INSTITUTE OF GEOLOGICAL SCIENCES
MARINE GEOLOGY UNIT
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Cruise Report

m.v. Whitethorn

Leg 80/WH/10 22 October - 5 November

LEG 6?

by

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1. Introduction

The purpose of this cruise was to complete the sampling programme carried out earlier this year in the region from the Aberdeenshire coast to the median line between 56°N and 58°N. The particular sheets still requiring completion were Marr Bank SE and Peterhead NE. The sampling equipment used consisted of a vibrocorer, gravity corer and shipek grab. This leg was also to be used to provide an opportunity for trials of the vibrocorer from a 'live' ship.

In spite of consistently bad weather the Marr Bank Sheet SE was completed, but no further sampling was undertaken on the Peterhead Sheet NE due to weather conditions. The bad weather did provide an opportunity for extensive equipment trials, in particular the 'live' ship vibrocorer exercise which proved highly successful.

2. Personnel

J Chesher		Principal Scientist
A Skinner		
N Ruckley		
J McGuigan		
M McMillan		
P Wiggins		
P Balson	(Leeds)	
J Pheasant	(Aimers McLean)	

3. Results

A total 74 sample stations were occupied comprising 19 vibrocores, 54 gravity cores, and 73 shipek grab samples were taken on the Marr Bank Sheet SE. Although it would have been better to have completed a

slightly closer grid of vibrocorer sites, sufficient were taken to give an initial appraisal of the geology of the area.

As can be seen from the table below considerable survey time was lost due to bad weather, although this time was fully utilised on equipment servicing and trials.

Time Utilisation Percentage

On Passage	Traversing	Anchoring	On Station	Weather
6.0	27.0	6.0	17.0	43.0

4. Geology

The Marr Bank Sheet SE has an almost ubiquitous cover of fine olive grey fairly well sorted sand less than 0.5 metre in thickness. A band of bivalve shell dash some 0.10m thick is often present within the olive sand, generally towards the base. The only area this olive sand is not present is in the SE corner of the sheet where a gravelly yellowish sand is present on the seabed.

Beneath the surficial olive sand is a very fine grained well sorted thixiotropic grey sand that is present throughout most of the area. This sand, characterised by its good sorting, well rounded grains, and rapid dewatering properties, had been noted in earlier work this year in the Devil's Hole area to the east (see Cruise report 80/WH/05). Underlying the grey sand and sometimes interdigitating with it were soft grey and brown clays, with only occasional small pebbles.

5. Ship and IGS Equipment Performance

Ship

Ship performance was as in previous legs apart from a 23 hour breakdown

period for repair to a cracked piston in No. 1 cylinder. This repair was effected with extreme efficiency taking only 5 hours to complete repairs, the additional downtime arising from the need to steam to a sheltered anchorage.

The Atlas Deso echo sounder worked only intermittently, a fault noted on previous legs.

IGS Equipment

No downtime was acquired due to failure of IGS equipment using the standard retraction vibrocorer, shipek grab and gravity corer. This statement must however be qualified in that had the need arisen to use the mididrill or 'live' ship vibrocorer several days would have been lost in servicing these systems prior to their use, as evidenced by the fact that several days weather downtime were used to get these systems operational. The faults, many of which were identified at the beginning of the season, can be summarised as follows:

i) Cable hauling winch switch relay

ii) TV camera, lead termination

iii) Midi drills rusted up, required complete service

iv) Chain block siezed

v) Nylon hoist rope was not spliced, but tied in a bowline

vi) No developing gear on board to test camera grab.

Live Ship Vibrocore Operation

The live ship exercise proved highly successful, although a more efficient handling system for the buoyant power cable must be acquired since it is not easy to handle in its present mode. The ship maintained station with the buoyed vibrocorer 100 metres off the port bow for a period in excess of 45 minutes, which was easily sufficient time for full

penetration, and manoeuvered alongside again for recovery.

The vibrocorer was launched and recovered in the normal mode and the load transferred to the nylon rope with a direct lead over the gravity corer block for the operation. The gravity corer winch, after replacing the relief valves and subsequently removing the manual override in Great Yarmouth, proved capable of lifting the vibrocorer, although it was found that a direct lead over the gravity corer block was 30% more efficient than the triple block arrangement required to utilise the main A frame.

