Natural Environment Research Council

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

PROVISIONAL CRUISE REPORT

VESSEL M.V. DEVONIAN

CRUISE PERIOD 31 August - 15 September 1979

PERSONNEL

D.N. Langhorne	SSO (Senior Scientist)
A.J. Marks	SSO (Electronics and Diving Team)
E.J. Moore	HGCD (Diving Team Leader)
J.D. Humphery	HSO (Diving Team)
P.M. Hooper	SO (31.8 - 4.9.79 and 14.9 - 15.9.79)
I.J. Hayes	ASO (Diving Team)
N. Dillon	ASO
C. Wooldridge)	Cardiff University 13.9.79 only
I. McCallum)	

ITINERARY M.V. Devonian operated on a day running basis from Dartmouth.

31st Aug.	Set up equipment on board M.V. Devonian and Trisponder remote stations at Start Point lighthouse and Strete. The diving team proceeded to the reasearch area to set up sea bed reference stakes.
1st Sept.	0800 -2100 a) laid self recording current meters (2) b) Carried out routine diver measurements c) Tested the system of (EPROM) self recording stakes.
2nd Sept.	0800 - 2000 Adverse sea conditions. Operations restricted to setting up EPROM stake line across the crest of the sandwave and testing diving equipment off Hallsands.
3rd Sept.	0800 - 1830 a) Routine diver measurements b) Echo-sounding and sidescan sonar survey.
4th Sept.	0800 - 1800 a) Routine diver measurements b) Echo-sounding and sidescan sonar survey.
5th Sept.	0730 - 2100 a) Routine diver measurements b) Tested underwater T.V. system c) Carried out checks on interference in Trisponder system.
6th Sept.	0800 -2400 Fog during the morning a) Routine diver measurements b) Fluorescent dyed sand emplaced on the crest of the sandwave at midday slack water (end of Flood tide). Night dives using underwater Ultra-violet light to track tracer plume.
7th Sept.	0800 - 2045 a) Routine diver measurements b) Tracer experiments c) Relaid ship's moorings
8th Sept.	0800 - 1930 a) Routine diver measurements b) Set up lighting system for EPROM stakes.
9th Sept.	0800 - 2015 a) Routine diver measurements b) Sidescan sonar survey of sandwave crest line.
10th Sept.	K.R. Dyer and J. Futcher joined ship as day visitors. 0930 - 2030 a) Routine diver measurements b) Echo-sounding survey, poor results due to Trisponder interference c) Sidescan sonar survey of sandwave crest line.
11th Sept.	0800 - 2130 a) Routine diver measurements b) Ripple movement studies using underwater T.V.

	12th Sept.	0700 - 2130 a) Routine diver measurements. b) Underwater T.V. studies of ripple movement.
	13th Sept.	0800 - 1800 a) Routine diver measurements b) Carried out trials with Cardiff University underwater towed vehicle.
	14th Sept.	0800 - 1800 a) Routine diver measurements b) Sidescan sonar and Echo-sounding survey.
	15th Sept.	0800 - 2000 a) Routine diver measurements b) Recovered self recording current meters. c) Recovered ship's moorings d) Sidescan sonar survey of the sandwave area.
	16th Sept.	Removed equipment from M.V. Devonian and IOS staff returned to Taunton.

OBJECTIVES

a) To continue the study of sandwave movement and sediment transport in relation to hydrodynamic conditions.
b) To continue the AUWE contract.
c) To test a system of self recording (EPROM) stakes.
d) To carry out trials with the Cardiff University underwater towed vehicle.

PROCEDURE AND METHODS

a) A line of sea bed reference stakes was set up crossing the sandwave crestline at right angles (see Fig. 1). Using these stakes divers could obtain routine measurements of the movement of the crest of the sandwave over a Neap/Spring/Neap tidal period. Tidal flow was measured using 2 self recording current meters placed 1 m above the bed on the crest of the sandwave. Sediment dispersion from the crest of the sandwave was measured using fluorescent dyed sand and an underwater Ultra-violet light. Dune movement, on the flanks of the sandwave, was measured using sidescan sonar. Echo-sounding and sidescan sonar surveys were conducted to study the stability of the larger sandwave area.
b) Observations were made with reference to the AUWE contract.
c) A system of self recording (EPROM) stakes was set up parallel to the sea bed reference stakes. These were observed on a routine basis by divers and records made upon their levels of exposure.
d) The Cardiff University underwater towed vehicle was tested by the IOS diving team. The vehicle manned by two divers was towed at slow speed and tests were carried out upon its manoeuverability.

EQUIPMENT PERFORMANCE

a) Initial difficulties occurred with the provision of the necessary power supplies for the equipment viz: Trisponder, 24 V D/C (from ship's batteries). Sonar, 24 V D/C (via power pack from generator). Mutual interference occurred between the Trisponder and the Sonar if run from the same power supply when the sonar transducer was used in a hull mounted mode. Echo-sounder, 12 V D/C (from Battery).

Underwater T.V., 240 V A/C (from Generator).
b) Considerable interference occurred on the Trisponder. However, it was known that another vessel was using a Trisponder system to the S of Start Point.

