I.O.S.

CRUISES UNDERTAKEN BY THE INSTITUTE OF OCEANOGRAPHIC SCIENCES TAUNTON 1982

CRUISE REPORT NO. 150

1983

NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF OCEANOGRAPHIC SCIENCES

INSTITUTE OF OCEANOGRAPHIC SCIENCES

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INSTITUTE OF OCEANOGRAPHIC SCIENCES

TAUNTON

Cruises undertaken by

the Institute of Oceanographic Sciences

Taunton

1982

I.O.S. Cruise Report No. 150

1983

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Natural Environment Research Council

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

PROVISIONAL CRUISE REPORT

VESSEL: M.T. SEPIA

LOCATION: EDDYSTONE WAVERIDER SITES

PERIOD: 19th and 20th January 1982

PERSONNEL:

J D Humphery	HSO	Senior Scientist
A J Marks	SSO	
E J Moore	PTO3	
B M Norman	ASO	

OBJECTIVES: To recover Wavecrest No.104 from the Eddystone station. To deploy Wavecrest No.110 on same mooring. To check Waverider 67201 on station at the Eddystone Rocks. To locate Waverider 6851 at the Eddystone Deepwater station, if possible. To deploy Waverider 67041 at the Eddystone Deepwater station.

PROCEDURE AND METHODS: Rendezvous with Sepia at the Barbican fish quay at 10.30. Loaded Wavecrest buoy No.110 and mooring components.

19.1.82 Departed for Eddystone Rocks. Arrived alongside Wavecrest buoy No.104 at approx. 11.55. Buoy appeared in good condition, no visible fault.

Lifted Wavecrest from water using A-frame, and tied large surface marker buoy onto rubber cord, (in case it was necessary to let the mooring go). Removed Wavecrest 104 and its stabilizing chain from the rubbercord, and removed aerial from the buoy. Fitted aerial to Wavecrest 110 (no spare Wavecrest aerial was available), and connected the new buoy and its stabilizing chain to the rubbercord. Removed the surface marker buoy from the rubbercord, lowered the buoy into the water from the A-frame, and released the mooring. (Sepia had been maintained in position by skilful use of the engines and steering.) Noted Decca positions and time.

Moved alongside Eddystone Waverider 67201. Rubber fender missing, but otherwise the buoy was apparently in good order. Checked Decca positions.

Steamed for the Eddystone Deepwater station. Used the Decca to pin-point the position, and looked for the buoy and listened for it on a hand-held direction finder. Nothing seen or heard. Steamed east and west, (ie the directions in which a trawler is likely to drag the buoy and mooring) of the nominal position for three Decca lanes - nothing seen. Abandoned search.

Trawled for Norway pout on the way home and arrived at the Barbican at approx. 1600.

20.1.82 Met the Sepia at the Barbican at 10.30 again. Loaded

Waverider 67041, its mooring and diving equipment. Steamed for Eddystone Deepwater position.

Arrived on site, prepared buoy and mooring.

Lowered anchor and mooring into the water by hand, and lowered them on the mooring rope to the bottom. Allowed the tide to carry the boat back on the mooring to dig the anchor in, and lowered Waverider into the water from the A frame. Released the mooring; rubbercord pulled buoy back strongly in the water. Noted depth, time and Decca positions.

Trawled for small squid on way back home, and arrived at Barbican fish quay approx 1600.

WEATHER: Fresh breezes on the night of 18th/19th had brought up a 2 m swell which persisted during the cruise period on the 19th, despite the fact that the wind dropped to force 3-4 during the day. The swell dropped to approx 1 m during the night of 19th/20th, but picked up to approx 2.5 m maximum during the following day under the influence of the fresh southerly breeze, force 5.

EQUIPMENT PERFORMANCE: Wavecrest 104 had never produced sensible records since it was deployed on 4.11.81. Furthermore the transmitter (which had always been weak) had stopped working sometime over the Christmas period. Wavecrest 110 had been borrowed from NBA (Controls) Ltd who had prepared the buoy prior to calibration at NMI Hythe. Its transmitter output was checked with an absorption wavemeter prior to deployment. Waverider 67041 and its mooring were prepared in the IOS(T) laboratory prior to deployment. Checks on the transmissions from all three buoys were made at HMS Cambridge (the receiving station) on 21.1.82; satisfactory signals were received.

The new Wavecrest worked on 27.040 MHz; this ensured that its transmissions were 5 kHz removed from the nearest (illegal) CB Channel. This is the same frequency displacement as the Eddystone Waverider from CB emissions, and thus the two buoys should suffer a similar amount of interference.

All equipment used on board Sepia worked perfectly; the crew were very helpful and obviously skilled in their work.

Weather conditions did not allow any diving to be carried out.

ITINERARY:

18.1.82	Loaded van, drove to Plymouth.	
19.1.82	1030	Rendezvous with Sepia at the Barbican.
	1045 approx	Departed for Eddystone.
	1200	Recovered Wavecrest 104.
	1205	Deployed Wavecrest 110.
	1210	Inspected Waverider 67201.
	1300 approx	Unsuccessful search for Waverider 6851.
	1600	Returned to the Barbican.
20.1.82	1030	Rendezvous with Sepia at the Barbican.

	1315	Deployed Deepwater Waverider
	1600	Returned to Barbican
21.1.82	1000	Checked and modified receiving systems at HMS Cambridge. Changed all cassettes and cartridges.
	1245	Arrived IOS(T)

PREPARED BY: J D HUMPHERY

APPROVED BY: AP SALKIELD

DATE: 10-2-82.

INSTRUMENT DETAILS AND POSITIONS:

EDDYSTONE WAVERIDER:

Buoy No:	67201
Calibrated:	14.10.81
Sensitivity:	1.852 Hz m^{-1}
Position:	50°10'34"N
	04°15'42"W
Decca positions:	Chain 1B/MP (SW British)
	Red A 11.70
	Green C 46.25
Date laid:	4.11.81
Time laid:	11.00
Depth:	42.4m mid tide

EDDYSTONE WAVECREST:

Buoy No:	110 (electronics package No.116)
Calibrated:	23.12.81
Sensitivity:	1.827 Hz m^{-1}
Position:	50°10'36" N
	04°15'51" W
Decca positions:	Chain 1B/MP (SW British)
	Red A 11.70
	Green C 46.60
Date laid:	19.1.82
Time:	12.10
Depth:	40.5m mid tide

EDDYSTONE DEEPWATER WAVERIDER:

Buoy No:	67041
Calibrated:	18.8.81
Sensitivity	1.814 Hz m^{-1}
Position:	50°08'02" N
	04°16'40" W
Decca positions:	Chain 1B/MP (SW British)
	Red A 16.0
	Green B 31.85
Date laid:	19.1.82
Time laid:	1315
Depth:	73 m mid tide

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

PROVISIONAL CRUISE REPORT

VESSEL: Swan Dancer

LOCATION: Scilly Isles Waverider site

PERIOD: 23.2.82 - 2.3.82 (unsuccessful trip)
18.3.82 - 20.3.82

PERSONNEL: B M NORMAN ASO Senior Scientist
A J MARKS SSO (1st trip only)
E J MOORE PTO3

OBJECTIVES: To recover Wimpol's Waverider buoy No 67327-7 plus moorings, from Scillies site.

To deploy buoy No 67407-9 on new mooring at same site.

