

I.O.S.

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(BIDSTON)

RV EDWARD FORBES CRUISE 13/75

29 JULY 1975 TO 5 AUGUST 1975

SEDIMENT MOBILITY IN SWANSEA BAY

CRUISE REPORT NO 36

1975

INSTITUTE OF  
OCEANOGRAPHIC  
SCIENCES

NATURAL ENVIRONMENT  
RESEARCH COUNCIL

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Institute of Oceanographic Sciences  
Crossway  
Taunton  
Somerset

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SCIENTIFIC PERSONNEL

IOS

R Gleason (Senior Scientist)

K A Reeves

T Upham

J Humphery

P Arrigoni

IMER

R Warwick

J Davies

R Price

SHIP'S OFFICERS

Captain: B Chapman

1st Mate: T Moores

2nd Mate: J Price

Chief Engineer: J Richardson

## OBJECTIVES

The objectives of the cruise were threefold:

- (i) To obtain data on the mobility of sediments in the southern area of Swansea Bay by monitoring the areal distribution of the radioactive tracer introduced in May; by taking water samples from the surface, mid-water and bottom of the water column and by measuring the current velocity profile at separate stations.
- (ii) To deploy and service wave recording equipment.
- (iii) To search with the side scan sonar for two missing wave recorder rigs and also using the sonar to continue mapping the seabed sediments and dynamic features.

## NARRATIVE

- 29 July The first day of this cruise was spent in travelling to Swansea Bay and deploying the self-contained wave recorder near Port Talbot (see chart, figure 1). The mooring configuration shown in figure 2 was used as an improvement on that previously used in this area for the two wave recorders that have been lost. The last four hours of the day's cruise were given to R Warwick of IMER to carry out benthic fauna sampling in Swansea Bay, his previous cruise having been prematurely terminated due to bad weather.
- 30-31 July The second and third days were used to search for the radioactive tracer that had been injected onto the Kenfig Patches in May and plot its dispersion. The sample points were taken at the intersection of even lanes on the Swansea HiFix Chain.
- 1 August The following day, owing to illness of one of the IOS staff, the cruise was interrupted and the vessel returned to Barry at 0800 to obtain medical advice and to take on water. This only meant the loss of approximately four hours, ie one morning's work, as it had been planned to take on water that afternoon and give the crew a rest period in Barry.

- 2 August      The ship set sail for Swansea at 1030.  
                 Whilst returning to Swansea Bay checks made on the EG & G  
                 dual side scan showed that only the starboard transducer was  
                 functioning. Attempts were made to trace and rectify the  
                 fault, but this only succeeded in the loss of transmission  
                 from both transducers.
- 3 August)      Therefore the remaining time on that day and the following  
4 August)      two days was used to take current meter readings and water  
                 samples for suspended sediment analysis.
- 5 August      The final day of the cruise was used to deploy a new  
                 wave-rider buoy and mooring east of the Scarweather Light  
                 Vessel and retrieve the old system. This task was  
                 successfully completed and the ship returned to Barry.

#### DISCUSSION AND RESULTS

All current measurement stations, wave recorder sites and the radioactive tracer injection site are shown on the attached chart.

Radioactive Tracer:    685 gm of Scandium 46 labelled glass with an initial activity of 20 curies had been deposited on the Kenfig Patches in May. Two subsequent searches in early June and July had shown an initial rapid dispersion of some of the tracer. The bulk appeared to remain stationary. The latest search suggested a broadly similar pattern with an overall reduction in area. The surrounds to the area were covered on a broad grid to confirm that activity outside the tracer conformed to the levels obtained prior to injection.

Current Meter and suspended sediment sampling:    The Braystoke meter readings were taken for a thirteen hour period at each of the sites B, C and G (shown on the attached chart).

The current velocity and direction readings were taken at 2m intervals and 1m above the sea bed every half hour. The suspended sediments were sampled using NIO water bottles every hour at levels of 2m below the surface, mid-water and 1m above the bottom. All the data and samples are now at Taunton being analysed.

