I.O.S.

RRS JOHN MURRAY CRUISE 6/75

18 APRIL – 6 MAY

EAST COAST SURVEY

CRUISE REPORT NO 25

1975

NATURAL ENVIRONMENT RESEARCH COUNCIL
INSTITUTE OF OCEANOGRAPHIC SCIENCES

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1975

Institute of Oceanographic Sciences
Crossway
Taunton
Somerset

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Scientific Personnel

Mrs B J Lees (Scientist in Charge)
J O Malcolm
Miss H L King
D E C Whiteway
P M Hooper
D Hill
D Joyce
T A Upham
N A Frederiksen (Observer)
G W J Miller (IOS Barry)
P Mason "
P Taylor "

Ship's Officers

G Long (Master)
P Davies (1st Officer)
P Tilbury (2nd Officer)
M Tutman (3rd Officer)
D Gregory (3rd Officer)
P Byrne (Chief Engineer)
P O'Keefe (2nd Engineer)
N Walters (3rd Engineer)

OBJECTIVES

1. To lay six Plessey self-recording current meter rigs, five on the seaward side of the Sizewell-Dunwich Bank and one inshore from the bank. To monitor continually current velocity and direction at midwater level to provide input data for a mathematical model (IOS Project S41B) and for the field study itself (S41A). To recover the six moorings at the end of the cruise.

2. To supplement the geophysical survey begun on Cruise 2/75 of the RV Edward Forbes, February 1975 (see Cruise Report No 19), where data was either incomplete or of poor quality.

3. To undertake diver inspection of the current meter rigs as soon as possible after mooring to ascertain whether they are correctly moored, whether the meters are functioning, and to photograph the rigs on the seabed. To repeat this inspection at the end of the cruise immediately prior to recovery of the meters. If conditions permit, to examine the topography and lithology of selected areas of the seabed.

4. To sample the seabed adjacent to the Sizewell-Dunwich Bank, firstly with a van Veen grab to give an approximate idea of sediment distribution on the seabed. To use this to provide a basis for sampling with a Reineck box corer, these samples to be returned to the Taunton Laboratory for subsequent detailed analysis.

CRUISE LOG : 18 April to 6 May

Friday 18 April — B J Lees, G W J Miller, P Mason, P Taylor aboard. Wind force 1-2, good visibility, clear sky (Lowestoft 1500 hrs) but gradually thickening mist encountered as ship sailed south. Visibility less than 50m when first station (No 9) reached. (Decca Red J 11.40 Green C 35.20). Decided to anchor inshore and remain there overnight.

NB: Current meters should be laid at the beginning of a cruise to give the maximum time in the water. On Cruise 6 this was within a day of neap tides and therefore there would not be sufficient depth of water inshore from the bank for the John Murray to lay the inshore rig. After consultation with the ship's master on this point it was decided to position the sixth rig south of and in line with the five moorings on the seaward side of the Sizewell - Dunwich Bank (Fig 1).

Saturday 19 April — Wind force 4, good visibility. Six buoy-moored Plessey current meter rigs (one meter per rig) successfully deployed at Stations 9 (Red J 11.40, Green C 35.20), 10 (Red J 8.68, Green C 35.69), 11 (Red J 6.03, Green C 36.40), 12 (Red J 2.44, Green C 37.70), 13 (Ref I 23.29, Green C 38.76) and 14 (Red I 20.69, Green C 39.36). Again anchored overnight inshore south of Southwold.

Sunday 20 April — Grab sampling commenced. Each sample was examined, its features noted, and then it was discarded. 40 stations were sampled. Left area for Lowestoft at 1445 to catch high tide. G W J Miller, P Mason and P Taylor disembarked. H L King, P M Hooper, D E C Whiteway embarked and loaded geophysical equipment.

Monday 21 April — In port for repairs to holed pipe - part of winch system (Paxman). P M Hooper and D E C Whiteway set up, repaired where necessary and checked geophysical equipment. Sailed at 1730 hours to S of Southwold, anchored. Successfully tested boomer and hydrophone. Unable to get 500 joule bank diode box working satisfactorily, although difficulty did not appear to be with box. Decided to use 165 joule box.

