

*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.***

CRUISE NO. 12/1981

LEG B

14th - 21st August

1981

RRS CHALLENGER, CRUISE 12/81 Leg B

Duration of Cruise : 14-21st August 1981

Locality : Rockall Trough

Participants : Dr P.A. Tyler, Univ. Coll. Swansea  
Dr J.D. Gage, S.M.B.A.  
Mrs M. Pearson, S.M.B.A.  
Miss K. Faccenda, S.M.B.A.  
Miss S. Pain, Univ. Coll. Swansea  
Mr A. Muirhead, "  
Mr J. Wright, "  
Mr G. Paterson, British Museum (Natural History)  
Mrs P. Fry, Luton College of Technology  
Mr S. Smith, R.V.S.

Aims : 1) To obtain seasonal samples of deep-sea benthos and deep plankton at the SMBA Permanent Station and at Station 'M' using epibenthic sled, Agassiz trawl, RMT 1 and Spade Box Corer.  
2) To obtain samples of deep sea benthos from two stations on the Feni Ridge using Agassiz Trawl and Spade Box Corer.

Narrative : (all times GMT)

Challenger left Dunstaffnage Pier at 12.30 hrs on 14th August for the Permanent Station at 54° 40'N 12° 16'W. Wind and seas were moderate to good and Challenger arrived on station at 19.45 hrs on 15th August. Sea conditions were relatively calm and the RVS Spade Box Corer was lowered overboard at 20.00 hrs. When retrieved at 21.42 hrs the eye of the main warp had caught over one of the protruding bolts after the triggering mechanism had been fired resulting in the loss of the sample. The Spade Box Corer was redeployed at 22.05 hrs and retrieved at 23.53 hrs containing a perfect sample with an undisturbed surface.

At 01.07 hrs on the 16th August the Epibenthic Sled was lowered overboard. The sled was fitted with a new timing mechanism for the closing of the sled door. When retrieved at 05.30 hrs the sled door was closed but contained no sample. It is believed that the new timing mechanism malfunctioned and closed the sledge door early.

The RMT 1 was deployed at 06.25 hrs and recovered at 09.30 hrs containing an excellent sample of deep water plankton. The sled, with the door locked open, was redeployed at 09.40 hrs and successfully recovered at 14.13 hrs containing a large sample with a wide variety of benthic invertebrates.

The Challenger then steamed NW to the second station at 56°N 14 01'W arriving at 02.31 hrs on the 17th August. The RVS Spade Box Corer was deployed at 02.39 hrs. A pinger was fitted at 10 m and by using the PDR we were able to trace the SBC right to the seabed. Indications from the PDR and the continuous tension recorders suggested a successful sample had been collected with no apparent anomalies. The sea surface was relatively calm with a maximum wave height of 60 cm at 03.50 hrs when the SBC broke the surface. As the shackles and the swivel moved through the block on the aft A-frame the wire attaching the spade to the main warp parted the the SBC fell back into the sea and was lost. The position was fixed but there was no possibility of recovery and the SBC was abandoned. Mr S. Smith (R.V.S.) was present at the loss and recovered the only piece of wire that remained attached to the main warp. On close inspection it would appear that 8 mm instead of 10 mm wire was used in the construction of the SBC and that this wire parted due to the additional strain of the shackles and swivels passing through the block. No one was hurt during the incident.

At 04.34 hrs the Agassiz trawl was deployed. The tension readings were higher than normal and when the Agassiz was recovered at 08.15 it was found to contain a large boulder as well as an adequate sample.

On completion of this station Challenger steamed to Station 'F' (57° 26.7'N 11.59.8'W) arriving at 21.32 hrs on the 17th August. The sea conditions were worsening with a wave height increasing to two meters. The Agassiz Trawl was deployed at 22.08 hrs. After only 100 m of warp had been paid out the winch was stopped due to ship requirements. The starboard auxilliary winch had also engaged and tangled the wire on the drum. On freeing the wire the main warp was paid out to 2000 m when the bridge informed us that the set of the ship was bringing us too close to Current Mooring 'F'. The Agassiz Trawl was recovered and shot again at 00.30 hrs on 18th August at 57°22.1'N 12°00.7'W. The Agassiz was recovered at 04.45 containing an excellent haul.

On completion of station 'F' the Challenger proceeded to the Anton Dohrn seamount (57°27.6'N 11°06.9'W) arriving at 09.37 hrs on the 18th August. The Agassiz trawl was deployed at 09.51 hrs. The Agassiz was recovered at 11.00 hrs but contained only one specimen as the cod-end failed. It was redeployed at 11.28 hrs. After deploying 1250 m of wire and towing the tension increased to 5 tons and the Agassiz was retrieved. The weak link had broken and the front bar had separated from the runners. It did, however, contain a sample.