PROCEDURE AND METHODS: Rendezvous with Swan Dancer on Harbour wall at 1700.
Loaded Waverider No 67407-9 and mooring components.
Departed for site 1730.
Arrived at Wimpol buoy approx 1730, buoy appeared to be in good condition.
Sailed to deployment site, approx ½ mile WNW of Wimpol buoy.

The heavy lower part of the mooring was lowered from the 'A' frame in stages, using extra lengths of rope. When the anchor and chain was below the surface, the weight was taken on the main rope mooring. The anchor and chain was lowered to the sea bed and a bight of the mooring rope was made fast to the Swan Dancer. The weight of Swan Dancer was then allowed to pull on the mooring in order to pull the chain straight. When the end of the rope mooring had been secured to the rubber cord, the buoy was manhandled over the side and the bight of rope released, allowing the buoy to float free.

The Wimpol buoy was brought aboard over the transom using the winch through the 'A' frame. When the rubber cord had been brought aboard, the rope part of the mooring was passed around

the winch drum. The rope mooring was hauled aboard, but when the next part of the mooring, which was chain, came to the edge of the transom, the strain proved too great and the rope parted at the point where it is joined to the chain. Subsequently, the anchor and chain was lost.

Arrived back at St Mary's 2212

WEATHER: The high winds and rough seas experienced during the entirity of the first trip made it necessary to return to Taunton having not replaced the buoy.

Arrangements had to be made in order to do the job at very short notice as soon as suitable weather conditions occured.

EQUIPMENT PERFORMANCE: The replacement buoy No 67407-9 is one of the larger 90 cm diameter buoys. The extra weight and size of the buoy presented no real problems provided its handling was carefully thought about before hand, and suitable preparations made.

All equipment used on board Swan Dancer worked perfectly; the crew were very helpful and obviously skilled in their work.

ITINERARY: 23.2.82 - 2.3.82 Unsuccesful trip.

18.3.82	0945	Received message from skipper of Swan Dancer stating that conditions were suitable.
	1030	Left IOS(T).
	1515	Arrived Penzance.
	1600	Flew to St Mary's by Helicopter.
	1700	Loaded buoy and mooring on Swan Dancer.
	1730	Sailed for site.
	1930	Put transmitting aerial in new buoy.
	1955	Deployed new buoy.
	2002	Recovered old buoy.
	2011	Removed transmitting aerial from old buoy.
	2025	Lost anchor and chain whilst hauling.

ITINERARY: (Contd)

18.3.82	2030	Sailed for St Mary's.
	1012	Arrived at St Mary's Quay.
19.3.82		Loaded container with Wimpol Waverider, mooring and equipment ready for loading aboard ferry.
20.3.82	1030	Boarded ferry.
	1050	Sailed for Penzance.
	1300	Arrived Penzance.
	1430	Depart Penzance.
	1800	Arrive Taunton.

PREPARED BY: B M NORMAN

APPROVED BY: A P SALKIELD

DATE: 21'3'82

ABRIDGED DETAILS

Wimpol Waverider buoy

Buoy No	67327-7
Frequency	29.725 MHz
Battery Voltages	17.2 + 17.2 Volts 25.3.82
Position	Red 13.73 Purple 67.93
Depth	100 metres MWD
Deployed	13.10.81
Calibrated	23.7.81
Sensitivity	1.8701 Hz m^{-1}

Waverider Buoy (replacement)

Buoy No	67047-9
Frequency	29.725 MHz
Battery Voltages	19.8 + 20.0 Volts 10.2.82
Position	Red 13.6 Purple 68.3
Depth	100 metres MWD
Deployed	18.3.82
Calibrated	20.11.80
Sensitivity	1.882 Hz m^{-1}

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PROVISIONAL CRUISE REPORT

VESSEL: RV Squilla

LOCATION: Eddystone Rocks, Plymouth

PERIOD: 20-22 April 1982

PERSONNEL:
A J Marks SSO
E J Moore PTO3
B M Norman ASO (Senior Scientist)
L Whitlock ASO

OBJECTIVES:
To recover Eddystone Waverider plus sub-surface float.
To recover Eddystone Wavecrest plus sub-surface float.
To locate and recover sub-surface float that was used on a previous Eddystone deployment.

PROCEDURE AND METHODS:

20.4.82 Launched inflatable at Plymouth Sailing Club slipway. Rendezvous with Squilla at 1540 at Sutton Marina. Loaded diving equipment, etc aboard Squilla.

21.4.82 Rendezvous with Squilla at 0830. Sailed for Eddystone at 0900.

Arrived at Eddystone at 1015. Both buoys were easily sighted from a distance of approx ½ mile. The inflatable, which had been carried on the stern deck, was launched over the stern. Loading of the inflatable was carried out over the gun-whale.

The Waverider buoy was tackled first as records showed that its sub-surface float would probably be the deeper of the two. By doing the deepest dive first maximum use can be made of the available dive time.

The visual inspection showed the buoy to be in good condition although its rubber fender was missing.

BMN and AJM dived with LW as standby. Squilla lay off a little way. The rubber fender was found directly below the buoy, caught on the top termination of the rubber cord. The crab pot marker was also tangled up around this part of the mooring. The tide was still running at approx ½ knot, making it slightly difficult to get to the sub-surface float, also, the rubber cord was covered in marine growth, making it difficult to grip. The sub-surface float was at 13 metres. BMN used a hacksaw to cut through the riser chain, just below the sub-surface float.

The Waverider and the sub-surface float were left connected while they floated on the surface, to make recovery easier.

The Wavecrest and its sub-surface float, which was at a depth of 9 metres, were dealt with in an identical manner.

When both buoys and the sub-surface floats were on the surface, Squilla moved in to retrieve them. BMN went aboard Squilla while AJM, EJM and LW stayed in the inflatable to manoeuvre the buoys to the Squilla. The Wavecrest was light enough to be lifted aboard by hand. All other buoys were lifted using the winch through a block attached to the side of the 'A' frame.

PROCEDURE AND METHODS: (Contd)

21.4.82 When everyone was back on board, an attempt was made to find the third sub-surface float, which had no surface marker. Squilla carried out an echo sounder grid search using Decca coordinates for approximately one hour but failed to locate it. Abandoned search and sailed for Plymouth at 1300.

On arrival at Plymouth fish quay the skipper of Squilla telephoned MBA and arranged for their lorry to take our equipment back to MBA for storage that night.

22.4.82 am Transferred all equipment from MBA's lorry to IOS lorry. Returned to IOS(T).

EQUIPMENT PERFORMANCE: Wavecrest 110 was deployed on 19.1.82 replacing the faulty Wavecrest 104. On 10.3.82 it was noted that Wavecrest 110 was transmitting a very odd "warbling" tone. Although the Wavecrest receiver was locked on to this signal no data was being recorded.

This situation continued until 31.3.82 when it was noted that no signal whatsoever was being received from the Wavecrest buoy.

On return to IOS(T) the Wavecrest was opened. The buoy contained approx 2-3 pints of sea water. There was no obvious leakage point but there was also no sign of vaseline or silicon grease used on the sealing 'O' ring. Two of the hatch securing screws were notably slacker than the rest.

On the 20 May BMN took Wavecrest 110 to NBA for a closer inspection at the factory. The inner sphere was opened to reveal two of the four ligament wires tangled together. The wires were not as tangled as those on buoy 104 but even so this had obviously caused some problems. It was impossible to tell where the water had entered the buoy as no suitable testing facilities were available.

