

*Scottish Marine Biological Association*

*Dunstaffnage Marine Research Laboratory*



**CRUISE REPORT**

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Cruise Report

R.R.S. CHALLENGER

Cruise 8/1985

14-28 August 1985

R.R.S. CHALLENGER, Cruise 8/85

Duration: 14-28 August, 1985  
All times GMT.

Locality: Scottish Continental Shelf, Rockall Channel and  
Faeroe-Shetland Channel

Staff: D.T. Meldrum P50  
Dr J.M. Graham  
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Dr R.W. Arnold (U.C.N.W., Bangor)  
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Aims:

- (1) To make CTD transects across the shelf between the Mull of Galloway and Cape Wrath, and to collect radiocaesium samples for analysis by Glasgow University and the Fisheries Radiobiological Laboratory, Lowestoft, upon certain of the transects.
- (2) To collect bottom cores in the North Channel and Sea of the Hebrides for the Fisheries Radiobiological Laboratory, Lowestoft.
- (3) To repeat a CTD survey of the Firth of Clyde and Kilbrannan Sound.
- (4) To service SMBA mooring Y in the Tiree Passage, and to deploy a deep mooring on the eastern flank of Anton Dohrn Seamount for recovery in December or March.
- (5) To work the Anton Dohrn Seamount CTD section.
- (6) To make instrument tests of the Neil Brown 'Smart' CTD and the Bissett-Berman CTDs in a variety of environments, including the Norwegian Sea deep water.
- (7) To test the suitability of the Interocean S4 current meter for obtaining depth profiles of currents at the shelf edges.
- (8) To observe seabirds around the Hebrides for the Nature Conservancy Council Seabirds at Sea Programme.

Narrative: All staff joined CHALLENGER at Ardrossan on the evening of 12 August, but sailing was deferred until 14 August because of the late arrival of essential bunkers and subsequent injuries to a motorman. CHALLENGER finally sailed at 0955 h and started Firth of Clyde CTD stations to the east of Arran at 1230 h. Stations were worked anticlockwise round Arran, Loch Fyne being entered in the early hours of 15 August, before continuing southwards down Kilbrannan Sound in rain and gale-force winds. A replacement motorman was embarked at Brodick that evening and the Firth of Clyde stations completed in improving weather en route for the first North Channel coring site. Cores were taken at stations LE, LF and LG off Portpatrick early on 16 August, despite the temporary jamming of the bow propellor, before continuing with CTD and water sampling sections northwards. The Mull of Kintyre was cleared at 0001 h on 17 August and further sections worked in fine weather in the Sound of Jura and from Loch Indaal to Lough Foyle. Malin Head was passed heading northwest in the rain that evening, before turning east early on 18 August to work across the Islay Front, thence by Colonsay to the Firth of Lorne section and the traditional night-time passage of the Sound of Mull. Stations recommenced at Ardmore Point, permitting a detour to be made to allow rapid servicing of the Tiree Passage mooring between 0745 h and 0855 h 19 August before running stations and cores westwards to Barra Head, which was passed at 1840 h.

The shelf-edge station was completed at 0524 h 20 August and stations were continued along the Anton Dohrn Seamount section. At Q the calibration water bottle was lost on hauling due to wildly inaccurate readings on the 'wire out' counter. At station N an acoustic release was tested and course was set for the southeastern flank of Anton Dohrn Seamount, where mooring B was deployed between 1843 and 1907 h. Stations

resumed at M and continued in force 5 southwesterly winds throughout 21 August. Station A, close to Rockall was completed at 0114 h 22 August and course was set for station J12, west of Lewis, where work began at 1817 h. / The section was completed off Loch Resort at 1616 h 23 August in quiet weather and section M begun off the Butt of Lewis at 2057 h. The northeasterly winds freshened during 24 August after completion of this section, and upon reaching the fifth station of a section crossing the Wyville-Thomson Ridge at 2312 h work was suspended by 40 kt winds. Work was resumed in the Faroe-Shetland Channel at 0847 h 25 August with tests of the CTDs, followed by stations along the axis of the channel, and thence southeastward to Cape Wrath, which was reached at 0855 h 26 August. Sections L, K and N in the North Minch and Little Minch were worked during this day and 27 August in continuing squally weather. The CTD section from Loch Boisdale was begun at 1732 h and six stations were completed to the Small Isles by 2342 h when force 8 southerly winds terminated work for the cruise.

CHALLENGER set course for Dunstaffnage via the Sound of Mull and hove to in Ardmucknish Bay at 0536 h 28 August. Scientific staff left the ship at 0800 h whilst the ship awaited wind and water conditions to enter Dunstaffnage Bay, finally mooring at the pontoon at 1725 h.

#### Results:

Aim 1) Details of the CTD transects worked during the cruise are given in Table 1. The Scottish shelf was well sampled between Galloway and the Wyville-Thomson Ridge and surface and subsurface radiocaesium samples obtained across the coastal current at four latitudes.

Aim 2) Bottom cores were obtained for the Fisheries Radiobiological Laboratory at three North Channel current meter mooring sites and at five of the standard sampling stations between the Sound of Mull and the shelf-edge where suitable bottoms were found.

Aim 3) A grid of 31 stations in the outer Firth of Clyde, Kilbrannan Sound and Lower Loch Fyne was worked, repeating surveys made in autumn 1984 and winter and spring 1985.

Aim 4) The Tirez Passage current meter mooring was successfully serviced on 19 August. A sub-surface mooring carrying three Aanderaa current meters was laid upon the southeast flank of Anton Dohrn Seamount in depths of 1400 m on 20 August to provide data upon eddy-shedding by the Seamount.

