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

1970 RESEARCH VESSEL PROGRAMME

REPORT: RV CLIONE: CRUISE 7

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

STAFF

1. F R Harden Jones
2. P G Griffiths
3. B K Clarke
4. M Greer Walker
5. T Storeton West
6. M G Pawson (NERC)
7. C C Hemmings (Aberdeen)
8. R Cloet (NERC, Coastal Sedimentology )
9. N Kenyon (NIO)

DURATION

Left Lowestoft 1000 hours 5 May
Arrived Lowestoft 1400 hours 27 May
All times are British Standard Time

LOCALITY

Suffolk coast - Bristol Channel

AIMS

Part 1a. Provide facilities for BBC camera crew.

1b. Carry out trials with acoustic tags in the Lowestoft-Harwich area.

Part 2. Follow the movements of fish shoals in relation to tidal streams in the Bristol Channel area.

Part 3. Survey areas of geological and biological interest from the Bristol Channel to the Southern Bight of the North Sea.

NARRATIVE

Part 1. CLIONE sailed from Lowestoft at 1000 hours on 5 May with Harden Jones and the BBC camera crew on board and joined CORELLA near Sizewell Bank. After the BBC had completed their work CLIONE entered Harwich at 1830 hours. Staff members 2-5 joined the ship. The dome was fitted, and the BBC filmed this and other activities concerned with sector scanning. The camera crew left the ship at 2100 hours, and CLIONE sailed from Harwich at 2400 hours to anchor off Felixstowe. Acoustic tag trials were carried out in this area from 6 to 8 May. On 8 May Dr Haslett, Mr Pearce, and Mr Ellis (Kelvin Hughes) came out by pilot-boat to join the ship for a few hours work with the sector scanner. CLIONE returned to Harwich at 1930 hours 8 May, when the dome was removed. Greer Walker, Storeton West, and the Kelvin Hughes party left the ship and Pawson

joined. CLIONE left Harwich at 0900 hours 9 May on passage to the Bristol Channel.

Part 2. CLIONE anchored off Falmouth at 1540 hours on 10 May (a Sunday), entering the port next day to fit the dome. At noon CLIONE left Falmouth for the Bristol Channel where work started early on 12 May and continued until 19 May. During this period fish shoals were tracked with the sector scanner when the ship was anchored or steaming, water current estimates being made from DRCM profiles or the movement of a drogue respectively. Many aspects of behaviour were studied and special surveys were made at selected areas at sunset. Bathythermograph lowerings were carried out every day. Dr Hemmings and Dr Cloet joined the ship on 14 May, the latter leaving on 16 May. Very good weather conditions enabled the work to be completed ahead of schedule, and after landing Hemmings and Pawson at Newquay on 19 May, CLIONE left the Bristol Channel area to enter Falmouth at 0830 hours on 20 May. The dome was removed and after minor repairs, replaced. Mr Kenyon joined the ship that afternoon.

Part 3. CLIONE left Falmouth at 0800 on 21 May and steamed eastwards up channel. Areas of geological interest were surveyed on passage or by box grid: a number of reported wrecks were surveyed at the request of Hydrographer; and sprat shoals around the intake of Dungeness A nuclear power station examined. CLIONE reached the Sandettie-Ruytingen area at 2300 hours on 23 May. Sand wave surveys, sediment transport, and bottom noise surveys were carried out in the area. Work finished on the 25 May and CLIONE entered Boulogne late that evening. The dome was removed and the ring fitted. Mr Kenyon left the ship the following day. CLIONE sailed from Boulogne at 1600 hours on 26 May, to arrive at Lowestoft at 1400 hours on 27 May.

RESULTS

The weather throughout the cruise was exceptionally good. No working time was lost. Subject to a more detailed analysis of the data, the following results are noted:-

1. Signals from the acoustic tag were detected up to ranges of nearly 180 m.

2. Fish shoals tracked in the Bristol Channel area invariably moved downstream with the tide.

3. Mackerel (identified by rod and line fishing) formed sheets in the surface layers, their depth being close to that of the thermocline. Fish caught were feeding heavily. The sheets of mackerel moved downtide in 'extended-order', at a speed faster than that of the tide as measured by DRCM or a drogue.