All equipment used onboard Squilla worked perfectly; the crew were very helpful and obviously skilled in their work.

ITINERARY:

20.4.82 am Loaded vehicle, drove to Plymouth.
1500 Launched inflatable, rendezvous with Squilla.

21.4.82 0830 Rendezvous with Squilla.
0900 Sailed for Eddystone.
1015 Arrived at site.
1030 Dived on 1st Sub surface float.
1043 Dived on 2nd Sub surface float.
1140 Began grid search.
1300 Sailed for Plymouth.
1420 Arrived at Fish quay, unloaded Squilla.

22.4.82 0830 Rendezvous with DHJ, loaded lorry.
1005 Left for IOS(T).
1200 Arrived at IOS(T).
pm Unloaded lorry.

Prepared by: B M NORMAN

Approved by: A P SALKIELD

Date: 4/5/82

INSTRUMENT DETAILS AND POSITIONS

Eddystone Waverider:	Buoy No:	67201
	Calibrated:	14.10.81
	Sensitivity:	1.852 Hz m^{-1}
	Position:	50°10'34"N 04°15'42"W
	Decca position:	Chain 1B/MP (SW British) Red A 11.70 Green C 46.25
	Date laid:	4.11.81
	Time laid:	1100
	Date recovered:	21.4.82
	Time recovered:	1030
	Depth:	42.4 m mid tide.

Eddystone Wavecrest:	Buoy No:	110 (electonics package No 116)
	Calibrated:	23.12.81
	Sensitivity:	1.827 Hz m^{-1}
	Position:	50°10'36"N 04°15'51"W
	Decca position:	Chain 1B/MP (SW British) Red A 11.70 Green C 46.60
	Date laid:	19.1.82
	Time laid	1210
	Date recovered:	21.4.82
	Time recovered:	1043
	Depth:	40.5 m mid tide.

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PROVISIONAL CRUISE REPORT

VESSEL: RV Wessex Explorer

CRUISE LOCATION: Start Bay

CRUISE PERIOD: 25 and 26 April 1982

PERSONNEL:
D N Langhorne
P M Hooper
E J Moore

OBJECTIVE:

A) To carry out a detailed bathymetric survey of part of the sandwave field on the eastern flank of the Skerries Bank. This area was last surveyed in detail in 1977 and it is intended to compare the two surveys in order to study the long period changes in sandwave morphology (see attached diagram).

B) To carry out survey lines along the track of the SAR 580 float during the studies conducted in July 1982.

PROCEDURE AND METHODS:

A) Trisponder remote stations were set up at Start Point and at Strete (the same positions as used on the previous survey). The master aerial was mounted on board close to the echo sounder transducer (<0.5 m). Trisponder ranges were to be recorded by printer at 10 sec intervals and on magnetic tape at 1 sec intervals. Trisponder ranges were also used for the ship's track plotter. Survey tracks were spaced at approximately 12 m intervals.

B) Depth was measured using both a Raytheon (200 KHz) and Atlas (30 + 200 KHz) echo sounders. Transducers were pole mounted on the port side at 1 m depth beneath the surface.

C) Sidescan sonar data was obtained using EG + G equipment with a towed transducer and 100 m range scales.

EQUIPMENT PERFORMANCE:

A) Trisponder - good.
On several occasions the track plotter lost lock. This tended to occur in particular locations. The Trisponder printer proved to be unreliable (printing errors in both fix number and time) and its use was discontinued after the first few hours.

Preliminary inspection of the magnetic tape shows that there is some corruption.

B) Raytheon echo sounder - good.

C) Atlas echo sounder - good.

D) Sidescan sonar - good.

SHIP PERFORMANCE: The Wessex Explorer is a well equipped and efficient survey vessel providing adequate lab and deck space for this type of work. Unfortunately, because it is necessary to pole mount the echo sounder transducer, it is not possible to survey at speeds greater than 6 knots. At lower speeds she tends to roll badly which introduces distortions to the echo sounder records.

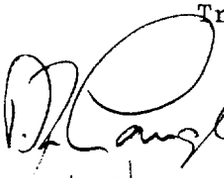
RESULTS: Good. Approximately 40 echo sounding traverses were obtained which gave the necessary high density cover of the area. On both survey days sea conditions were good with light NE winds which decreased during the afternoons and evenings.

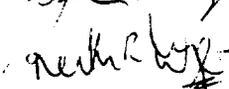
ITINERARY:

24.4.82. 0900. Travelled to Start Bay and set up Trisponder remotes. PM Wessex Explorer arrived at Dartmouth and berthed at Kingswear Marina. Set up and tested equipment on board.

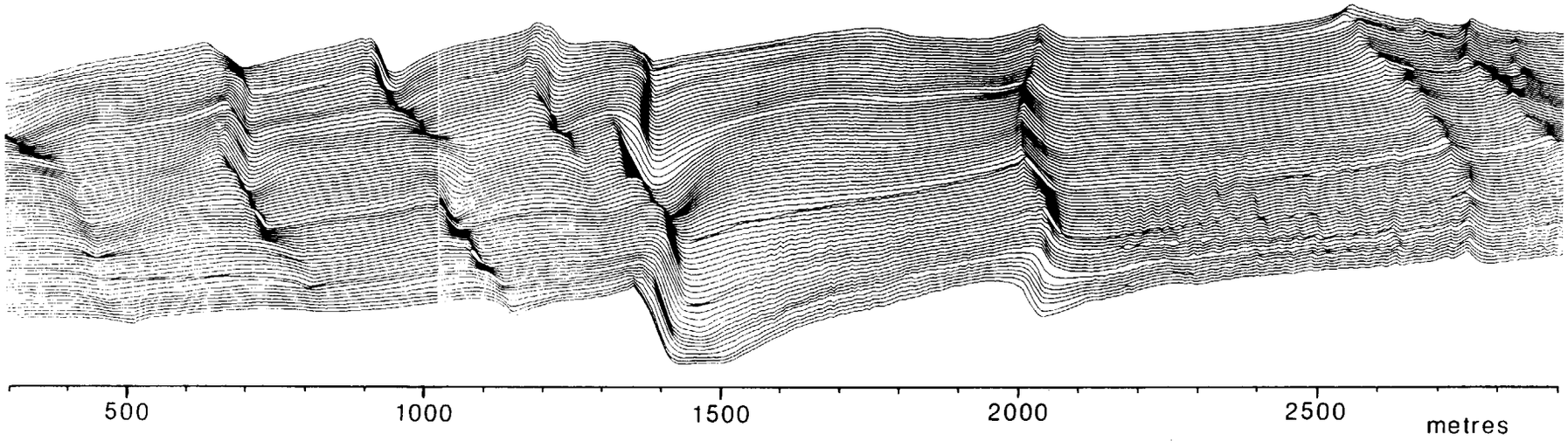
25.4.82. 0840. Sailed for survey area.
1940. Completed surveying. Returned to Dartmouth.

26.4.82. 0850. Sailed for survey area.
1531. Completed main survey. Carried out survey lines for SAR 580 project.
1610. Abandoned survey due to repeated failure of track plotter. Returned to Dartmouth. Stripped down and removed equipment from the ship. Recovered Trisponder remote stations and returned to Taunton.

PREPARED BY:  (D N LANGHORNE)

APPROVED BY:  (K R DYER)

DATE: 29.4.82.



