VESSEL: M V Gardline Locater

CRUISE PERIOD: 30 August-26 September 1978

PERSONNEL: IOS and collaborating Scientists:

Dr W R Parker - Senior Scientist
Dr G C Sills, Oxford University - Senior Scientist
Dr R Kirby - Scientist I.C. Deck
Dr A P Salkield - Scientist I.C. Instrumentation
Mrs C A Kirk - Data Analysis Supervisor
Mr M R Lees
Mr G P Le Good
Mr M A S Moore
Dr T J Smith
Mr N Dillon
Mr S Edmeades
Miss J Blower
Mrs J Wolff, IOS Bidston
Mr R Bryant - Swansea University
Dr A E James - " "
Dr A Roche - " "

VISITING SCIENTISTS: Professor E Partheniades, University of Florida
Ir W Vlemmix, Netherlands Rijkswaterstaat

ITINERARY:

Wednesday 30 August	Staff and equipment assemble in Barry. Run up and check containers.
Thursday 31 August	All gear ready on wall by 0830. Start loading frames and laboratory items 1600.
Friday 1 September	Site containers. Proof test all lifting equipment. Fit compressors.
Saturday 2 September with	Vessel sails 0930. Proceed to station 2.2 off Clevedon (Fig 1). Vessel fouls screws with anchor wire during anchoring. No work possible.
Sunday 3 September	Further attempts at anchoring but again anchors fouled. No work on deck possible. Starboard bow anchor lost at 1345. No further work possible. Decide to steam to Bridgwater Bay to test piezometer equipment. Start to anchor in Bridgwater Bay 1400. Anchors drag. By 2330 stern anchors twisted.
Monday 4 September	Continue attempts to anchor. Anchors again dragging - no outside work possible.
Tuesday 5 September	0300 start re-anchoring. 0500 anchoring manoevres still not successful. 0730 ship still dragging anchors. Decide to try some work with existing anchor spread. 1000 shear vane apparatus tested from starboard derrick.

	1520 Divers preparing to examine sterngland for wire damage. 1620 Piezometer rig launched o/stern. Brought inboard after 10 minutes due to ship's stern swinging and closing wires against stern. Test of LW prism array on starboard derrick.
Wednesday 6 September	Enter Barry 0630. Divers examine stern gland. Various modifications made to installations on deck. Oxford party depart. IOS staff arrive. Test remote control winch and recalibrate depth sensors. New Master arrives. Professor E Partheniades and Ir W Vlemmix arrive. Anchoring procedure agreed with new Master.
Thursday 7 September	Piezometer rig and platform transferred to forrard hatch. Service overside arrays: Sail 1230 for station 2/2 off Clevedon. Anchor. All array checks completed by 2000.
Friday 8 September	am - check headings on ebb and flood tides and adjust anchors to heading 208°. Ship settling between 205° and 220°T. pm - deploy all O/S gear and run up systems. 1930 - wind increases to W7/8. All gear inboard and secured. 2100 - staff seminar on data processing methods.
Saturday 9 September	am - wind W5/7: visitors arrive 1000: Dr Williams Swansea University. 1100 Visitors plus M R Lees depart for Barry. M R Lees to visit Dentist. pm - wind W6/7 - big swell - no work possible. 1800 sea decreases - boundary layer rig and boundary layer sampler tested. Boundary layer sampler damaged on recovery. 2000-2100 Staff seminary on recording procedure. 2100 - wind W7/8.
Sunday 10 September	am Wind W6/7 still no work possible. pm Sea moderated: 1500 port quarter array deployed. Profiling systems run up. 1940 M R Lees returns on board. 2000 wind increasing 6/7: all gear inboard.
Monday 11 September	am Wind W8/9 no work possible. Adjust anchors to maintain heading. Use Bowthruster to maintain position and heading. pm Wind 8/9. No work possible. Forecast bad.
Tuesday 12 September	am: weather much improved: 0700 all systems in water and running. Start experiment.