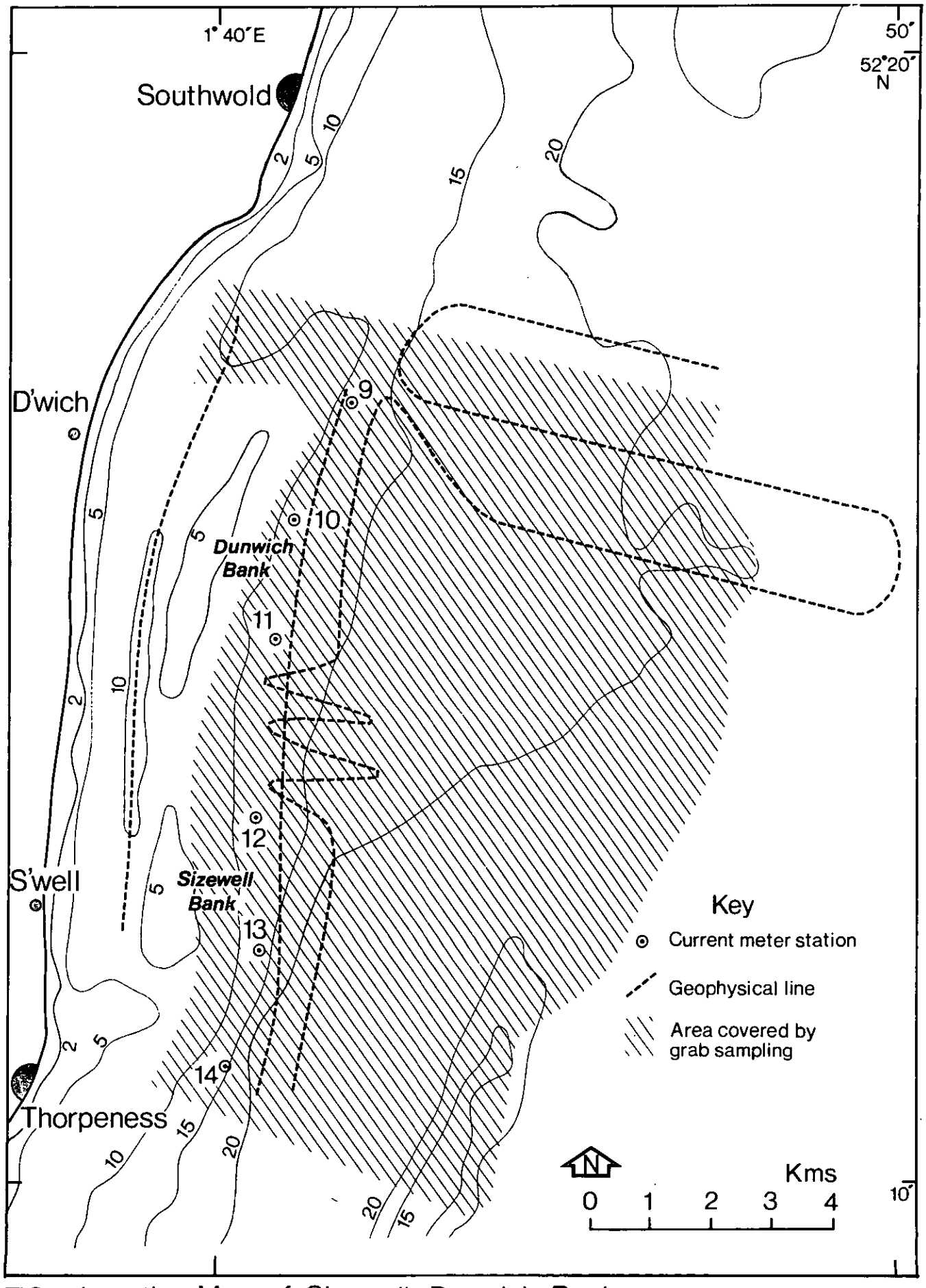

FIG 1. Location Map of Sizewell - Dunwich Banks

Tuesday 22 April — Wind force 1, sea state 1. Geophysical data, using boomer, obtained along three lines, one inshore and two seaward of bank, plus additional data to NE of bank. All six current meter rigs sighted on correct stations. Returned to Lowestoft. J O Malcolm, D Hill embarked. Box corer and diving equipment brought aboard.