SANDWAVES IN START BAY, DEVON. JULY 1977

Natural Environment Research Council

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PROVISIONAL CRUISE REPORT

VESSEL: MT Swan Dancer

LOCATION: Waverider site west of Scilly Isles

PERIOD: 29 June-3 July 1982

PERSONNEL: B M Norman ASO Senior Scientist
E J Moore PTO III

OBJECTIVES: To move existing Waverider installation to new site, so as not to leave it in the middle of a shipping lane when the new shipping separation zone scheme is introduced on 1 July 1982.

PROCEDURE AND METHODS: The existing Waverider is larger than previous buoys and has a considerably longer battery life. It has only been on station for three months. For these two reasons it was decided to use the same buoy and mooring on the new site. However, another buoy and complete mooring was prepared and taken out on the vessel in case any part of the existing installation was found to be damaged or worn.

Rendezvous with Swan Dancer and skipper Dave Thompson on the pier at St Marys. The new buoy was energised on the pier but the aerial was not fitted. The buoy and new mooring was loaded aboard Swan Dancer. Sailed for Waverider site 0900.

Sighted the buoy, 67407-9, at approximately 1100. The buoy was 0.2 of a lane west of its original position according to Swan Dancer Decca Navigator. Skipper Thompson explained that this amount of difference was common between night and day time fixes. The buoy was originally deployed at night.

The buoy appeared to be in good condition. It was brought to the stern of the boat using a boat hook. A rope was passed from the winch through a block at the top of the 'A' frame and attached to one of the buoy's handles. The boat was put astern to gain slack on the mooring, the buoy was then lifted into the stern of the boat. The rope was then transferred to the top of the rubber cord, so that there was no strain directly on the buoy. At this stage the aerial was removed. The rubber cord was brought aboard while Swan Dancer went astern to give slack. As soon as the mooring rope was reached it was made fast on one of the stern posts. Enough slack was gained to enable a bight of rope to be passed right over the top of the 'A' frame, via a roller, and onto the winch drum. The mooring rope was then taken off the stern post so that the strain was taken directly on the winch drum. The mooring was raised until the bottom of the mooring rope was visible. The tail of rope with the two 11" trawl floats was twisted around the main mooring rope very tightly, it was impossible to untangle this. The bottom of the mooring rope was clean and showed no sign of wear indicating that the lower trawl floats were still doing their job. The shackle joining the rope to the anchor chain was in good condition. Its wire mousing was still intact, as were all other mousings inspected. The mooring could not be raised any further without putting considerable strain on the rope mooring.

PROCEDURE AND METHODS: (Contd)

With the mooring in this state Swan Dancer sailed to the new site. At the new site the mooring was lowered to the sea bed. Swan Dancer went gently ahead to pull the anchor chain straight. The aerial was replaced after re-seating in silicon grease. The buoy was lifted by the handles and lowered into the water with the buoy deployed, Swan Dancer held station nearby until the tide pulled the mooring rope straight. The buoy appeared to be satisfactorily moored. Swan Dancer then returned to St Marys where the spare buoy was de-energised.

EQUIPMENT PERFORMANCE:

All equipment used worked perfectly. The H_s/N_z meter installed in the computer room at IOS(T) proved very useful for judging when conditions were suitable to work at sea.

ITINERARY:

29.6.82	1100	Departure IOS(T).
	1700	Arrive Penzance.
30.6.82	0930	Departure Penzance.
	1145	Arrive St Marys.
1.7.82	0830	Load Swan Dancer.
	0845	Energise spare buoy.
	0900	Sail for site.
	1105	Arrived at original site.
	1110	Buoy lifted.
	1115	Aerial out.
	1130	Sailed for new site.
	1155	Aerial in.
	1201	Buoy gone.
	1500	Arrived St Marys.
	1510	De-energised spare buoy.
2.7.82	1630	Departure St Marys.
	1900	Arrive Penzance.
3.7.82	0830	Departure Penzance.
	1630	Arrive IOS(T).

PREPARED BY: B M NORMAN

APPROVED BY: A P SALKIELD

DATE: 4/8/82

ABRIDGED DETAILS

Buoy No	67047-9
Frequency	29.725 MHz
Battery Volts	19.80 + 20.00 on 10.2.82
Deployed	18.3.82
Calibrated	20.11.82
Sensitivity	1.882 Hz m^{-1}
Old position	Decca Red 13.60 Purple 68.3 6° 40.0'W 49° 55.0'N
Depth	53 fathoms
New position	Decca Red 13.50 Purple 67.35 6° 36.6'W 49° 55.1'B
Depth	55 fathoms

ie 2.2 nautical miles towards the receiving site.

Natural Environment Research Council

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Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

Vessel	Notre Dame
Owner	D B MacLeod Oiteag No Mara Bruernish Barra Outer Hebrides Scotland Tel: North Bay (08715) 384
Location	All Waverider sites to west of South Uist
Cruise Period	0900 - 1900 11 July 1982
Personnel	J D Humphery HSO E J Moore PTO III B M Norman ASO Senior Scientist
Objectives	To recover Waverider buoys and moorings if possible from the Deepwater, Offshore and Inshore III positions to the west of South Uist. To deploy all but the Inshore buoy on new moorings on the same positions.
Procedure and Methods	Drove to Castlebay Jetty, met the skipper and crew of Notre Dame at approx 0900. The two replacement buoys were energised on the quay side. The smaller equipment was loaded by hand; the jilson was used to load the Waveriders and other heavy gear. Reeled 75 m x 13 mm wire for offshore mooring recovery onto starboard winch-drawn, with 115 kg grapnel shackled to end. Reeled 75 m x 13 mm wire for offshore mooring deployment onto port winch drum, with 1 ton of anchor chain shackled to end on chain strop. Sailed for deepwater site at approx 0945. Arrived at deepwater site at approx 1250; new deepwater mooring had been prepared on the starboard side-deck while steaming to site. Anchor and chain were paid out on the 200 m rope and lowered to the bottom on the winch. Some tension was maintained to pull the chain out straight and then the buoy was lowered over the side by hand. Position, depth and time were noted. Waverider (deployed 1.8.81) appeared in good condition. Lifted buoy onto deck using jilson, recovered rubbercord by hand, and 200 m of rope using winch. Recovered anchor and chain by "stopping off", and using jilson. Arrived at offshore site approx 1415. Lowered replacement offshore buoy, lowered overside by hand, paid out rubbercord and rope. The buoy was not allowed to drift far enough away from the vessel before the sub-surface float was deployed. Consequently the buoy became entangled in the mooring rope. After freeing the sub-surface float it was allowed to drift astern as the riser chain was paid out. The anchor clump had

become stuck in the stern gallows and considerable effort was needed to free it. Lowered anchor clump to bottom on 75 m wire; when weight on bottom, moved clear and cut wire, allowing it to drop free. Noted depth, position and time.

Came along side offshore buoy, which was in good condition (deployed 1.8.81). Recovered buoy on jilson and rubbercord by hand. Marked rope with A4 Polyform buoy, and unshackled rope from rubbercord and allowed it to drop free. Paid out 75 m recovery wire and grapnel, and approx 150 m trawl warp, while steaming round marker. Stopped the ship and hauled on the winch-grapnel, caught riser chain at first attempt - lifted sub-surface float onto deck with jilson. Recovered chain and anchor by stopping off and using jilson. Noted depth, position and time. Steamed for Inshore III position.