12 September continued	0755: staff continue on sea watches.
Wednesday 13 September	am: weather good - local squally showers. 0540 M R Lees lost overboard. Work terminated for search. 1054: search halted. pm: heave anchors. Return Barry roads. Berth Barry 0100.
Thursday 14 September	am Clew up all IOS equipment. pm IOS party departs 1600.
Friday 15 September	am Oxford party arrive pm Remainder IOS party depart 1500.
Saturday 16 September	am Vessel departs Barry 0915. Proceed to Bridgwater Bay. pm 1500 start anchoring. 1650 Anchoring completed smoothly without incident.
Sunday 17 September	am Piezometer rig O/S 0945. Experiment starts 1100. pm Experiment continues smoothly.
Monday 18 September	am Experiment continues pm 1515 Lift piezometer rig: check for status of equipment and cable damage. 1530 Reposition ship on anchors to find another gas pocket. 1610 Rig replace onto sea bed. Restart experiment.
Tuesday 19 September	am Core samples to compare with piezometer data. pm Raise rig at 1530 1630 Proceed Barry roads 2000 Berth Barry Oxford party depart IOS party arrives on board. 2200 Depart Barry for station 2.2 off Clevedon
Wednesday 20 September	am Lay 4 anchor pattern. Set up lab. systems. Recalibrate depth sensors. 0950 Body sighted in water passing with flood tide 300' to starboard. Mate and Dr Salkield proceed in ship's rescue inflatable to investigate. Body identified as probably M R Lees. Brought back to ship. Scientists stood down. RVS informed. pm 1240 Barry Lifeboat arrives to remove body. 1307 Lifeboat departs 1430 Scientific party decide to continue with reduced programme.

Thursday 21 September	am Continue setting up for experiment. 1015 Report HRS wave recorder buoy off station by 2 miles. Advised by HRS that unconventional mooring in use. pm Start equipment run up. 1500 Start vertical profiles 1650 Sampling from high concentration suspensions. Experiment 1 data processing completed. 1700 Boundary layer sampler fouls ship below water line - damage to A frame and rig. Both refurbished.
Friday 22 September	am All system checks completed. pm 1400 Start experiment 2A 1930 End experiment 2A.
Saturday	am 0000 GMT. Start experiment 2B. pm 1820 Braystoke flowmeter interface fails. End of whole depth experiment. Boundary layer experiment continues.
Sunday 24 September	am Vertical profiles continue for high concentration suspensions. Boundary layer experiment continues. pm 1830 End of experiments 1900 All equipment on board 2045 Break out anchors 2345 Berth Barry
Monday 25 September	Clear ship and offload containers. All staff return to Barry.

OBJECTIVES:

To observe the velocity and concentration field at a station for periods of up to 24 hours.
Measurements of pore pressure in gassy sea beds.

PROCEDURES AND METHODS:

Velocity and concentration at fixed heights were measured using 3 arrays. 1. A boundary layer array of EM flowmeters at 5 heights logarithmically spaced over the bottom 3 metres of of flow. This rig also had turbidity sensors and pressure sensors.

2. An "intertidal" array, deployed at fixed depth below the ship measured velocity and concentration at 3 levels in the top 10 metres of the flow.

3. A "low water prism" array, deployed on a ballasted wire, measured velocity at 5 fixed heights and concentration at 3 fixed heights up to 10 m above the bed.

The whole concentration field was observed by continuous vertical turbidity profiles taken in blocks of 3 at 15 minute intervals.

Data from the boundary layer rig was collected continuously and digitized on line.

Data from the other arrays was logged continuously for 5 minutes at 15 minute intervals. During each 5 minute data block 3 vertical turbidity profiles, five 1 minute mean velocities and the concentration temperature and salinity were recorded. Samples of the suspended solids in the bottom 3 metres were taken using a rig designed and built by Swansea University. An illustration showing the data from one such data block is shown in Fig 2. The general arragnement of the experiment is shown in Fig 3.

EQUIPMENT PERFORMANCE: Most items functioned well under adverse conditions. The Braystoke interface proved troublesome and is likely to need replacement with an alternative system. Further developments of sampling are required.