Wednesday 23 April — PMH, DECW disembarked. Grab sampling until slack water. JOM, DH prepared for diving on current meter rig at Station 9. (See attached Dive Report, Appendix A). Diving abandoned 1516 hours. Grab sampling recommenced after adjustments to Paxman. Toroidal buoy at Station 10 observed to be inverted. Returned to Lowestoft, berthing at 2030 hours. Box corer assembled on deck by scientists.

Thursday 24 April — DH disembarked, taking diving equipment. Box corer sampling delayed until 1300 hrs because of thick fog. Three samples obtained but winch distinctly jerky. Rubber on corer cutter damaged, ∴ sampling ceased and grab sampling recommenced. Berthed at Lowestoft 2039 hours. T A Upham embarked.

NB For proper working of box corer ship should be stationary whilst coring. Feasibility of anchoring at each station was discussed with Bo'sun, but as ship's anchor chain is not self-stowing this was not practicable.

Friday 25 April — BJL, HLK disembarked. J O Malcolm on board as Senior Scientist. (Following cruise report is paraphrased from JOM's log). Replacement rubber for box corer obtained from MAFF laboratories. Grab sampling undertaken during repair to box corer. 1446 hours box coring commenced. Winch jerking and corer was bent. Frame partially broken during second attempt, but coring continued. Winch action was deteriorating and corer frame parted at third station. Coring abandoned. Grab sampling continued for remainder of working day. Toroidal buoys at Stations 10 and 13 inverted.

Saturday 26 April — Box corer repaired during day by ship's engineers. Grab sampling until 1830 hours, abandoned because of fog. Toroid at Station 13 still inverted.

Sunday 27 April — Repairs to main winch. Grab samples taken until 1458 hours. Echo sounding runs made during repairs to study topography of clay and other sediments. Anchored overnight off Aldeburgh.

Monday 28 April — Winch ready for testing. Failed test, and more repair work necessary. Sampling prevented by fog. Returned to Lowestoft, with partial aim of getting extra help with winch, but fog prevented entry into harbour. At 1600 hrs winch would lift and lower corer onto deck.

Tuesday 29 April — In port for water and bunkering. Visit from Mr Thorpe, East Anglian Inspector of Fisheries. DH and N A Frederiksen (Observer) arrived, and loaded diving equipment onto ship.

Wedesday 30 April — Completed bunkering. Sailed at 1300 hours. Wind force 4-5, sea choppy. Cold. Coring commenced at 1500 hours, but corer not tripping. Corer bent, then broken. Sampling abandoned. Dive made on current meter rig at Station 10 (See Appendix A, Dive Report). Diving terminated because of high risk. Anchored overnight.

Thursday 1 May — Wind force 5-6, sea choppy. Overcast. JOM, DH and TAU departed for Lowestoft in pilot boat at 1400 hours. NAF remained on board. Worsening weather conditions forecast. Wind already force 7, ship swinging at anchor. Decision made by master to attempt current meter recovery one day earlier than planned. (Following part of report is taken from NAF'S log). At 1500 hours current meter rig recoveries commenced. Moorings from Stations 9, 10, 11, 12, and 13 recovered successfully. At Station 14 toroid recovered, but wire parted. No grapnelling irons aboard. No divers. Rig abandoned, and vessel sailed south for Barry. Was sailing south at 2015 hours.

Friday 2 May — RRS John Murray sailing to Barry. When RVB informed, ship instructed to retrace course and return to Lowestoft area to attempt recovery of sixth rig.
JOM and D Joyce (divers) directed to travel from Taunton to Lowestoft, arranging with RVB to collect Gifford grapnel at motorway service station during journey. Lodged in Lowestoft overnight.

Saturday 3 May — JOM, DJ, NAF, GWJM, and PJM aboard. Wind freshening to gale force. Grapnelling begun, pellet buoys severed on 4th pass, thereby preventing diving.

NB Under conditions of nil visibility divers must have line to travel down.
Meter finally recovered at 1420 hours. Scientific personnel disembarked at Lowestoft. RRS John Murray sailed for Barry.

COMMENTS

Management of Cruise

As will be apparent from the narrative, there was a certain amount of misunderstanding between the scientific party and the crew during the latter part of the cruise. Some lessons have been learned from this and will be applied in future, but the writer would like to make one strong plea: if problems arise between the scientists and the ship's crew, they should be sorted out as soon as possible before they ramify. In the present case all ended well, but it could have been otherwise.

