

PROVISIONAL CRUISE REPORT

VESSEL: MFV Devonian

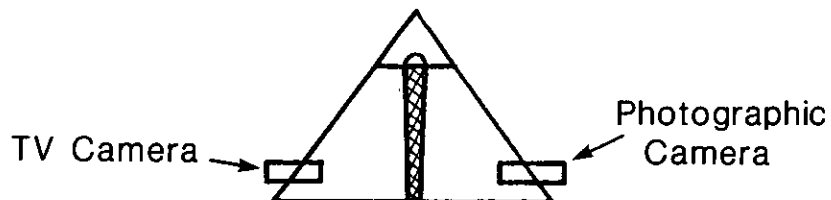
LOCATION: Between Dartmouth and Mevagissey

CRUISE PERIOD: 11 April - 14 April 1981

PERSONNEL: R H Wilkinson Principal Scientist
E J Moore Diving Officer
J D Humphery)
A J Marks) Diving Team
P D Bird (Contract))

OBJECTIVES Wave boundary layer flow visualization by time exposure photography of neutrally buoyant particles oscillating near the sea bed under the action of surface waves in the absence of significant tidal current. It is intended to deduce near-bed velocity profiles from the photographs.

PROCEDURES AND METHODS: A light weight pyramidal frame, holding a TV camera, photographic camera and lights mounted in a parabolic reflector, is lowered



to the sea bed and oriented by divers so that the oscillatory water motion is perpendicular to the optical axis of the cameras. The parabolic reflector produces a fan of light, so that only the particles in this plane are visible, and so measurements can be taken from a single photograph. Neutrally buoyant particles (chopped polystyrene rod) are introduced into the flow in small quantities by the attendant divers. The TV camera is then used as a viewfinder and, when the particles are suitably distributed, time exposure photographs are remotely triggered on the camera.

EQUIPMENT PERFORMANCE: Two malfunctions caused delay:

i) a clear plastic mounting plate in the U/W casing for the photographic camera stripped a thread, rendering the casing not watertight. A replacement plate was made the following day at Fort Bovisand.

ii) The focussing system of the TV camera ran off its adjusting screw. The gears were re-engaged after advice from the laboratory, and this part of the focussing range was then avoided.

RESULTS

No time exposure photographs of the neutrally buoyant particles were obtained, but the following conclusions can be drawn:-

i) As anticipated, easterly winds do not produce suitable waves for this experiment within practical reach of Devonian from Dartmouth.

ii) of the sites investigated, Whitesand Bay (4) appeared to have the most suitable bottom, which was a fine to medium sand with very little mud to reduce visibility. Westerly or south-westerly waves are needed for this site.

iii) The rig handled well and Devonian is a most suitable vessel from which to do this experiment. The parabolic light appears very satisfactory.

iv) The experiment is basically a laboratory type technique taken into the field. As such, the required conditions of waves and visibility are quite critical. However, the results obtained would be quite unique and their potential justifies at least another attempt.

ITINERARY:

11 April Loaded and assembled scientific equipment at Kingswear Jetty. Sailed 1100 hrs. Investigated sites at Bolt Head (1) and Bolt Tail (2), but could find no suitable sandy bottom with sufficient sea room. Very suitable conditions found in Wembury Bay (3). Equipment failure led to abandonment of experiment. Put into Plymouth for repairs.

12 April Equipment repaired at Fort Bovisand workshops. Proceeded to Wembury Bay (3). Arrived on station at 1400 hrs. Visibility deteriorated drastically, which was confirmed by divers. Focussing mechanism on TV camera failed. Put into Plymouth for repairs.