STATION LIST

Injection site for radioactive material      51°30.2'    3°48.6'

Current Meter and Suspended Sediment Sampling Stations

B      51°32.9'      3°47.6'

C      51°29.5'      3°47.5'

G      51°35.1'      3°52.4'

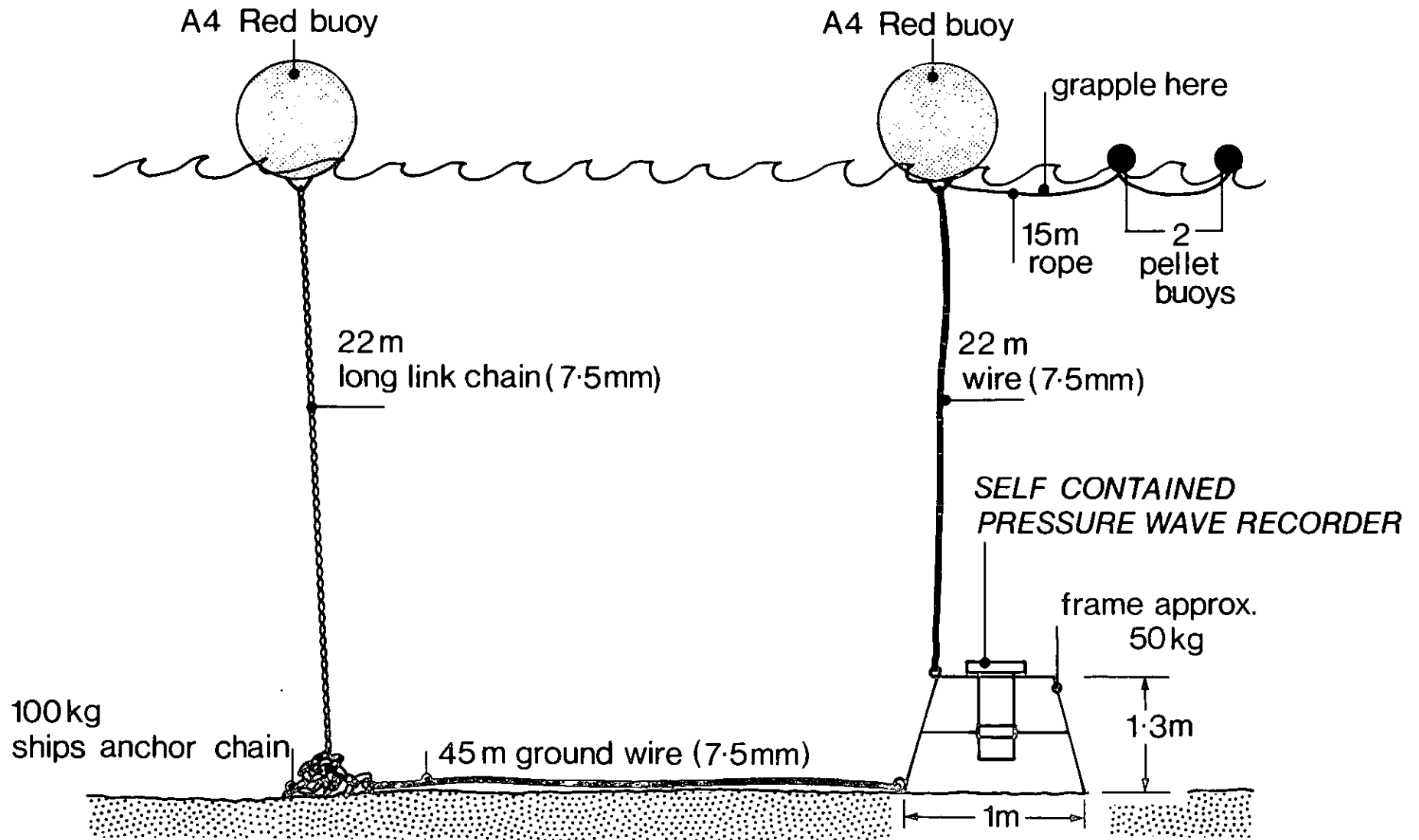
Self-contained pressure wave recorder      51°33.7'    3°48.2'

Waverider Buoy      51°26.8'    3°54.7'

R Gleason







WAVE RECORDER MOORING

Figure 2