Arrived Inshore position 1527, buoy appeared in good condition (deployed 1.8.81). Recovered buoy and rubbercord on deck using jilson and winch. Hooked buoyant chain from the water using the jilson, and recovered the 50 m length by stopping off and using the jilson.

Sailed from Inshore III position 1559. Arrived Castlebay 1825.

Weather

Ideal weather conditions prevailed throughout the time spent at sea. Very slight sea with a low underlying swell.

Equipment Performance

The Waveriders had been prepared and tested prior to leaving IOS (T). They were emission tested with an absorbtion wave-meter. Moorings were made up and flaked out on deck from components brought from IOS(T).

Itinerary

0900 Rendezvous with Notre Dame at Castlebay.

0945 Sailed for Deepwater site.

1250 Arrived Deepwater site - deployed new buoy.

1300 Recovered old Deepwater buoy.

1415 Arrived Offshore site - deployed new buoy.

1435 Recovered old Offshore buoy.

1527 Arrived Inshore site - recovered buoy.

1559 Sailed for Castlebay.

1825 Arrived Castlebay.

Positions

Deepwater Buoy deployed:	11 July 1982
Waverider No:	67749-7
Decca Chain:	8E/MP (Hebridean)
Green:	D 30.10
Purple:	A 73.80
Depth:	48 fathoms
Time:	1255 BST

Offshore buoy deployed:	11 July 1982
Waverider No:	67042
Decca chain:	8E/MP (Hebridean)
Green:	D 32.20
Purple	A 58.90
Depth:	28 fathoms
Time:	1428 BST

Prepared by: B M NORMAN

Approved by: A P SALKIELD

Date: 19-10-82

ABRIDGED DETAILS OF HEBRIDES VISIT, 9 July - 17 July 1982

Waverider deployments:

Deepwater Site:	Buoy No:	67749-7
	Calibrated:	15.4.82
	Sensitivity:	1.87802 Hzm^{-1}
	Position:	
	Decca readings:	Chain 8E/MP (Hebridean)
		Green D 30.10
		Purple A 73.80
	Date:	11.7.82
	Time:	1255 BST
	Depth:	48 fathoms
	Battery volts:	20.5 + 20.5
	Frequency:	29.725 MHz
	Output meter reading:	10
Offshore Site:	Buoy No:	67042
	Calibrated:	22.1.82
	Sensitivity:	1.82956 Hzm^{-1}
	Position:	
	Decca readings:	Chain 8E/MP (Hebridean)
		Green D 32.20
		Purple A 58.90
	Date:	11.7.82
	Time:	1428
	Depth:	28 fathoms
	Battery volts:	21.2 + 21.2
	Frequency:	29.825 MHz
	Output meter reading:	9.4

Waverider recoveries:

Deepwater Site:	Buoy No:	67043
	Deployed:	1.8.81
Offshore Site:	Buoy No:	67214
	Deployed:	1.8.81
Inshore III Site:	Buoy No:	67213
	Deployed:	1.8.81

Receiving Systems:

	Calibrated:	13.7.82
Deepwater System:	Frequency:	29.725 MHz
	Eddystone receiver:	EC964/7C/458 inventory No 1090
	Microdata logger No:	1036
	Recording channel:	6
	Readings prefixed by:	-
	Unlocked display:	-0000
	Sensitivity:	$-64\ Hz^{-1}$
Offshore System:	Frequency:	29.825 MHz
	Eddystone receiver:	EC964/7C/553 inventory No 1106
	Microdata logger No:	1037
	Recording channel:	6
	Readings prefixed by:	-
	Unlocked display:	-0000
	Sensitivity:	$-64\ Hz^{-1}$

Natural Environment Research Council

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

PROVISIONAL CRUISE REPORT

VESSEL: RV Frederick Russell
Cruise No 13/82

CRUISE LOCATION: La Chapelle Bank (SW Approaches) and the Isle of Wight/West Solent

CRUISE PERIOD: 1 - 20 September 1982

PERSONNEL:

A D Heathershaw (Principal Scientist)	1-20 September
J D Humphery	1-20 September
P M Hooper	1-14 September
D J Corns (Mrs)	1-14 September
G P Le Good	14-20 September
P D Thorne	14-20 September
R A Haine	14-20 September
D N Langhorne	14-20 September
A P Salkield	15-19 September
R Powell (RVS)	1-15/19-20 September
P Taylor (RVS)	1-14 September
M Overs (Bristol University)	1-14 September
J Hardisty (Bristol University)	14-20 September
D Hamilton (Bristol University)	17 September
C Hood (MAFF)	15-16 September
Capitaine M de Jaffry (Marine Brest)	3-9 September

OBJECTIVES: La Chapelle Bank 1-14 September 1982

a) To carry our echosounding and sidescan sonar observations to determine the size and extent of sandwaves on La Chapelle Bank (Figure 1).

b) To deploy recording current meter (RCM) and thermister chain (TC) moorings on a line across the shelf break.

c) To deploy Bristol University remote recording shelf sediment monitor (BLIP).

d) To carry out salinity and temperature measurements using CTD, XBT and thermo-salinograph equipment.

e) To obtain sediment samples and carry out underwater photography at selected sites.

West Solent 14-20 September 1982

a) To deploy recording current meter and Bristol University equipment (BLIP) at a location to the S of the Isle of Wight (Figure 2).

b) To carry out boundary layer flow measurements and observations of gravel movement in the West Solent (Figure 2).

The work on La Chapelle Bank and in the West Solent form part of Science vote funded projects S28 and S26 respectively.

PROCEDURE AND METHODS:

La Chapelle Bank

a) A total of 22 Aanderaa RCM4 recording current meters were deployed on 4 moorings (RCM1, RCM2, RCM3, RCM4 - see Figure 1) on a line extending about 25 km across the shelf break and ranging in depth from 160 to 500 m. Details of the moorings and their locations are given in Appendix A.

b) Two Aanderaa 50 m thermistor chain moorings (TC1 and TC2 - see Figure 1) were deployed in 170 m of water on a line approximately 5 km to the west of the current meter moorings.

c) XBT measurements were carried out prior to deployment of current meter and thermistor chain moorings to determine optimum heights for current meters and thermistor chains relative to the thermocline.

d) Echosounding was carried out prior to and following deployment of current meters and thermistor chains to determine the overall depths for moorings, and the general battymetry of the area.

e) Underwater photography was carried out using a UMEL 35 mm stereo camera pair and sediment samples collected using a Shipek grab and occasionally a Day grab.

f) Sidescan sonar observations were accomplished using the IOS Taunton EG & G 272 fish (105 kHz) with an RVS 259 winch. No cable depressor was used.

g) Sea surface temperature and salinity measurements were made, using a Plessy thermo-salinograph, on transects running across the shelf edge.

h) Trials of an Oceano transponding release were carried out close to the position of RCM3.

i) Position fixing was carried out with Decca main chain (SW British 1B1MP) and Magnavox 1107 satellite navigation.

j) Bristol University remote recording sediment monitor (BLIP) was deployed for trials close to RCM3 in 167 m of water.