The Challenger now proceeded to Station 'M' (57°23.9'N 10°20.3'W) arriving at 16.30 hrs on the 18th August. The Agassiz was deployed at 16.40 hrs and retrieved at 20.38 hrs and contained a large and excellent sample. The RMT1 was deployed at 22.14 hrs and retrieved at 00.30 hrs on the 19th August containing a successful sample. The Epibenthic Sled was deployed at 01.35. On recovery at 05.18 hrs it contained no sample and was redeployed at 06.25. Recovery was achieved at 10.12 and the sled contained an excellent haul. Due to poor sea condition the SBC was not deployed.

The Challenger now proceeded to 56°36.7'N 9°15.0'W arriving at 19.30 hrs on the 19th August. The sled was deployed but on recovery at 21.56 hrs contained no sample.

The Challenger then steamed for Ardrossan arriving at 05.30 hrs on the 21st August.

Results :

Aim 1) Good samples were obtained at both the Permanent Station and Station 'M' (see Tables ). Material was either fixed in 8% seawater formalin, frozen or pieces of tissue were fixed for EM processing. Selected material from Station 'M' is to be forwarded to the Radiobiological Laboratory (MAFF) at Lowestoft for analysis (Dr J. Pentreath).

Aim 2) Samples from the Feni Ridge were successfully collected with the Agassiz trawl after the loss of the Spade Box Corer.

Special note on the Spade Box Corer

The RVS Spade Box Corer worked perfectly at the two stations it was deployed. The calm sea conditions partly contributed to this success as did the technical work carried out by Mr S. Smith and R.V.S. The reason for the loss of the SBC is still to be determined. Possible reasons for the SBC wire parting may be

1) due to the wrong diameter wire being used. This is to be clarified by Mr S. Smith at R.V.S.

2) a strain imposed by the shackles and swivel passing through the narrow block. Shackles have jammed in the block before and we wonder if it is possible to increase the gap between the top of the block and the wheel.

As sea conditions were calm and there was no obvious anomalies in either the PDR record or the tension record the method of deployment was considered satisfactory.

Conclusions

Despite the unfortunate loss of the Spode Box Corer this was a most successful cruise with all primary objectives being achieved. We wish to thank the Master, Officers and Crew of Challenger for their untiring efforts throughout this cruise.

P.A. Tyler

Details of stations worked

Positions fixed from satellite navigation (Magnavox 1107).

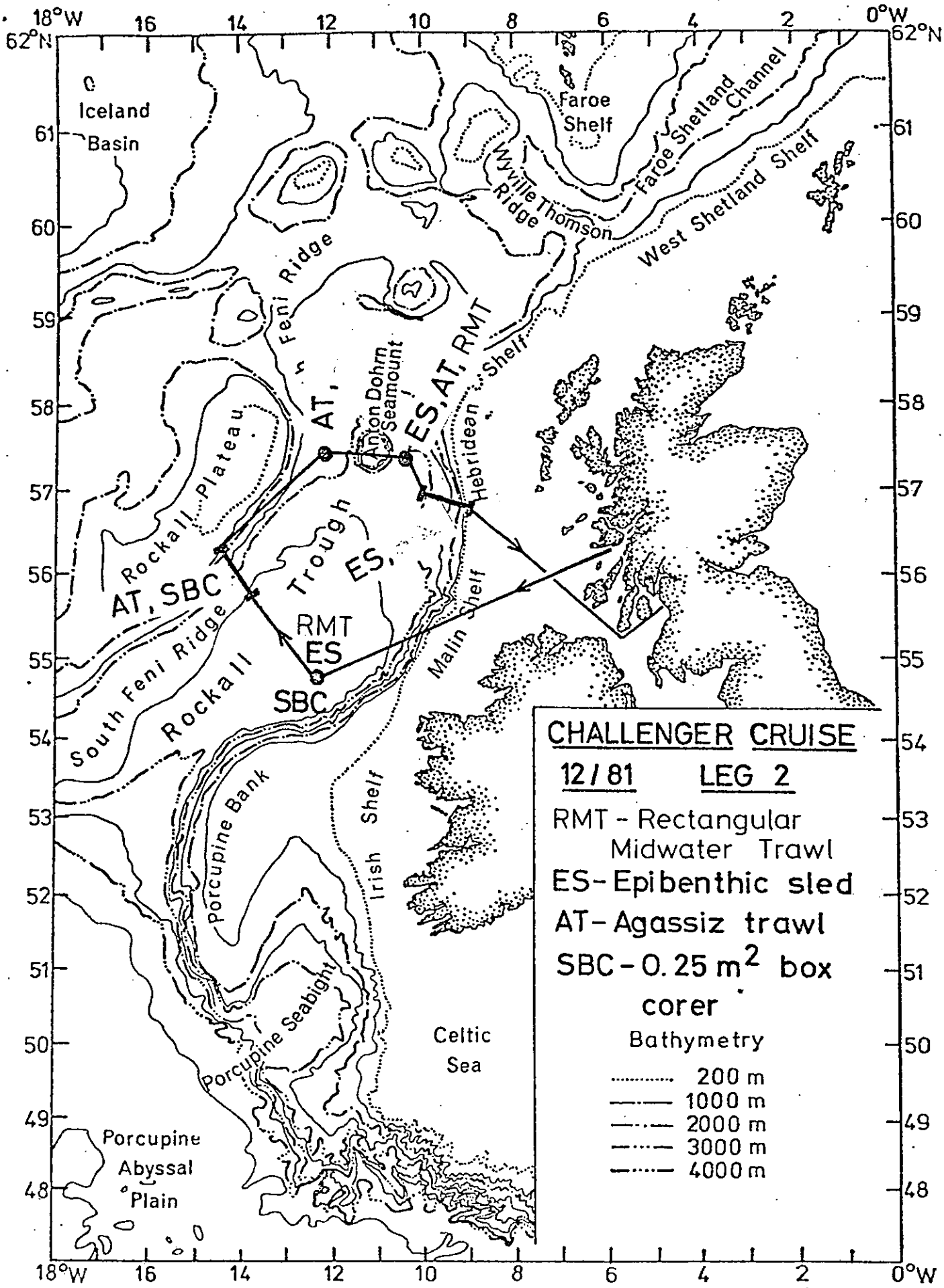
Depths given in corrected metres (Matthews, 1939: Tables of Velocity of Sound in Pure Water and Sea Water). Probable fishing depth for mid-water gear is given in parentheses.