It should be commented here that although the gravity corer winch modification had been completed by Lebus several weeks ago in Yarmouth, the information received from the ship was that the winch was still incapable of lifting the vibrocorer, a fact that proved erroneous and caused considerable time wastage in lengthy discussions with Lebus on this matter.

Midi Drill

The midi drill appeared to operate satisfactorily after extensive overhaul, but failed to drill rock outcrop when tried in the Minches, due to a blockage in the hydraulics system preventing the carriage from freefalling.

6. Ship's Log

Wed 22 Oct

0000-2200	In port Leith, routine port call
2200-2400	Steaming to Marr Bank Sheet

Thurs 23 Oct

0000-1000	Steaming to Marr Bank Sheet
1000-1530	Vibrocoring Sheet 56^{o}N 01^{o}W
1530-1630	Terminated vibrocoring due to heavy swell (20ft). Generator overheated due to doors being shut, allowed to cool down.

1630-2400 Routine sampling. Marr Bank SE

Fri 24 Oct

0000-0830 Routine sampling Marr Bank SE

0830-0945 Attempted anchoring for vibrocorer. Too heavy swell, abandoned site.

0915-2100 Routine sampling Marr Bank SE.

2100-2400 Abandoned sampling due to heavy swell. Shipek damaged swinging against ship's side. Gravity corer deck awash.

Sat 25 Oct

0000-0800 Steaming into weather, no sampling.

0800-2100 Routine sampling gravity corer and shipek. Swell to severe to vibrocore.

2100-2400 Vibrocore site.

Sun 26 Oct

0000-0600 Routine sampling Marr Bank SE Sheet.

0600-0900 Vibrocoring.

0900-1500 Routine sampling since weather too bad to vibrocore. Very heavy swell.

1500-2300 Vibrocoring.

2300-2400 Routine sampling.

Mon 27 Oct

0000-0600 Routine sampling Marr Bank Sheet SE. (lost shipek on bilge heel).

0600-1820 Steaming to Berwick coast for shelter to replace No. 1 cracked cylinder in main ship's engine.

1900-2400 Repairing ship engine. Trials on vibrocore lifting using nylon rope and Lebus winch. This proved successful.

Tues 28 Oct

0000-0500	Steaming back to Marr Bank SE Sheet.
0500-0700	Routine sampling Marr Bank SE Sheet.
0700-2100	Vibrocoring Marr Bank SE.
2100-2400	Routine sampling Marr Bank SE.

Wed 29 Oct

0000-0100	Routine sampling.
0100-1900	Steaming towards Aberdeenshire coast for shelter. Westerly gales force 8-9.
1900-2400	At anchor off Stonehaven awaiting weather.

Thurs 30 Oct

0000-0700	At Anchor.
0700-1630	Vibrocore trials using 'live ship', nylon rope and buoyant power cable. Service Midi drill.
1630-2200	Steaming towards Peterhead to midi drill site.
2200-2400	Awaiting weather.

Fri 31 Oct

0000-0700	Awaiting weather.
0700-1200	Steaming to Moray Firth off Fraserburgh for shelter.
1200-2130	Midi drill trials
2130	Steaming into Fraserburgh coast for shelter. Southerly force 10 gale.
-2400	At anchor due to weather.

Sat 1 Nov

0000-0700	At anchor off Fraserburgh due to weather.
0700-2100	Midi drill trials.
2100-2400	At anchor awaiting weather.

Sun 2 Nov

0000-0800	At anchor awaiting weather off Fraserburgh.
0800-1000	J Pheasant put ashore by zodiac at Gordenstown.

1000-2400 Steaming to W Coast.

Mon 3 Nov

0000-2000 Steaming south along W. Coast.

2000-2400 Midi drilling north of Coll.

Tues 4 Nov

0000-0700 Steaming to SW Tiree

0700-1500 Vibrocoring SW Tiree

1500-2400 Steaming to Ardrossan

Wed 5 Nov

0000-0730 Steaming to Ardrossan routine port call

0730-2400 In port Ardrossan, routine port call.

7. Acknowledgements

I should like to thank all IGS and ship's personnel on board for their help and cooperation during this leg. In particular acknowledgement is due to Captain Anholm for all his assistance throughout the cruise.