Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: RV Squilla
(Marine Biological Association, Plymouth)

CRUISE LOCATION: West Solent

CRUISE PERIOD: 25-30 June 1981

PERSONNEL:
D N Langhorne (Senior Scientist)
R A Haine
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A A Read

OBJECTIVES: To measure the threshold and rates of movement of gravel in relation to boundary layer tidal flow (DOE Commission, No S26).

PROCEDURE AND METHODS: Following extensive surveys of sea bed morphology (MV John Stephenson, 26-30 January 1981) and sediment distribution (MV Wessex Explorer, 15-20 March 1981) experiments were carried out in specific locations in Yarmouth Roads to observe and trap mobile gravel and at the same time record velocity profiles in the boundary layer. A special bottom rig was designed and built to carry 4 Ott velocity sensors, at heights of 10, 22, 46, 100 cm above the sea bed; TV camera (RT Labs SIT camera); and sediment trap.

In order to hold the ship at anchor a 5 CWT anchor was carried and deployed from the stern gantry. After deployment the anchor wire was transferred to the bow. No secondary anchors were used. Horizontal position control was by Decca Trisponder with remotes at Lymington yacht staging and Yarmouth Pier.

EQUIPMENT PERFORMANCE: 1. Ott velocity meters: On the first deployment three out of the four meters failed to work. This was found to be due to ingress of water into the cable glands. These were resealed and no further trouble was experienced. The experiments were hampered by the large quantities of drifting weed. This made it necessary to raise the rig and clear the rotors at frequent intervals.

2. TV: Good results were obtained without the need to use lights. Marked corrosion occurred on the camera casing.

3. Sediment trap: It was necessary to put a large tail fin onto the rig to improve orientation. Certain redesign requirements of the prototype are required to overcome recirculation within the trap and reduce erosion at the sidewalls.

4. Trisponder: Good.

EQUIPMENT PERFORMANCE: (Contd)

5. Ship; anchording performance: Initially the ship was anchored from the Starboard quarter using the 5 CWT anchor. This proved to be unsatisfactory particularly when lying in a cross wind. The method was changed by transferring the anchor cable to the bow, but with no winch or capstan facilities on the bow, this meant that the ship's position could not be changed by adjusting the cable. When anchored from the bow, no stern anchors were used.

RESULTS:

Good boundary layer velocity profiles were obtained for most of the cruise. The results were only interrupted by drifting weed. Observation of gravel movement and trapping was very dependent upon the rigs position on the gravel bedforms. Significant gravel movement appeared to be restricted to the crestal areas of gravel waves. In such areas, at high flow velocities, all the gravel particles moved, regardless of grain size.

ITINERARY:

24.6.81: RV Squilla sailed from Plymouth for Yarmouth with an overnight stop at Weymouth.

25.6.81: IOS staff travelled to Yarmouth. Set up equipment on board and Trisponder remote stations.

26.6.81: Sailed 0830. Anchored in area of large gravel waves ($\lambda \simeq 15$ m). Conducted gravel mobility studies. Returned to Yarmouth Pier 1900.

27.6.81: Sailed 0700. Continued studies. Berthed 1930.

28.6.81: Sailed 0730. Continued studies. Berthed 2000.

29.6.81: Sailed 0800.AM Continued studies in area of large gravel waves. PM re-anchored in area of featureless gravel. Berthed 1930. Off loaded equipment and dismantled Trisponder remote stations.

30.6.81: RV Squilla sailed for Plymouth. IOS staff returned to Taunton.

PREPARED BY: (D N LANGHORNE)

APPROVED BY: (K R DYER)

DATE: 8 July 1981