4. The mackerel were patchy in their distribution; successive but discrete waves of fish - separated by about 1000 m - passed CLIONE at anchor or when drifting with the tide.

5. It was found practicable to track a drifting drogue target and to follow fish shoals, the position of the target and the shoal being referenced to CLIONE'S decca position. This work was carried out using the active rudder without interference to the sector scanner.

6. Two large (10-20 m) "single" targets were tracked for short periods.

One moved across tide at 2-3 knots, the other very slowly.

7. Mackerel shoals joined with other similar shoals, presumed to be mackerel. But they showed a vigorous and characteristic escape reaction when within 10-20 m of the drogue target. Both the escape reactions and subsequent behaviour of the fish were recorded. On one occasion a shoal made a similar escape reaction when approached by a strong single target (possibly a spurdog or nursehound). Analysis of the data should provide estimates of sighting ranges and burst escape speeds.

8. Of 6 wrecks noted by Hydrographer, two could not be located in their reported position. An area marked 'foul' off Start Bay was identified as a battleship (possibly FORMIDABLE); a wreck thought to be buried near the Shambles was detected; a four engined bomber was located off Shoreham away from its reported position; the coaster SIERRA BRAVO (sunk 12 April 1970) was found off Dungeness; and, - a bonus - the unrecorded wreck of a naval boat located a little to the north east of the coaster. This work was carried out with only minor alterations to the ships main work and each survey was completed in less than 1 hour.

9. Shoals, possibly sprats, were present in the Dungeness area, and were relatively abundant in water over 10 fm a few hundred metres from the power station intake. In the deeper water the shoals were, during the day, positioned in midwater at depths between 5-10 fm, and were therefore below the level of the intakes which appear to start about 2 fm above the bottom in a depth of 6 fm. But the sector scanner, used in vertical mode at long range, showed that in the shallower water there were small shoals higher in the water and thus above the level of intakes. One shoal was observed within 50 m of the intake structure.

10. The noise survey in the Sandettie-Ruytingen area showed that relatively large sandwaves (3 or 4 fms or more in height) were associated with noise. One sandwave kept under surveillance during a 12 hr period produced no detectable noise when the NE tide was below 45 cm sec. Other sandwaves were 'noisey' at lower water velocities, but most were noise free at flows less than 20 cm sec. As sand waves are generally found close to the banks rather than in the channels between the banks, the channels themselves would be expected to be noise free. A survey across the Sandettie-Ruytingen channel confirmed this. But a noisey area was found to the west of a line joining the Sandettie and Ruytingen buoys. Many of these noise sources could be referred to large sand waves in the area, but there were two noisey patches where the bottom appeared to be free from sand waves high enough to be recorded on an MS 29.

11. At an anchor station on the northern edge of the Outer Ruytingen, a few small shoals were seen to "roll-and-bounce" about the bottom. This occurred at slack water. The shoals were scintillating, tightly packed spheres, a few metres in diameter, and were generally moving on or very close to the bottom. Three were tracked and all moved with the weak 10-15 cm tide.

12. Reliability of equipment

a. The sector scanner and the stable platform were used for 193 working hours. Less than 2 hours were lost due to minor faults (earthing troubles, dry joints), amounting to 1.0% of working time.

b. The dome cover, previously used in cruise 6, was in very good condition when the dome was recovered in Boulogne and only minor patches and stitching are required. This cover has now given service for 1239.8 n. miles, admittedly under good conditions.

13. The BBC's work was shown in "To-Morrow's World" 27 May.

F R Harden Jones
29.5.70

SEEN IN DRAFT: M R Sutcliffe (Master)

A H Button (Fishing Skipper)

INITIALLED: DHC

DISTRIBUTION

Basic List

F R Harden Jones
P G Griffiths
B K Clarke
M Greer Walker
T Storeton West
M G Pawson (NERC)
C C Hemmings (Aberdeen)
R CLoet (NERC, Coastal Sedimentology)
N Kenyon (NIO)