Sampling

One important cause for concern has been the damage to the box corer involving breaking of its aluminium support frame. There appear to be two reasons for this damage. Firstly faults in the main winch and A-frame assembly meant that the system was rarely working properly during the cruise. There appeared to be no means of paying out the winch slowly except by jerking, which apart from damaging the corer as it hit the seabed was also dangerous for personnel handling the equipment. Secondly because the RRS John Murray's anchor is not self-stowing it was impractical to anchor at each sampling station, making it difficult to stay on station during coring. The recovery pull on the corer was then not always vertical. An even more serious consequence on one occasion was the actual dragging of the corer along the seabed. Altogether due to time out for winch repairs (two days) and damage to the corer, the box core sampling programme was cut back from three days to just over half a day.

A day was also lost whilst repairs were made to a pipe in the hydrographic winch system.

The van Veen grab could be improved as a sampling tool in coarse sediments by the addition of extra weight.

Current Meter Moorings

The writer feels that it would be helpful to clarify arrangements for having grapnels on board ship. The need for this was apparent during the first attempt to recover the sixth current meter mooring. When the toroidal buoy line parted there was no reserve method for recovering the rig and ideally a vessel should not be attempting recovery with one means only at its disposal.

Laying and subsequent recovery of current meter rigs could also be made easier by having a minimum ground line length of 80m. The 40m used in this cruise proved to be too short, probably contributing to the severing of the pellet-buoys during dragging for the sixth rig. The stability of the toroidal buoys could be enhanced by extra weight below the water surface,

either in the form of chain or a sub-tower with weighted base.

Geophysics

It has been noted that the scientists were unable to incorporate the 500 joule bank diode box successfully into the boomer system. The presence of a scientist/technician as well as the scientist/operator would have been an advantage. In practice the extremely calm weather during the geophysical runs probably acted as considerable compensation.

Diving

See recommendations in Appendix A,

Conclusions

In conclusion, the writer would like to thank the officers and crew, particularly the Bo'sun, for their co-operation.

B J Lees

APPENDIX A

Dive Report - East Coast Cruise - John Murray, 23 and 30 April 1975

Diving was to be carried out on the current meter rigs positioned along the seaward sides of the Sizewell and Dunwich Banks in order to discover whether the U-shaped moorings were properly laid and to take photographs of the meters operating.

23.4.75 The divers' task involved working down a vertical mooring from a toroidal float to ½-ton scrap chain anchor, working along a 40m ground wire to another ½-ton chain anchor then up a vertical wire past the current meter to a sub-surface buoy and then to the surface again, via a light rope with two pellet buoys.

The IOS RFD with two divers, a tender and a coxswain, was attached to the toroidal float. I dived to check conditions with D Hill standing by fully kitted. The current was very strong although the time was within one hour of predicted slack water. (I estimated 2 knots at the surface). Visibility was zero at 2m depth with no light penetrating beyond this. I was attached to the rig by a short line with a carabiner clip but this had to be unclipped at swivels, shackles and the anchors and then re-attached. From feel alone I was able to tell that the rig had been laid with a twist at the current meter anchor, which brought the ground wire about 2m up the current meter wire. This did not affect the current meter however and I was able to feel the rotor revolving. I returned to the surface and postponed any further diving due to the current and worsening sea state.

30.4.75 The sea state was much the same as on the previous dive but the current was if anything stronger although it was almost predicted slack water. After attempting to find the down line from the toroidal float, which had become inverted, ie the flashing light assembly was under the water, we had to abort this dive due to the danger involved in hanging on against the current and being hit about the head by the float in sea state 4-5. Both of us were exhausted by the time we had regained the RFD. My hands and forearms were aching for twelve hours.

If diving is to be carried out in this area it must be done in relatively calm conditions and if a temporary fixed structure is to be examined it must be done at slack water as seen from the surface, not according to prediction. Apparently there is very little slack in this area as the tides tend to slip up and down inside one another parallel to

the coast. There is no possibility of working near the banks in a visibility which will enable divers to discern differences in bottom topography of lithology or to take photographs of equipment in operation. The amount of sediment in suspension and the current velocity precludes this. Out beyond the banks, over the gravel and shelly sand areas, there is the possibility of visibility of one or two metres, but the bottom appears to be fairly uniform both in topography and lithology.

J O Malcolm