Positions for towed bottom-sampling gear is mid-point of track of gear on bottom, calculated from ship's position, bottom depth, and wire angle and payout.

Deployment	SMBA sta. no.	Gear	Date	Time on bottom or at maximum towing depth (hrs. GMT)	Position	Depth	Result
1	-	Box corer (RVS)	15 Aug	20.56	54°39.3'N 12°17.0'W	ca2880	No sample
2	SBC 188	" } G04	"	22.54	54°40.6'N 12°16.1'W	2876	Excellent sample
3	-	Epibenthic sled	16 Aug	-	54°40'N 12°16'W	ca2880	No sample
4	RMT 189	RMT-1 B09	"	07.10-08.30	54°43'N 12°19'W	2876 (ca 1150)	Good sample
5	ES 190	Epibenthic sled	"	11.12-13.15	54°41'N 12°18'W	2898	Excellent sample; approx. 3 nm bottom track.
6	-	Box corer (RVS) G04	17 Aug	03.19	56°00.2'N 14°02.1'W		Corer lost on recovery.
7	AT 191	Agassiz trawl	"	06.15-07.30	56°00'N 13°58'W	2190	Small sample plus large boulders.
8	AT 192	"	18 Aug	02.00-04.00	57°21'N 12°02'W	1862	Excellent sample



9	ES 193	Epibenthic sled	18 Aug	10.10-10.45	57°28'N 11°08'W	616	Cod end gone, one cidarid recovered.
10	AT 194	Agassiz trawl	"	11.45-12.00	57°27'N 11°10'W	631	Frame damaged; small sample.
11	AT 195	"	"	18.30-19.50	57°23'N 10°27'W	2190	Excellent sample; approx. 3.2 nm on bottom.
12	RMT 196	RMT-1 <i>Boq</i>	"	22.50-23.45	57°24'N 10°20'W	2170 (ca.1000)	Good sample
13	-	Epibenthic sled	19 Aug	-	57°23'N 10°23'W	2200	No sample
14	ES 197	"	"	08.00-09.30	57°21'N 10°29'W	2200	Excellent sample; approx. 4 nm bottom track.
15	-	"	"	-	56°42'N 09°12'W	1077	No sample



18°W 16 14 12 10 8 6 4 2 0°W

62°N 61 60 59 58 57 56 55 54 53 52 51 50 49 48

Iceland Basin

Faroe Shelf

Wyllie Thomson Ridge

Faroe Shetland Channel

West Shetland Shelf

Feni Ridge

Rockall Plateau

AT, AT, RMT

Anton Dohrn Seamount

ES, AT, RMT

Hebridean Shelf

Trough

ES, ES

South Feni Ridge

Rockall

RMT ES

SBC

Malin Shelf

Porcupine Bank

Irish Shelf

Porcupine Seabight

Celtic Sea

Porcupine Abyssal Plain

18°W 16 14 12 10 8 6 4 2 0°W