Prepared by: W R PARKER

Approved by: K R DYER

Date: 22 September 1980

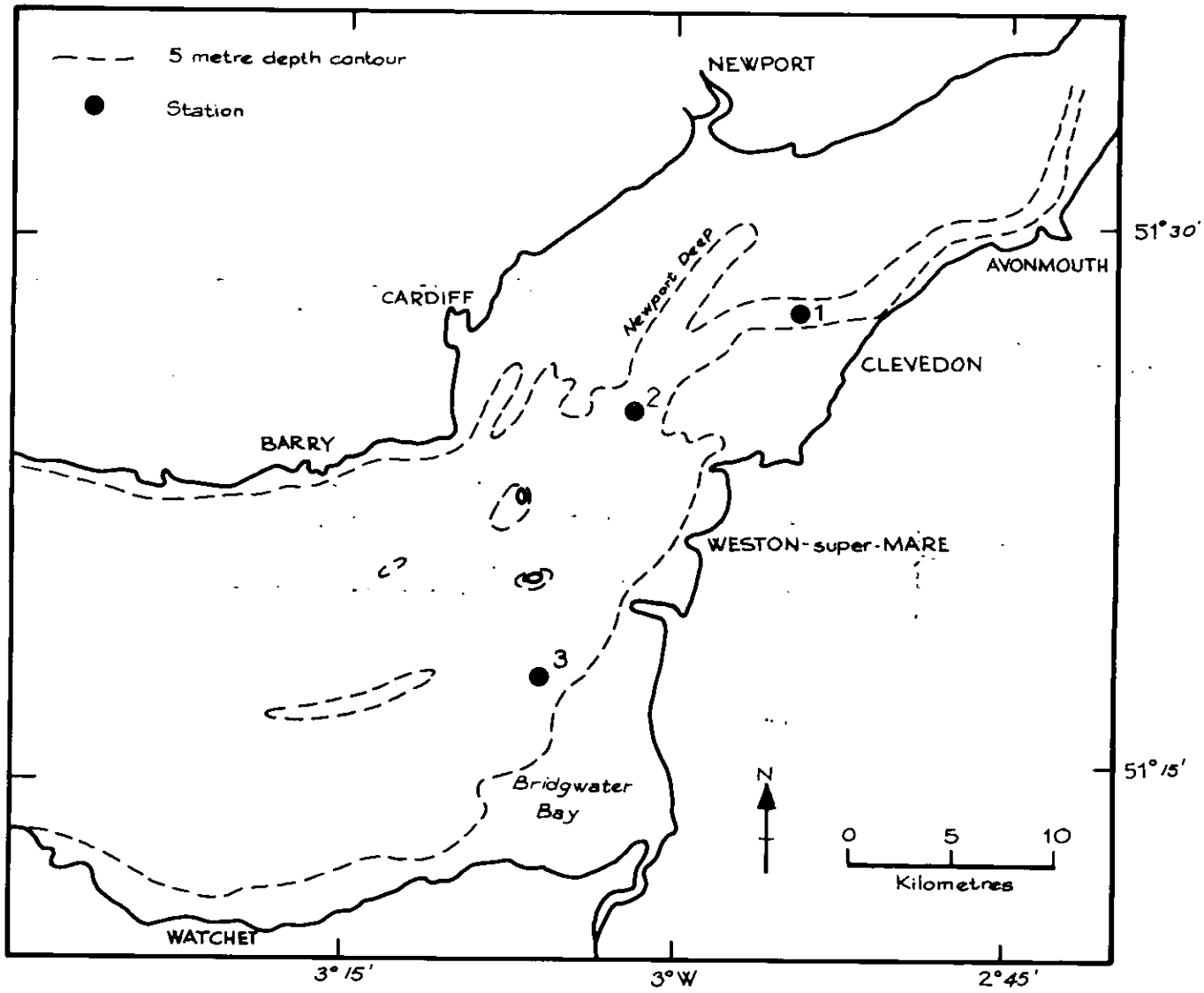
5 metre depth contour
Station
NEWPORT
CARDIFF
Newport Deep
AVONMOUTH
CLEVEDON
BARRY
WESTON-super-MARE
Bridgwater Bay
WATCHET
1
2
3
N
0
5
10
Kilometres
51°30'
51°15'
3°15'
3°W
2°45'

Figure 1.