RESULTS

The cross sectional profile of the crest was obtained over a period of 15 days which covered a Neap/Spring/Neap tidal period. During this time tidal flow data was obtained from two self recording current meters. Twice daily diver inspection ensured that weed fouling was kept to a minimum. In addition divers were able to measure the height of the flow sensor above the sea bed. This height was initially set to be 1 m, but changed during the observational period. Fluorescent dyed sand was used to measure the dispersion of sand from the sandwave crest for the period of a single ebb tide.
Only poor quality data was obtained from echo-sounding and sidescan sonar surveys because of low geared steering on Devonian (hence difficulties in maintaining a steady track) and interference on the Decca Trisponder position fixing system.
Continuous wave data was obtained throughout the cruise period.
The EPROM stakes failed to operate because of ingress of water through the resin potting.

PREPARED BY :

APPROVED BY :

DATE : 10 March 1980

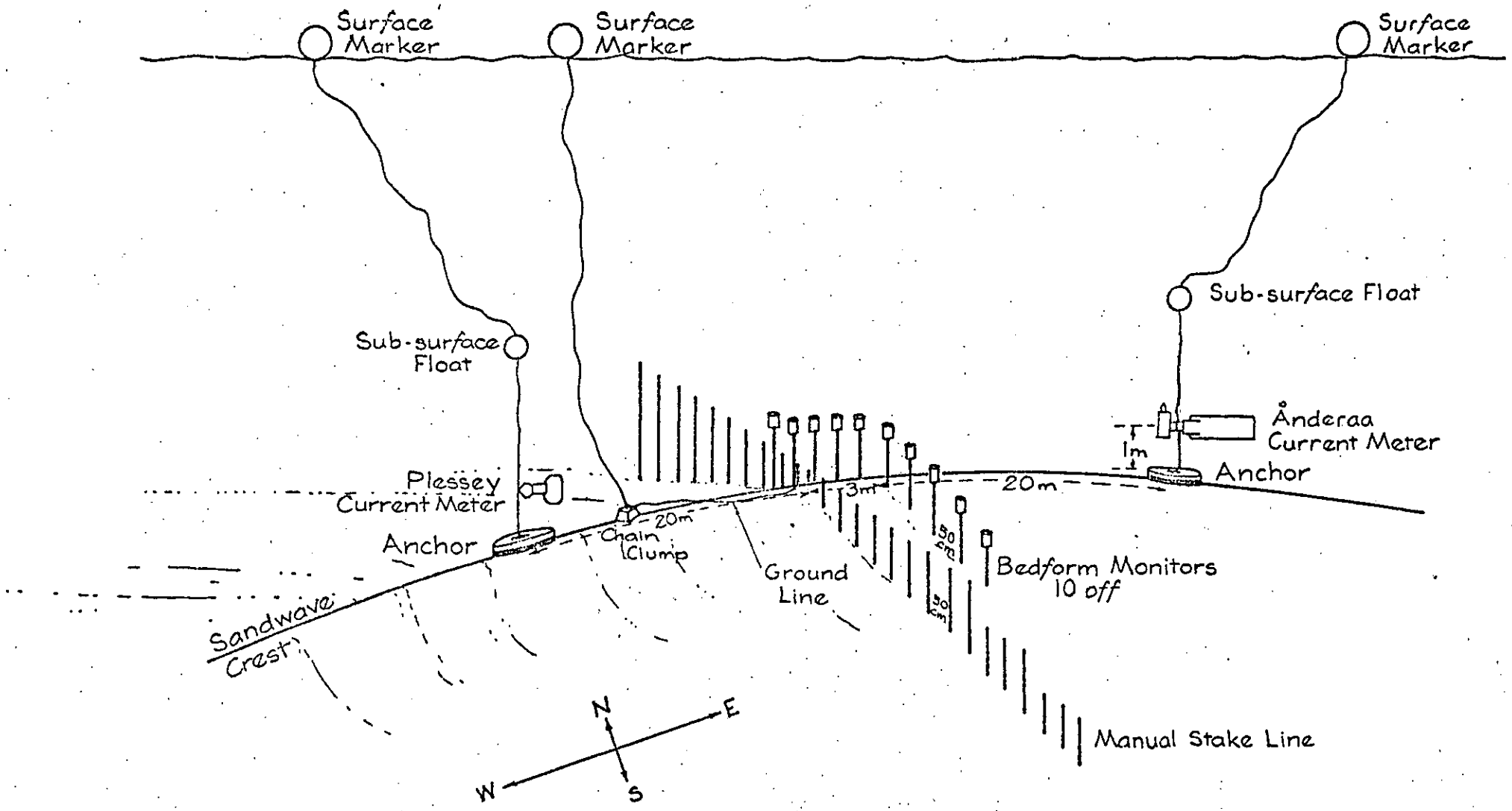

Diagram of Main Work Area. Devonian Cruise. September 1979.

FIG 1

CONFIDENTIAL REPORT ON THE SUITABILITY OF M.V. DEVONIAN

OWNER	J. McGuire, 5 Swan Court, Dartmouth.
CHARTER	£180/day (plus mooring fees at Kingswear jetty).
VESSEL	72 ft, single screw fishing boat.
COMMENT	The vessel is generally suitable for day running operation in Start Bay. The level of cooperation from the owner is good. He has had a lot of experience with working with divers and is a good seaman. If problems are identified he is generally able to improvise. and on one side of paper, The vessel is comparatively cheap and provides adequate working space. Its limitations are: a. Little available A/C power. It is therefore necessary to provide ones own generator. b. Over the side lifting gear is manual. c. Low geared steering. Therefore it is difficult to maintain a steady course through turbulent flow over the crest of a sandwave.