West Solent

a) Three Aanderaa RCM4 recording current meters were deployed in about 30 m of water at a location about 7 km S of the Needles, Isle of Wight (Figure 2). Near bed current measurements were required as design data for IOS remote recording equipment.

b) Boundary layer flow measurements and observations of gravel movement were carried out in the West Solent (Figure 2) using two rigs alternately on ebb or flood stages of the tide. A small rig carried 4 Ott propeller current meters at heights of 10, 22, 46 and 100 cm above the seabed and an RT Labs. SIT underwater camera. The other larger rig carried 6 Ott current meters at heights of 15, 25, 40, 65, 100 and 180 cm above the seabed, 2 electromagnetic flowmeters mounted so as to record 3 components of the turbulent flow (u, v, w) at a height of 32.5 cm above the bed and 2 hydrophones for measuring acoustic noise generated by gravel movement on the seabed (self generated noise - SGN). The RT Labs SIT camera was also used on this rig.

c) Trials were carried out in the West Solent on MAFF sector scanning sonar mounted over the ship's side.

EQUIPMENT PERFORMANCE:

a) With the exception of the spooler release on current meter mooring RCM1 and a thermistor chain termination on mooring TC1 all current meter and thermistor chain mooring equipment operated satisfactorily. The failure of the spooler on RCM1 led to the loss of the mooring with 5 current meters. The thermistor chain on TC1 was lost as the result of a termination failure (the sub-surface buoy was, however, recovered.

b) Echosounding (PES) equipment operated satisfactorily although it was necessary to operate the MUFAX recorder at a higher than usual gain setting. Additionally, accurate depth information on the slope in the vicinity of canyons or other irregular topography was not possible due to the broad beam (20°) and side lobe effects on the 10 kHz PES. Attempts to detect internal waves with a Raytheon 200 kHz echosounder were not successful.

c) Sediment sampling equipment was in general satisfactory although, despite repeated attempts, no samples could be obtained with the Day grab. The reasons for this failure were not clear. The majority of samples were recovered using a Shipek grab.

d) Attempts to use a Columbus weight as a depressor for the EG & G sidescan sonar were unsuccessful. No attempt was made to use the EG & G depressor as this may have resulted in damage to the cable. Instead, the sonar fish was streamed on about 600 m of cable to put it within about 50 m of the bed. Some good records were obtained. However, due to height changes on the fish, consistently good high resolution coverage was not possible.

e) A fault on the CTD ESP unit meant that no CTD data could be collected during this cruise. The was despite repeated attempts to correct the fault prior to sailing and during the cruise.

f) Bristol University equipment (BLIP) was successfully deployed close to the position of mooring RCM1. However, repeated attempts to recover the instrument were not successful even though the acoustic release had been successfully fired. The tilt warning on the acoustic release indicated that BLIP was lying at an angle to the bed suggesting that its buoyancy was flooded.

g) Trials with the Oceano transponding acoustic release were successful.

h) The UMEL stereo camera system performance was disappointing. Good stereo pairs could not be obtained due to loss of synchroneity between cameras and between the cameras and the flash unit. Additionally there were problems with the cameras firing prematurely in mid-water.

i) With the exception of the electromagnetic flowmeters (which were subsequently replaced with a spare system) all boundary layer flow measuring equipment operated satisfactorily. Underwater TV worked well although the pan and tilt unit failed due to flooding. Tests with the self-generated noise (SGN) equipment were very successful and will provide a valuable insight into sediment transport processes. Both rigs were operated successfully, the large rig from the stern and the small rig over the side. However,

the sediment trap on the small rig did not recover fully representative gravel samples.

j) Tests on the MAFF sector scanning sonar were of limited success as measurements could only be made in the flat bed gravel area. Planned tests on gravel bedforms were curtailed as a result of damage to the sonar from one of the boundary layer rigs.

k) Position fixing in the La Chapelle Bank area was by Decca Main chain and satellite navigation. However, failure of the ship's EM log meant that frequent manual updates on the ship's speed were required for good DR. This was not always practicable. With the exception of some 'dawn effect' periods, Decca main chain SW British 1B/MP was successfully monitored. Attempts to use the French chain (8B/MP) and Loran C were not successful. For the work in the W Solent Decca trisponder equipment was successfully used as on previous cruises.

SHIP PERFORMANCE:

The ship provided good accommodation and laboratory facilities. No problems were experienced with handling equipment on deck.

Winch overheating and loss of hydraulic fluid occurred when attempts were made to grapple for the lost current meter mooring on RCM1. About 1100 m of wire and a Giffard grapnel were subsequently lost when the wire became snagged on an obstruction on the seabed.

Despite repairs to the ship's EM log prior to sailing, this unit subsequently failed at sea. EM log data were thus not available for up-dating DR positions from the satellite navigation system.

Similarly to last year, boundary layer flow measuring and TV equipment was operated successfully over the side and from the stern, with the ship riding to a single bow anchor. The bow thruster was used to settle the ship in position at the turn of the tide.

During the first leg of the cruise a French observer was successfully embarked by Helicopter. Apart from the loss of 1 scientist's berth, this operation did not present any major difficulties.

RESULTS:

La Chapelle Bank

Despite the lack of CTD data and the loss of one current meter mooring and one thermistor chain mooring, this cruise has provided a large amount of reliable near-bed, mid-depth and near-surface current meter data. Together with the data from the remaining thermistor chain and the temperature and conductivity sensors on various current meters, this should enable some preliminary assessment to be made of the rates of sediment movement in the La Chapelle Bank area. It should also be possible to examine the role of any coupling between internal waves and sandwaves. In adddition good velocity profile data, over almost the total depth, were obtained at RCM3 (Figure 1 and Appendix A).

Sediment samples (a total of 33) obtained in the study area, indicated a high proportion of comminuted shell and other biogenic material. Some of these samples will be large enough to enable settling column analyses and threshold studies to be carried out.

Sidescan and echosounding data will enable the orientation, height and asymmetry of sandwaves to be determined which should lead to an improved understanding of local sediment circulation at the shelf break.

All these data will provide valuable background information for later deployments of remote recording shelf sediment monitors.

West Solent

Current measurements from an area to the S of the Isle of Wight will provide useful estimates of likely gravel movements under tidal currents alone. At a later stage it is hoped to deploy remote recording equipment at the same location to determine the effects of waves and current. The present current meter data will assist with the design of this equipment.

Within the West Solent a large amount of good boundary layer flow and sediment transport data were obtained. Good records were obtained from the SGN probes, the electromagnetic flowmeters and the underwater television system. This information should enable detailed studies to be made of coarse sediment movement in a turbulent tidal boundary layer.

ITINERARY:

1.9.82 IOS and Bristol University personnel joined ship in Barry. Loaded scientific equipment.

2.9.82 RVS personnel joined ship.
0900 Sailed Barry for La Chapelle Bank.

3.9.82 1030 Embarked French observer by helicopter approximately 180 km due W of Brest.
1400 Arrived La Chapelle Bank. Commenced echosounding and XBT measurements.
2215 Carried out tests on acoustic releases.
2250 Continued echosounding overnight.

4.9.82 1035 Deployed RCM1
1332 Deployed RCM2
1537 Deployed Selco buoy at RCM3 position.
1840 Deployed RCM3
1905 Continued echosounding overnight.

5.9.82 0826 Deployed Selco buoy at RCM4 position.
1009 Deployed RCM4
1316 Deployed TC2
1431 Deployed TC1
1953 Deployed BLIP close to RCM3 position.
Hove to overnight to ride out gale.

