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

1972 RESEARCH VESSEL PROGRAMME

REPORT: R V CLIONE: CRUISE 6

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

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DURATION

Left Lowestoft 1110 h, 1 May

Arrived Lowestoft 0703 h, 10 May

All times are GMT

LOCALITY

The Shingle banks off Hastings

AIMS

1. To resurvey the area of known dredging activity south of Hastings using the ARL Scanner.

2. With R V TELLINA, to monitor the physical and faunal changes that have occurred subsequent to dredging in a number of pits on the shingle banks, including the experimental pit.

3. To monitor water movements in the bottom of the experimental pit.

4. To evaluate the wind/water drag characteristics of the Lowestoft spar-buoy.

5. To investigate the depth-stability of seabed drifters equipped with acoustic tags by ARL scanner.

6. To test the Lowestoft shear-velocity current meter array.

NARRATIVE

CLIONE left Lowestoft 1110 h, 1 May and proceeded to a location off Harwich where a search was made for the current meter mooring lost during CLIONE 5/72. In calm weather using the ARL scanner without its protective dome a bottom target was observed at the same Decca coordinates as encountered during cruise 5/72. An acoustic target suspended just off the bottom was guided to the bottom target by ARL scanner and released from the Z-boat. Subsequent diver inspection

showed the bottom target to be a large isolated boulder and with no other targets in the immediate vicinity the search was abandoned.

CLIONE proceeded to Boulogne for installation of the scanner dome before continuing to the survey area off Hastings where a rendezvous was made with TELLINA at 1130 h, 2 May. Using the ARL scanner a search was immediately made to find and buoy the experimental pit dredged in July 1971. This search was hindered by the presence of apparently fresh holes dredged since the survey of July last year, and the first hole to be marked by a dahn was shown by diver inspection not to be the experimental pit.

Between 1508 h and 1726 h, 2 May the seabed in the area of proved dredger activity was surveyed by ARL scanner. Six north-south survey legs each 1½ nmi long were worked at 200 yd spacing with the scanner locked due west as in previous surveys of the area. The scanner display was filmed continuously. The complex of dredged pits was again encountered as on CLIONE cruises 15 B/70, 2A/71 and 8A/71 and, as on these earlier cruises, it was possible to make a positive identification of certain distinctive pits including a clover-leaf shaped pit with a trailer dredger-trench running from it towards the north. On completion of the survey dahns, with near-bottom acoustic targets were guided into the clover leaf hole and one other pit by ARL scanner and released from the Z-boat. At 0720 h, 3 May CLIONE anchored alongside the first pit to be marked and the divers were sent to assist TELLINA in her grab survey of the three marked pits. Despite calm weather it proved extremely difficult for TELLINA to obtain uncontaminated grab samples of infill material and these were therefore supplemented by samples obtained by divers. Aboard CLIONE, the Lowestoft spar-buoy was rigged from the stern for tests of drag characteristics using the 200 lb load-cell, and in calm conditions an excellent continuous analogue record of water-drag was obtained from 1010 h to 1640 h, 3 May. A DRCM deployed amidships at 5 m depth was used to monitor water movements during this period. One of the ARL scanner downlock rams was found to be corroded and leaking hydraulic fluid; it was removed and its hydraulic lines blanked-off. Between 1752 h and 1920 h, 3 May the three dahns were recovered, two new pits were located and buoyed, and after assisting a small fishing vessel with an engine breakdown CLIONE anchored inshore at 2045 h.

Beginning 0800 h, 4 May CLIONE continued her search for the experimental pit. The first attempt (am) was shown by diver inspection to have been unsuccessful. The divers then continued to assist TELLINA's sediment sampling programme while CLIONE located a further pit. After a brief interruption due to bad weather a dahn was located in the pit and divers were then able to confirm its identity and to make a preliminary inspection of the experimental pit. Using the ARL scanner in vertical mode the maximum depth of the pit was estimated at 5.1 metres. The scanner showed no sign of the four acoustic targets laid around the pit in July 1971 to act as measurement base-points. Beginning 0730 h 5 May, four new acoustic targets were guided into position using the scanner and released from the Z-boat. A pallett-mounted Plessey meter was then located on the base of the pit by divers.

At 1300 h with diving no longer possible due to tide, CLIONE began tests of the depth stability of a seabed drifter equipped with an acoustic tag. A shallow water current meter mooring was laid (Plessey meter at 10 m depth) to monitor water movements during the tests. From

1345 h to 2030 h, 5 May an accurately weighted standard drifter (1 gm net negative buoyancy) was tracked and filmed continuously using the ARL scanner in vertical mode. The bottom temperature and salinity were measured at the close of the test, and CLIONE then anchored inshore at 2115 h.

