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REPORT: RV CLIONE: CRUISE 15

•• 、 (PROVISIONAL: Not to be quoted without prior reference to the author) . . . - Carry mill STAFF 1.

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- R R Dickson

R S Millner

T C Doddington E G Shreeve

_____ JR Joyce (NERC) D.N. Langhorne (IOS, Taunton, Part time) . 1

DURATION

Left Lowestoft 0859 h, 16 October

Arrived Lowestoft 0447 h, 25 October

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All times Greenwich Mean Time LOCALITY

Southern North Sea (Southwold-Thorpeness and Longsand Head)

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Mapping of the Southwold-Thorpeness test site using ARL Scanner and Sector Channel recorder

Investigations of sediment transport parameters. 2.

NARRATIVE

CLIONE sailed at 0859 h, 16 October and proceeded to the Southwold-Thorpeness survey area where a Selco marker buoy was moored at 52°17.5'N 01°47.3'E. CLIONE then continued to Harwich to install the dome and to embark Dr Langhorne together with his HiFix unit before returning to the survey area off Southwold. From 0745 h, 17 October a number of cross-tide survey legs were worked in the northwestern part of the area using the ARL Scanner in order to relocate the major gravel ridges observed during CLIONE 5/73 and to set up the Alden sector-channel recorder. At 1538 h, CLIONE anchored close to one of the ridges and measurements of sediment transport parameters began. A shear velocity current meter (SVCM) consisting of 5 S-rotors suspended within 1.5 m of the seabed was used to measure the boundary layer velocity profile at half-hourly intervals and suspended sediment samples were taken (also at half-hourly intervals) from the surface, middle and bottom layers of the water column. Shortly after the start of observations a short circuit was found in the SVCM cable and both Marsh Marine plug sections were repaired (one replaced) overnight. The suspended sediment sampling was

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continued until 0045 h, 18 October. From 0800 h, 18 October SVCM observations were resumed and were continued over the peak of the southgoing tide until 1100 h in conjunction with half-hourly DRCM observations from a fixed depth of 6 m. At that time the SVCM cable again developed a leak and further observations were abandoned. In worsening weather and with no immediate prospect of an improvement CLIONE proceeded at 1245 h to stand by in the Longsand Head area. Between 0730 and 0900 h, 19 October, the HiFix was set up using the Sunk Head Tower as reference and from 1020 h to 1403 h the ARL Scanner was used to carry out repeated surveys along three HiFix lanes, covering ground previously mapped by Dr Langhorne. The Scanner display was continuously recorded on video. Between 1442 h and 1507 h the ARL Scanner and Alden recorder were used to map the seabed topography along six SE-NW HiFix lanes spaced 200 yards apart with the scanner locked on 35°T. These survey legs were laid across a small channel dredged in 1969 through the ridge and sandwave topography of the area. At 1915 h with the mapping completed CLIONE anchored for the night alongside a major isolated ridge at 51°48.1'N 01°36.3'E. From 0515 h, 20 October observations were conducted into the noise generated by this ridge through the movement of sediment by tides. With the ship at anchor polaroids of a constant section of the ridge in vertical scanning mode were taken at 15 minute intervals in conjunction with simultaneous DRCM observations from a fixed depth of 8 m. This study was continued until 1645 h, and at 1715 h CLIONE left the area to land Dr Langhorne and equipment at Harwich before returning to the Southwold-Thorpeness survey area. At 0830 h, 21 October, mapping of this area began using the Scanner and sector channel recorder. The legs were worked cross tide from west to east at 400 yard spacing with the Scanner (in short range and horizontal mode) locked on 200°T. Each leg was laid so as to cover the full width of the proposed dredging area together with the area further east where evidence of dredging activity had been observed during CLIONE 5/73. As in the case of the Longsand Head mapping operation the ships speed was regulated to achieve a speed over the ground of approximately 4 knots resulting in an aspect ratio for the Alden recorder of around 5:1. At 1805 h the survey was halted and CLIONE proceeded to investigate an uncharted wreck between 1830 h and 1915 h before moving inshore to anchor at 1955 h. From 0625 h, 22 October the mapping operation was resumed until worsening weather forced a halt at 1150 h. CLIONE then moved inshore to anchor in the lee of Orford Ness at 1830 h, 22 October. Gale and severe gale force winds prevented further work until 24 October, when mapping of the Southwold-Thorpeness area was continued between 0452 h and 1312 h. The survey was then terminated and between 1353 h and 1455 h a total of eleven grab stations were worked in an area of sandy mud to provide Pectinaria for Mr Joyce. With this work completed CLIONE proceeded to de-dome at Harwich before continuing to Lowestoft, docking at 0447 h, 25 October. 100

RESULTS

1. The near bottom velocity profile was described over the peak flood tide during the spring tide maximum of 17 October.

- 2. Suspended sediment samples from surface, midwater and near-bottom layers were collected throughout this tide.
- 3. The Alden sector channel recorder was successfully used to map the dredged channel off Longsand Head. The major sand ridges which were cut by the dredging of this channel in 1969 had not re-formed though sand waves were present along the floor of the channel.

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- 4. The observations of ridge "noise" conducted on 20 October appeared to show that noise started earlier on the accelerating part of both flood and ebb tidal streams than during the decelerating part. With a DRCM at 8 m depth (relative to the ridge crest at 13 m depth) the noise appeared to begin at a water speed of 25-35 cm/sec on the accelerating phase of flood and ebb, but ceased between 60 and 50 cm/sec on the decelerating phases.
- 5. The Southwold-Thorpeness test site was successfully mapped using the sector channel recorder along 17 survey legs. Time did not permit a full coverage of the seabed but the principal seabed features were adequately described and dredge scars were also mapped. In the area of unauthorised dredging investigated during CLIONE 5/73 (to the east of concession areas 221 and 229) the trailer tracks were predominantly old and ill defined with little evidence of renewed dredging activity. Within the two concession areas themselves some further recent trailer dredging activity was noted together with a small area of anchor dredged pits.

6. Abundant Pectinaria were collected for Mr Joyce.

ACKNOWLEDGEMENT: The success of the mapping exercise was due largely to the ability of the ship's staff to navigate within unusually narrow limits of position and speed for extended periods of time. Their help is gratefully acknowledged.

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Robert R Dickson 19 November 1974.

SEEN IN DRAFT: JRF GFL

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