6.9.82 0845 Returned to La Chapelle Bank.
1325 Attempted to recover BLIP.
1925 Abandoned attempts to recover BLIP.
2000 Continued echosounding overnight.

7.9.82 0910 Started sediment sampling and underwater photography.
1900 Continued echosounding overnight.

8.9.82 0800 Stopped echosounding and continued sediment sampling.
0945 Recovered TC1 subsurface buoy adrift. Resumed sediment sampling.
1613 Continued underwater photography.
1940 Continued echosounding and started sidescan sonar observations overnight.

9.9.82 0800 Stopped echosounding and sidescan sonar survey and proceeded to Brest.
1800 Arrived Brest. Disembarked French observer.

10.9.82 1800 Sailed Brest for La Chapelle Bank.

11.9.82 0600 On station RCM1 for recovery.
0650 Fired release but mooring did not surface. Switched off pinger and decided to leave for later recovery.
0980 Recovered RCM2
1050 Recovered RCM3
1243 Recovered RCM4
1300 Recovered Selco buoy on RCM4 position.
1408 Recovered TC2 and returned to RCM1 position.
1645 Dragged for RCM1. Snagged mooring and obstruction on bottom.
2020 Abandoned further attempts to recover RCM1 after losing Giffard grapnel and 1100 m of main warp. Resumed echosounding overnight.

12.9.82 1049 Deployed RVS test rig with Oceano release close to RCM3 position and commenced tests.
1451 Recovered test rig.
1511 Recovered Selco buoy on RCM3 position.
1624 Continued sediment sampling and underwater photography.
2035 Completed sediment sampling and departed study area for Plymouth.

13.9.82 1700 Arrived Plymouth.

14.9.82 Unloaded scientific equipment and exchanged scientific personnel. Loaded boundary layer equipment.
1800 Sailed Plymouth for Isle of Wight.

15.9.82 0858 Laid current meter mooring S of Isle of Wight.
1050 Anchored Yarmouth Roads - fog bound.
~1300 Embarked IOS and MAFF personnel, MAFF personnel for day only for tests on sector scanning sonar. Set up Decca trisponder units.

1927 Moored ship and anchored in flat bed gravel area.
2120 Completed tests on boundary layer rigs and equipment but abandoned overnight working due to instrument problems.

16.9.82 ~1000 MAFF personnel rejoined ship for day only.
1113 Commenced boundary layer flow measurements and gravel movement studies. Continued tests on sector scanning sonar. Carried out boundary layer/gravel observations overnight.

17.9.92 Continued boundary layer/gravel studies and tests on sonar.
1100 Bristol University personnel joined ship for day only.

18.9.82 Continued boundary layer/gravel measurements.

19.9.82 1245 Stopped all measurements and recovered Decca trisponder units.
1325 Weighed anchor and sailed for current meter mooring position S of Isle of Wight.
1745 Recovered RCM1 S of Isle of Wight.

20.9.82 0800 Arrived Plymouth. Unloaded scientific equipment.
~1200 IOS, RVS and Bristol University personnel left ship.

PREPARED BY: (A D HEATHERSHAW)

APPROVED BY: (K R DYER)

DATE: 10 Nov 1982

APPENDIX A: Details of current meter and thermistor chain moorings.

La Chapelle Bank

	Decca		Lat/Long	
RCM1	G0.97	D46.42	47° 35.05'N	7° 16.46'W
RCM2	F23.40	D46.77	47° 38.33'N	7° 14.84'W
RCM3	F22.50	D46.80	47° 40.56'N	7° 13.21'W
RCM4	F20.03	D47.35	47° 45.51'N	7° 10.75'W
TC1	F21.74	E30.50	47° 38.66'N	7° 18.93'W
TC2	F20.43	E30.70	47° 41.60'N	7° 17.12'W

Isle of Wight

RCM1	I7.00	G76.05	50° 36.15'N	1° 35.25'W

APPENDIX A

Details of heights of current meters and thermistor chains and deployment periods.

La Chapelle Bank

Current Meter/ Thermistor Chain	Station	Depth (m)	Height (m)	Start+	Finish+	Sensors
4374	RCM1	500	450	2350/3.9.82	L	C/T
4775			252	"	L	C/T
5319			10	"	L	T
6276			5	"	L	T
4780			2	"	L	C/T
5916	RCM2	160	122	1220/4.9.82	2005/12.9.82	C/T/P
5910			102	"	"	C/T/P
5911			10	2350/3.9.82	2100/12.9.82	C/T
5908			5	1220/4.9.82	2140/12.9.82	C/T
4777			2	"	2030/12.9.82	C/T
5909	RCM3	167	121	1440/4.9.82	1910/12.9.82	C/T/P
3924			111	"	1830/12.9.82	C/T/P
5317			75	"	1830/12.9.82	C/T
4779			30	"	1805/12.9.82	C/T
5227			10	"	2100/12.9.82	C/T
4373			5	"	1916/12.9.82	C/T
3308			2	"	1830/12.9.82	T
5915	RCM4	167	120	2005/4.9.82	1945/12.9.82	C/T/P
5917			115	"	1915/12.9.82	C/T/P
3257			10	"	1945/12.9.82	C/T
4817			5	"	1830/12.9.82	C/T
3311			2	"	2030/12.9.82	C/T
919/701	TC1	170	80/130		L	T x 11
777/602	TC2	170	90/140		1915/12.9.82	T x 11

APPENDIX A

Isle of Wight

Current Meter	Station	Depth (m)	Height (m)	Start+	Finish+	Sensors
5908	RCM1	30	10	2016/14.9.82	1912/19.9.82	C/T/P
5909			5	2016/14.9.82	1921/19.9.82	C/T/P
5910			2	2036/14.9.82	1921/19.9.82	C/T/P

Notes: + Times of first and last records to nearest minute. These times give approximate record lengths only.

Recording interval was 5 minutes in all cases.

C/T/P denotes conductivity, temperature and pressure sensors respectively.

L denotes instruments that were lost.

FIGURE CAPTIONS

Fig 1 Frederick Russell Cruise 13/82 : Location of recording current meter (RCM) and thermistor chain (TC) moorings on La Chappelle Bank (A) for the period 3/9/82 to 12/9/82. Further details are given in Tables 1 and 2.

Fig 2 Frederick Russell Cruise 13/82 : Location of recording current meter mooring RCM1 south of the Isle of Wight (B) and the location (C) of seabed gravel mobility studies in the West Solent.

