CTD section to the east at 1500 h in fine sunny weather. The section was again broken at Station R at 0100 h on 4 March to permit a further Agassiz trawl on the shelf edge. On this occasion the net fouled a bottom obstruction and the catch was lost, CHALLENGER returning to R to lay the final mooring at 0900 h in increasing southerlies. CTD lowerings and caesium sampling were resumed at 1015 h and Barra Head was passed at 1700 h in deteriorating weather. However, conditions allowed completion of the section in the Sound of Mull at 0100 h on 5 March, course then being set for Barry. Violent squalls accompanied the passage of the Sound of Islay at 0800 h, moderating considerably to allow steady progress to be made down the Irish Sea. A southerly course was held until 1600 on 6 March, when CHALLENGER turned east to run up the Bristol Channel, docking at Barry on 0800 h on 7 March.

Results: Aim 1) No trace was found of the deep mooring at Station F (57 30 N 12 16W) despite a careful search, aided by good Satnav fixes. A clover-leaf search pattern was employed, centred on the Satellite fix obtained when laying the mooring. This results in the nominal position being transversed in each of the cardinal directions so that any directional response of the mooring's acoustic beacon/ release (e.g. as a result of the release being on its side) should be circumvented. Despite good agreement between Satellite and Decca positions, a further attempt was made at the Loran position which lay some 4 miles to the northeast. With the coming of daybreak, release commands were also sent in case only the beacon part of the release had failed, but this too was unsuccessful. Acoustic noise levels

throughout the search were low, with only a slight sea running. As this mooring has previously failed to respond in November 1979 (CHALLENGER Cruise 16/79), it is now assumed to be lost. A new mooring was laid in 57 34N 12 16W at 1012 h on 1 March, good satellite fixes being noted throughout.

Mooring M was laid in 57 18N 10 20W at 1039 h on 3 March and mooring R in 56 59N 09 00W at 0849 h on 4 March. No difficulty was experienced when laying these moorings, except that the arrangement of the winch switchgear makes it impossible to assemble moorings on to the auxiliary winches at the same time as performing CTD casts. This caused the loss of some hours of fine weather.

Aim 2 and 3) A total of 37 CTD casts was performed. The Anton Dohrn Seamount section was worked almost continuously from west to east, with only two breaks for moorings and trawls at Stations M and R. Additional stations were inserted on certain segments for the study of slope currents, and a deep cast was performed to 2880 m at the permanent benthic station, recording a bottom temperature of 2.7°C. Well developed surface mixing to a depth of more than 300 m was found at some sites, with a fairly uniform surface mixed layer temperature of 9.6°C over the deeper water.

After cropping 700 m of CTD cable at an early stage, no problems were experienced with stranding of the wire. The cable refused to lay neatly on the winch drum after the first deep cast, wear and extreme tension on the spooling gear being suspected. Several hours were lost before the cable could be spooled satisfactorily.

Aim 4) 50 litre water samples for radio-caesium analysis were collected at 12 standard sites between the shelf edge and the Sound of Mull, CTD casts being performed at all but the easternmost

station. Surface temperatures fell to 7.4°C as the coast was approached, inversions being observed at the majority of stations.

Aim 5) The epibenthic sled was successfully deployed at the SMBA permanent station and returned a haul which though small and rather well washed, contained satisfactory numbers of the species under study.