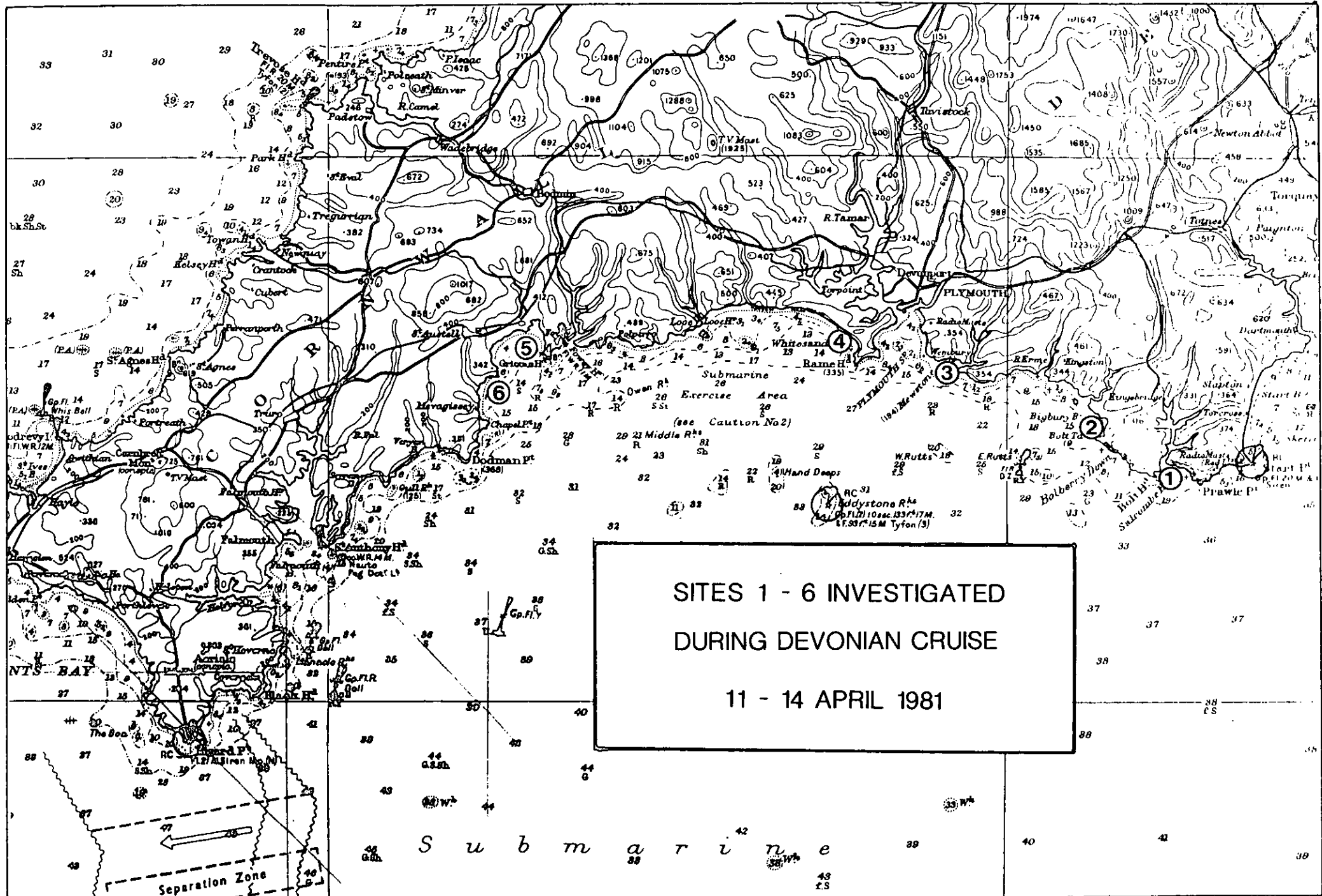
13 April Set sail at 1200 hrs after effecting repairs to TV camera. Investigated site in Whitesand Bay (4). Very good visibility, no evidence of mud, but no wave activity due to lee. Put into Fowey because of gale warnings.

14 April Wind dropped but waves still running. Sites in St Austell (5) and Mevagissey (6) Bays investigated. Visibility very poor (< 1 m). Returned to Dartmouth.

PREPARED BY: R H Wilkinson

APPROVED BY: K R DYER

DATE: 8 May 1981



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