During the morning dive on 6 May divers obtained 4 bulk sediment samples from the experimental pit for TELLINA and a general reconnaissance of the pit was made. The path of each diver around the pit was monitored and filmed on the ARL scanner to fix the locations of sampling. The replacement scanner downlock ram, received via TELLINA on 5 May, was fitted. During the evening dive the pallett-mounted current-meter was recovered from the pit and strings were stretched across two diameters of the pit between opposed pairs of acoustic targets. Again these operations were monitored and filmed on the scanner display. CLIONE then weighed anchor at 1940 h, 6 May, to pick up the shallow-water mooring before proceeding overnight to a survey area south of Nab Tower in response to a request from the laboratory. Three buoyed pits were left to permit the continuation of TELLINA's grab-sampling programme in the absence of CLIONE.

Beginning 0755 h, 7 May the Nab Tower area was surveyed along 21 north-south survey legs each 2-3 n mi in length and set 500 yards apart. The scanner was locked due west and filming of the display was continuous. At 1705 h, 7 May the survey was completed and CLIONE anchored until 2259 h before continuing overnight to the Hastings survey area.

Thick fog in the early morning of 8 May prevented diving until 1300 h when divers measured and profiled across the two diameters of the experimental pit. One further bulk sediment sample was obtained. During this dive, the Lowestoft shear velocity current meter array was rigged and lowered for tests; starting at 1500 h, half-hourly measurements with the 5-rotor array were made until 1800 h when a 40 knot squall forced an end to diving and velocity-shear measurements. CLIONE weighed anchor to pick up the 3 dahn markers and at 1915 h, 8 May left the Hastings survey area to resume the search for the lost current meter mooring off Harwich.

Arriving in the search area at 0930 h, 9 May a second bottom target was located using the ARL scanner and in worsening weather an acoustic target was guided onto the bottom target by the scanner and released from the Z-boat. A dive at 1430 h revealed the bottom target to be a mine and the search was abandoned at 1515 h.

CLIONE then proceeded to the area of the Shipwash L V and a second standard seabed drifter (1 gm net negative buoyancy) equipped with an acoustic tag was tracked over the peak of the tide until 1736 h. CLIONE then continued to Harwich to de-dome, docking at 2000 h. Using a reversing water bottle, water samples were obtained from the upper and lower levels of the scanner tube before removal of the dome. At 2253 h, CLIONE left Harwich and proceeded to Lowestoft, docking at 0703 h, 10 May.

Dome distance this cruise - 426.5 n mi
Total dome distance - 1022.5 n mi

RESULTS

1. The results of CLIONE cruise 8A/71 showed that bottom shear stress (even at spring tides) was incapable of moving bed material in the test area off Hastings. The current cruise confirmed this result in showing no noticeable infill of the experimental pit since July 1971. In fact the thick mud silt ooze which formed the floor of the pit immediately after dredging in July 1971 has compacted to a hard bed and the floor of the pit has been lowered by over 1 metre as a result. The pit now has a maximum depth of 5.2 m (diver profiling and vertical mode scanner estimation) compared with 3.9 m (diver profiling) in July 1971.

2. Slumping of the pit walls subsequent to dredging has slightly widened the diameter of the experimental pit and has somewhat reduced the area of the mud floor. Measurements across two diameters of the pit in July 1971 and May 1972 are as follows:

	July 1971	May 1972
Diameter 1	27.3 m	29.2 m
Diameter 2	28.1 m	32.4 m

3. The clover-leaf hole-trailer track complex has persisted since at least December 1970 when it was first surveyed by CLIONE. The continued persistence of the trailer track to date is a further indication of the lack of sediment movement in the area. This feature was measured by divers in July 1971 as 6-12 inches in depth.

4. The acoustic tagged standard seabed drifter tracked off Hastings on 5 May remained hard on the bottom during the whole of the tracking exercise which included a tidal maximum (ca 66 cm/sec). The second drifter tracking exercise off Harwich took place in a local tide-rip in which CLIONE manoeuvred to the drifter only with difficulty. Because of this, the drifter proved difficult to hold in vertical scan at peak tide, but during limited periods when this was possible the drifter showed clear evidence of drift-off from the bottom. No current measurements were possible at this time and it remains to future cruises to establish the threshold current speed responsible for lift-off.

5. The maximum observed water drag of the Lowestoft spar buoy was 45 lb in a current speed of 66 cm/second.

6. The southernmost two-thirds (approx) of the Nab Tower survey area proved to be smooth and featureless, suggesting gravel or shingle, while the northernmost third was broken ground with some evidence of rock outcrops. No recent dredging has taken place in this area. A detailed chart is being prepared.

7. 10 whiting, 10 pout-whiting and 10 assorted dogfish were frozen whole for Dr Portmann (Pesticide residues/heavy metals analysis).

(Results of the faunal/sediment survey at Hastings will be described in the report of TELLINA 4/72)

R R Dickson
23 May 1972

SEEN IN DRAFT: J R French

INITIALLED: AJL

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