

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1975 RESEARCH VESSEL PROGRAMME

REPORT: RV CLIONE: CRUISE 14

STAFF

R R Dickson	Part time	R B Mitson
R S Millner		B Robinson
E G Shreeve		M Holley
L Woolner		Birmingham University (2)
P Hardiman (Burnham)		

DURATION

Left Lowestoft 0600 h 3 October

Arrived Lowestoft 0400 h 14 October

All times are Greenwich Mean Time

LOCALITY

Southwold - Thorpeness area, Southern North Sea

AIMS

1. To continue the benthos survey in the Southwold-Thorpeness dredging grounds.
2. Investigations of near-bottom velocity shear
3. Mapping of Southwold-Thorpeness test site using MAFF Scanner and Sector Channel recorder.
4. Suspended sediment sampling
5. Collection of Pectinaria for Mr Joyce
6. Sampling of gut contents of demersal fish species.
7. Collection of medusae for Dr Bonnett (Queen Mary College, London)

NARRATIVE

Gale force winds forced an overnight delay in sailing till 0600 h 3 October. Following Scanner tests in Yarmouth Roads, Messrs Mitson and Robinson together with two Birmingham University personnel were landed by boat at 0952 h and CLIONE then proceeded to the study area off Southwold. From 1217 h till 1748 h, 11 tows with the Agassiz trawl were made as part of the epibenthos sampling programme, followed by continuous monitoring of surface turbidity around a station grid covering the dredging grounds until 1943 h. At 0734 h, 4 October, CLIONE began the mapping of sea-floor topography across the dredged area using the MAFF Scanner and Alden recording system and working the same transects that were mapped in October 1974 before the start of dredging (CLIONE 15/74). Three survey legs were completed by 1400 h but because of intermittent and irregular loss of definition at ranges from 110-180 m

coupled with apparent noise interference, the survey was then abandoned and the Agassiz trawling programme was continued (7 tows) until 1725 h. Surface turbidity was monitored around the same station grid as before until 1956 h. An attempt to resume the Scanner survey on the following morning showed that the Scanner faults were still present and after a third repetition of the turbidity survey grid CLIONE anchored at 1205 h to begin detailed observations of turbidity and water movements at the first of four stations around this grid during the period of greatest spring tides. Surface turbidity was monitored continuously while DRCM observations were made at mid water depth, hydrocast samples of suspended sediment at the top, middle and bottom layers of the water column were collected hourly, and observations of near bottom velocity shear were made at peak tide over a complete tidal cycle until 2324 h. On 6 and 7 October this programme of observations was repeated at two further anchor stations. At 1945 h 7 October CLIONE proceeded to anchor off Lowestoft and at 0830 h 8 October Mr Holley was brought aboard by boat to carry out repairs to the Scanner receiver. During the return passage to Southwold a possible inshore site for Data Buoy 1 was investigated by grab and echo sounder. By 1035 h the scanner receiver fault (in 3rd stage unit) was repaired (though the fault concerning intermittent loss of range persisted) and Mr Holley was landed at Southwold. Between 1639 h and 2059 h a further 11 Agassiz tows were made and this survey was completed between 0552 h and 1032 h 9 October (12 tows). The grab sampling programme was then begun and continued until 1300 h when CLIONE proceeded to work the fourth anchor station (turbidity and current observations as before) until 2347 h. Scanner checks during this period showed the intermittent loss of range definition to be due to the making and breaking of a broken resistor in the transmitter drive unit thus bringing a reduction in output from 15 to 8 kW. On completion of the grab sampling programme between 0741 h and 1531 h 10 October, mapping of standard transects of the dredging ground using the Scanner and Alden recorder was re-started at 1703 h and, with interruptions due to north easterly gales a.m. 11 and a.m. 13 October, was continued to completion at 2000 h 13 October. CLIONE then conducted a Scanner and grab survey of a second inshore DB 1 site off Benacre until 2311 h before setting course to dock at Lowestoft 0500 h 14 October.

RESULTS

1. The benthos and epibenthos survey was successfully completed with 41 Agassiz tows at 17 stations and 60 successful grab samples at 20 stations.
2. The measurements of velocity shear at the peak of the ebb and flood tide during springs at 4 stations covering the dredging area will, together with earlier observations, be adequate to assess the recovery rate of dredged seabed features and to estimate the maximum size of sediment which can be brought into suspension by tidal currents.
3. At each anchor station and during both ebb and flood phases of the tide the relationship between near-surface turbidity and current strength was found to be very similar. Minimum turbidity lags behind slack water by approximately two hours and is followed by an abrupt increase in turbidity to a maximum as sediment raised from the seabed reaches the surface. Between stations, the absolute level of

turbidity at a given phase of the tide and the precise duration of the lag between slack water and minimum surface turbidity are largely functions of water depth. These observations together with the hourly depth samples of suspended sediment should provide a simple but adequate model of surface turbidity in the dredging ground against which any major contribution due to dredging outwash may be identified. Any significant contribution from this source may also be identified from the particle size distribution.

4. Using the MAFF Scanner and Alden recorder system the dredge sites and surrounding seabed were successfully re-mapped along 13 legs of the pre-dredge survey of October 1974. The trailer dredging tracks were locally intense but were well confined to the licence areas. The areas of most intense dredging were filmed. At least two types of suction-head can be identified from their tracks.
5. During each slack water period fish caught by handline provided gut contents for analysis. A total of 164 samples from seven species were preserved.
6. Few Pectinaria and no medusae were observed.
7. Of the two possible DB 1 sites investigated, the site east of the Newcome Sands was shown to be characterised by major sandwaves, while the site off Benacre showed a reasonably plane seabed with good holding ground. Alden records and film of the latter together with grab samples were obtained for Dr Rusby (I.O.S.)

ACKNOWLEDGEMENT:

The topographic mapping of the dredge site involved navigation within unusually narrow limits of position finding and ship's speed over a total period of over 21 hours, mostly in marginal working conditions. The contribution of the ship's staff to the success of this operation is gratefully acknowledged.

SEEN IN DRAFT WG

Robert R Dickson
19 November 1975

INITIALLED AJL

DISTRIBUTION

Basic List

R R Dickson

R S Millner

E G Shreeve

L Woolner

P Hardiman (Burnham)

Mr Edwards (Crown Estate Office)