Aim 5) The Anton Dohrn Seamount CTD section was worked between 0420 h 20 August and 0114 h 22 August, the only problems encountered being with the meter wheel readout, and which led to the loss of a water-bottle and thermometers at station Q.

Aim 6) Tests with the Neil Brown 'Smart' CTD were carried out on a number of occasions and revealed a number of faults which require rectification before the instrument is available for regular use. The former MAFF STD, now converted to a CTD, was tested in deep water in the Faroe-Shetland Channel, being cycled through several lowerings. The results showed sensitivity to pressure, which later investigation suggested could have arisen from loss of oil from the conductivity head.

Aim 7) An Interocean S4 electromagnetic current meter was lowered on the hydrowire at stations crossing the slope zone north of St Kilda and at the Wyville-Thomson Ridge. A five-minute cycle of three minutes fast sampling followed by two minutes off enabled the instrument to be held at successive 100 m horizons. Decca Navigator fixes at five-minute intervals provided the ship's motion. The results will require evaluation ashore.

Aim 8) Data on the distribution and abundance of seabirds gathered during the cruise extend and complement those obtained by E.I.S. Rees

during a similar cruise in 1983. The same standard NCC Seabird Group methods were used, and a total of 428 standard 10-minute measured-transect blocks were recorded (with a further 28 part-blocks), covering a steaming distance of some 1,050 km. In addition to the concentration zones of moulting Guillemots and Razorbills (auks being a study target group) noted in 1983 can be added Kilbrannan Sound and from Cape Wrath to Stoer Point (as well as extensions to several zones described in 1983: and useful confirmation of the latter). The North Channel and the south-western Sea of the Hebrides (as well as beyond the continental shelf) appeared devoid of auks, apart from occasional Puffins. In all, the distributions and abundances of 25 species of seabird were described during the timed transects. The data have been deposited with the NCC Seabirds at Sea team at Aberdeen, as part of an ongoing study. (R.W. Arnold).

Acknowledgements: Thanks are due to Captain S.D. Mayl, his officers and crew for their help and encouragement during a very productive cruise.

D.T. Meldrum

13 September 1985.

Table 1. Stations and sections worked during Challenger Cruise 8/1985.

Stations	CTD Disc/ Dip. Nos.	Location	Dates 1985	Observations	
FC1-FC31	023/001-031	Firth of Clyde	14-15 Aug.	CTD	
LE,LF,LG	024/032-034	North Channel	16 Aug.	CTD, Cs bottom, Cores.	
1Z-6Z	024/035-040	Copeland-Portpatrick	16 Aug.	CTD, Cs surface; Cs bottom (2-5)	
1Y-5Y	024/041-045	Corsewall-Sanda	16 Aug.	CTD.	
1A-5A	024/046-050	Kintyre-Antrim	17 Aug.	CTD, Cs surface	
1B-5B	024/051-055	Gigha-Islay	17 Aug.	CTD; N.B.CTD tests (3&4)	
7C-1C	024/056-062	Islay-L. Foyle	17 Aug.	CTD.	
OD-1D	024/063-064	} W. of Islay	18 Aug.	CTD.	
2D-8D	025/065-071		18 Aug.	CTD; N.B.CTD tests (1&2)	
1E-5E	025/072-076	} Sound of Mull - shelf-edge	18-20 Aug.	Surface S <sub>0</sub> ; CTD (not 3,5,8, &12); Cs surface, mid and bottom (at 1,2, 4,6,7,9,11,13-16); Cores (4,7,9,14 and 16).	
1G-16G	025/077-090		20-22 Aug.	CTD.	
Q,P	025/091-092		} Anton Dohrn Seamount section	20-22 Aug.	CTD.
O,N,B	025/093-095			20-22 Aug.	CTD.
M-J	027/096-099	20-22 Aug.		CTD.	
I,D	026/100,105	20-22 Aug.		CTD.	
H-F	028/101-103	20-22 Aug.		CTD.	
E	029/104	20-22 Aug.		CTD.	
C,B	025/106,107	20-22 Aug.	CTD.		
A	027/108	20-22 Aug.	CTD.		

Table 1. Continued

Stations	CTD Disc/ Dip. Nos.	Location	Date 1985	Observations
12J	028/109	} N.W. from L. Resort	22-23 Aug.	CTD; current profiles (6-12); Cs surface (2-8); Cs bottom (3,5,7)
11J-5J	029/110-116			
4J-1J	027/117-120			
1M-9M	030/121-129	NW Butt of Lewis	23-24 Aug.	CTD.
1WT-3WT	030/130-132	} Wyville-Thomson Ridge	24 Aug.	CTD; current profiles (1&2).
4WT	031/133			
12Q-11Q	031/134-140	} NW from Cape Wrath	25-26 Aug.	CTD; CTD tests (11&12)
10Q-8Q	032/141 143			
7Q	031/144			
6Q-1Q	032/145-150	Eddrachillis Bay - Broad Bay	26 Aug.	CTD
1L-6L	032/151-156			
9K-7K	032/157-159	} L. Gairloch-L. Seaforth	26-27 Aug.	CTD; Cs surface and bottom (1-4,6,8)
6K-1K	033/160-165			
6N-1N	033/166-171	L. Maddy-L. Dunvegan	27 Aug.	CTD.
HD1-HD6	033/172-177	L. Boisdale-Eigg	27 Aug.	CTD; N.B. CTD tests (1&2)



R.R.S. CHALLENGER Cruise 8/1985 : Ship's track (2).