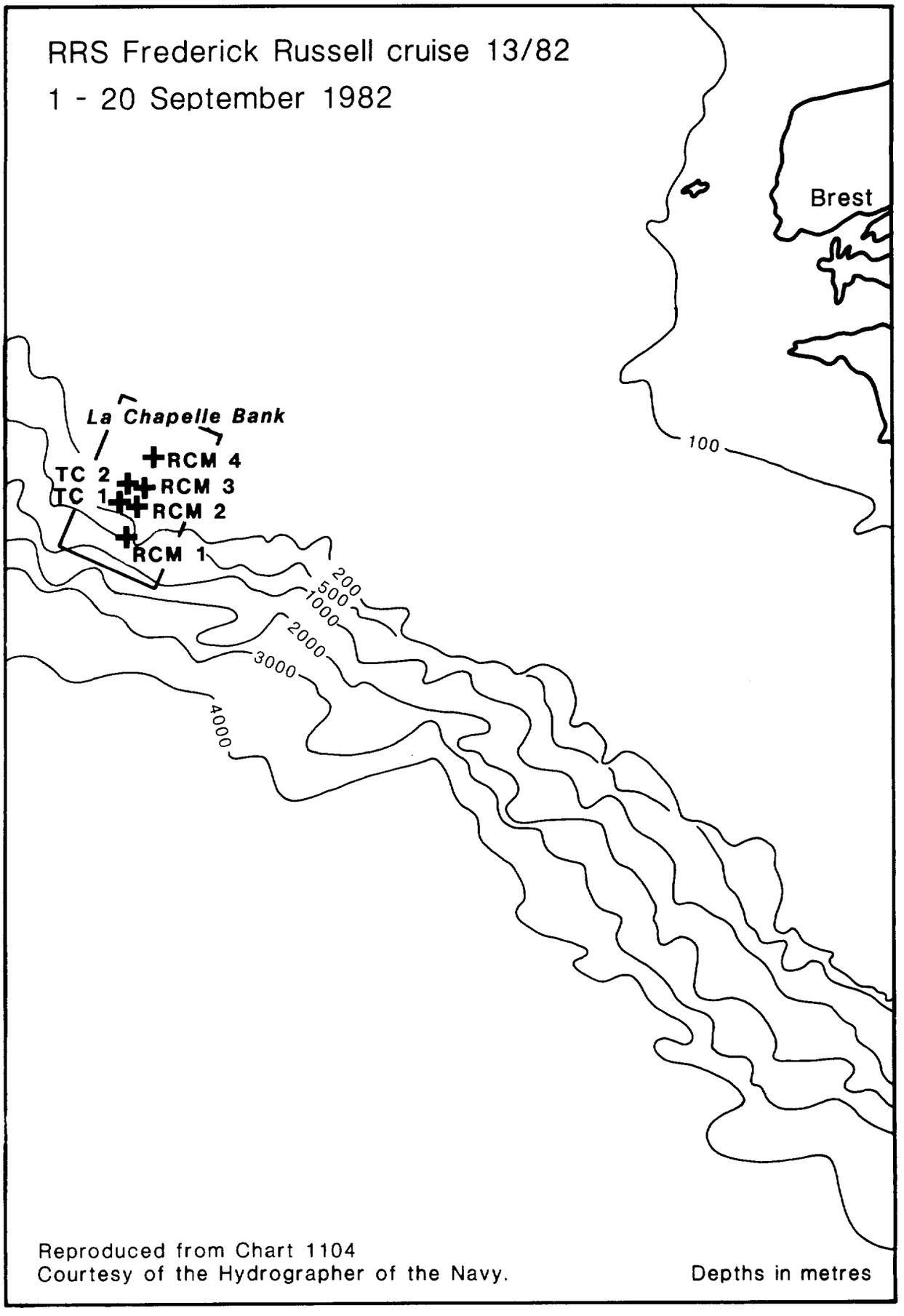
RRS Frederick Russell cruise 13/82
1 - 20 September 1982
Brest
La Chapelle Bank
RCM 4
TC 2
RCM 3
TC 1
RCM 2
RCM 1
100
200
500
1000
2000
3000
4000
Reproduced from Chart 1104
Courtesy of the Hydrographer of the Navy.
Depths in metres

Fig.1

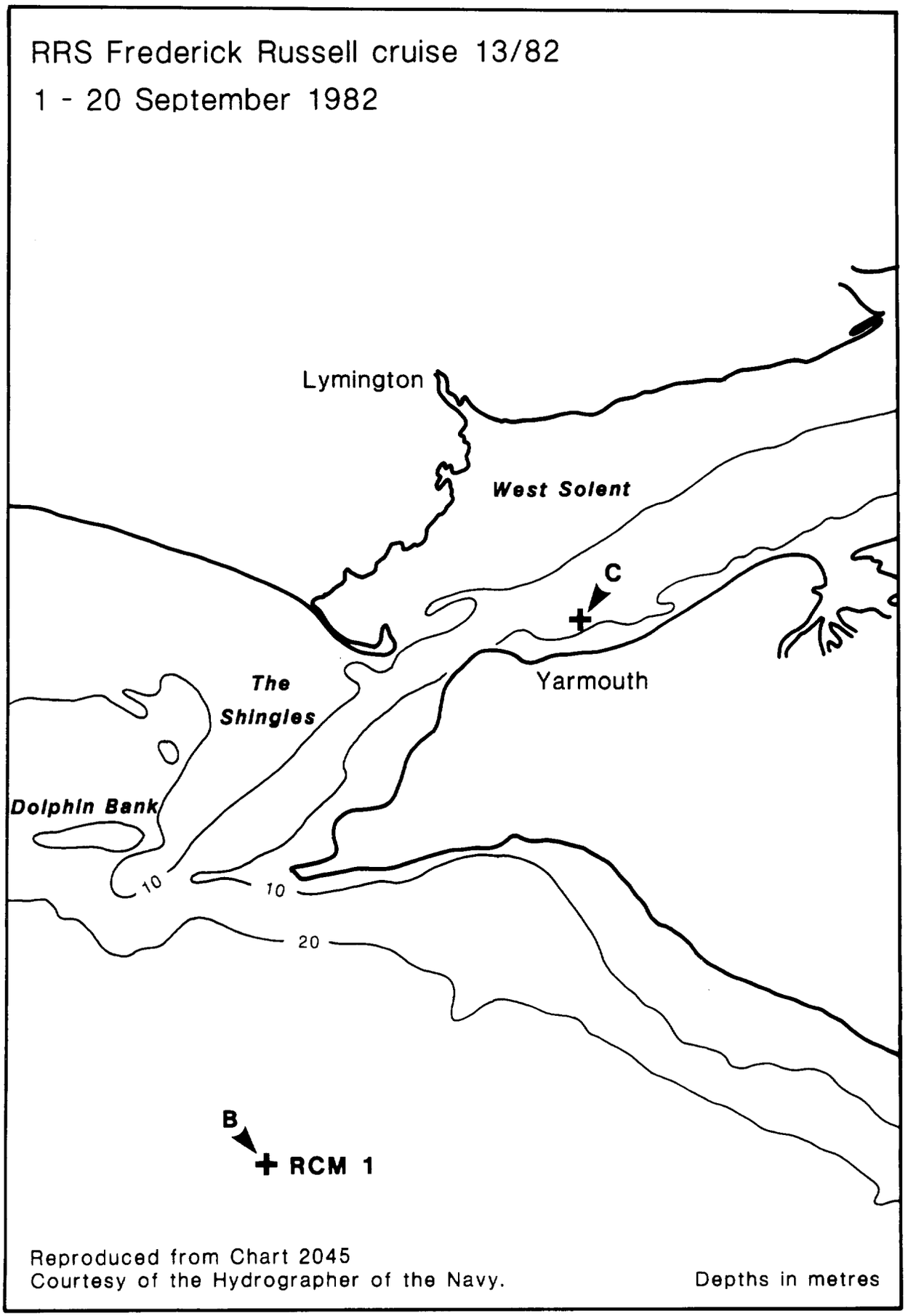
RRS Frederick Russell cruise 13/82
1 - 20 September 1982
Lymington
West Solent
C
Yarmouth
The
Shingles
Dolphin Bank
10
10
20
B
RCM 1
Reproduced from Chart 2045
Courtesy of the Hydrographer of the Navy.
Depths in metres

Fig. 2