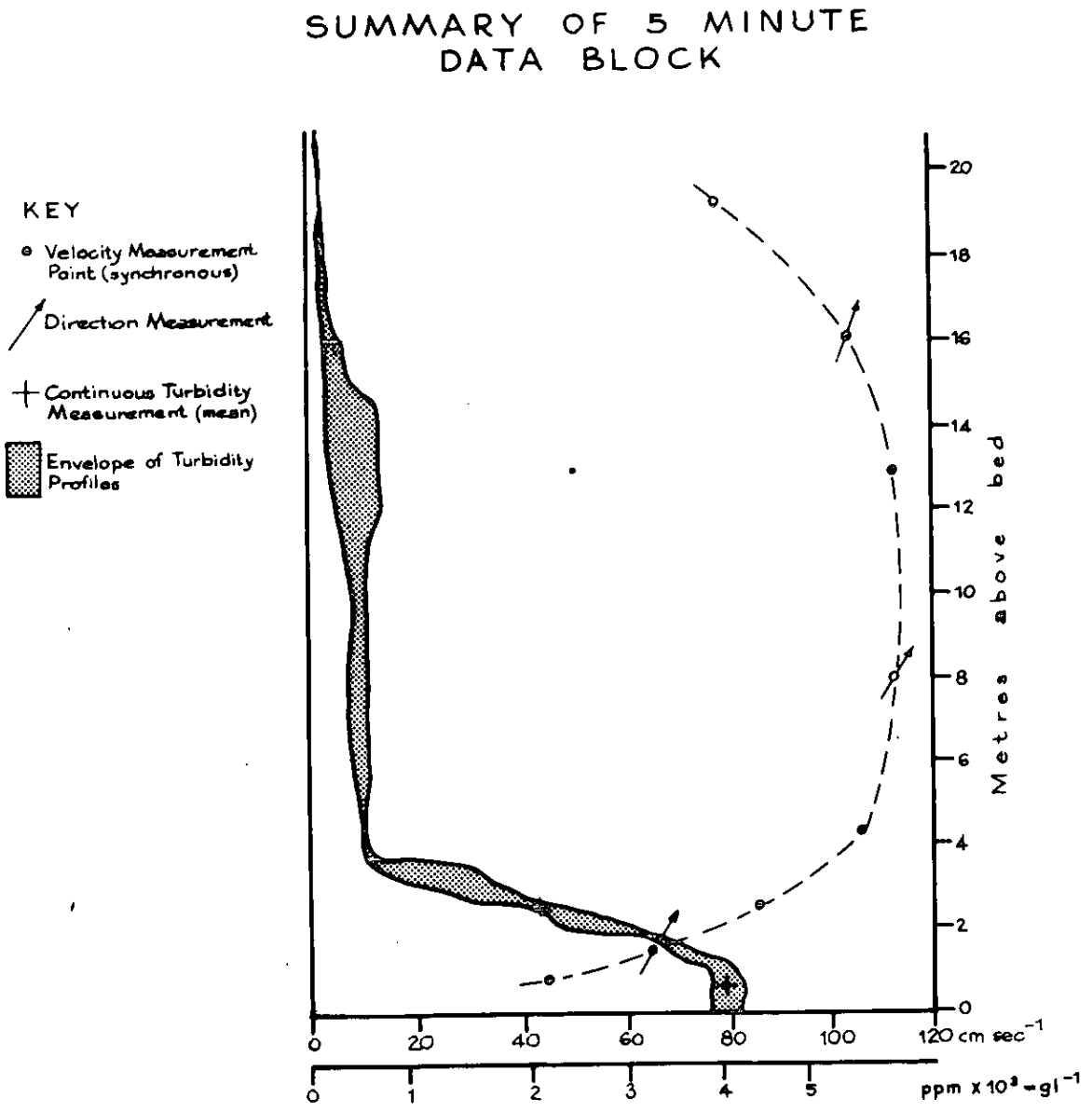

Figure 2. Diagrammatic summary of data from one 5-minute data sample. Velocities as the mean over 5 minutes. Continuous turbidity measurement is the mean over 5 minutes at a fixed height.

GENERAL ARRANGEMENT OF TRANSDUCERS

Figure 3.