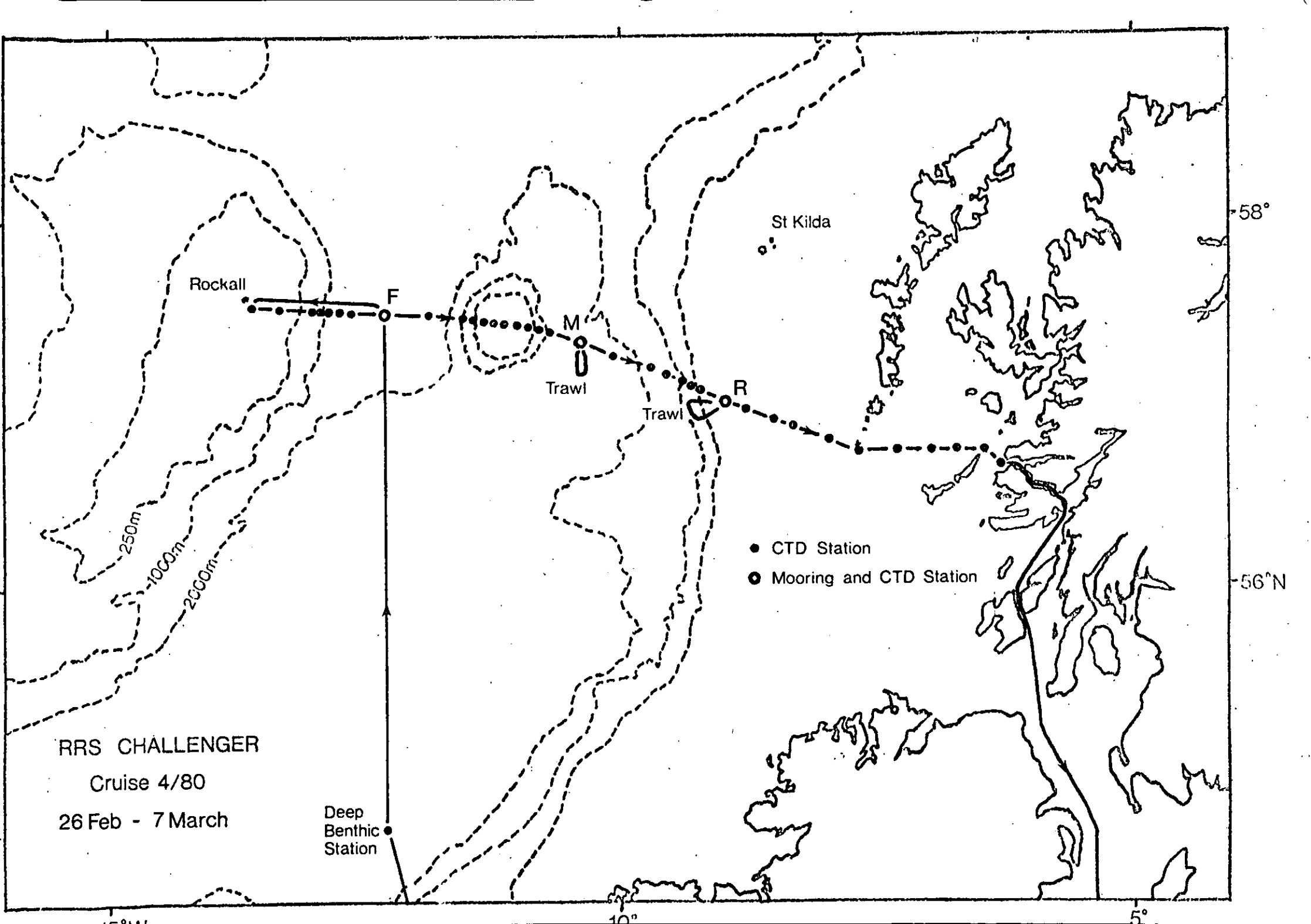
Aim 6) A rectangular mid-water trawl produced a satisfactory sample of deep plankton which is to be examined by Dr P. Tyler of University College, Swansea, in a joint study of reproductive strategies.

Aim 7) A rich haul was obtained from the Agassiz trawl at station M and will augment the time series in this area, with an emphasis on the megabenthos in contrast to the macrobenthos at the permanent station. A selection of specimens from this haul were deep-frozen for later analysis by the Radiobiological Laboratory, Lowestoft.

Miscellaneous Surface salinity samples and temperatures were obtained on passage between the permanent station and Station F, and midway between CTD stations on the continental shelf.

D.T. Meldrum

28 March 1980.


Rockall
F
M
Trawl
Trawl
R
St Kilda
58°
56°N
250m
1000m
2000m
CTD Station
Mooring and CTD Station
RRS CHALLENGER
Cruise 4/80
26 Feb - 7 March
Deep
Benthic
Station
10°
5°