

I.O.S.

R V EDWARD FORBES CRUISE 16/17

26 September—4 October 1977

INVESTIGATION OF TURBIDITY STRUCTURES IN
THE SEVERN ESTUARY AND INNER BRISTOL CHANNEL

CRUISE REPORT NO 93

1977

1980

NATURAL ENVIRONMENT
INSTITUTE OF OCEANOGRAPHIC SCIENCES
RESEARCH COUNCIL

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Institute of Oceanographic Sciences
Crossway
Taunton, Somerset.

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SCIENTIFIC PERSONNEL

R Kirby	SSO	Senior Scientist	26 September-4 October 1977
M A S Moore	SO		26 September-4 October 1977
P M Hooper	SO		29 September-4 October 1977
M R Lees	SO		29 September-4 October 1977
J G Henderson		Birmingham University	26 September-29 September 1977
M Whitehouse		" "	26 September-29 September 1977

SUMMARY

Trials with the Birmingham University towed body for the non-linear echo sounder and development trials of IOS equipment undertaken on the first few days. During the second leg of the cruise the relocation rigs and Barium Sulphate slurry markers were laid. Losses of survey time due to bad weather prevented any siltmeter work being accomplished.

OBJECTIVES

1. Cooperation with Birmingham University in high precision CSP equipment trials.
2. Establishing sedimentation rate experiment on settled mud area in Bridgwater Bay.
3. Measurement of suspended solids content and distribution variations by Time series cross sections along standard cross sections of the estuary.

NARRATIVE

Of the available 8 survey days 3 were lost due to the weather.

Three days were spent in trials with the Birmingham University towed body and non-linear echo sounder. The towing trials were unsuccessful. The body was relatively light with a large surface area and with moveable surfaces to control the behaviour. In fact very little control was possible and the body was unstable. A heavy transducer without control surfaces similar in design to the deep towed seismic devices would be preferable. The trial did not progress as far as making measurements with the echo sounder.

During the time when the towing trials were in progress, the experimental IOS bottom contact unit and vacuum samplers were tested.

The laying of the railway wheel rigs as site markers for the sedimentation experiment was accomplished satisfactorily and barium sulphate slurry was spread continuously onto the seabed during the laying operation.

ITINERARY

- 25.9.77. Travel to Barry and set up equipment on Edward Forbes. Birmingham University equipment installed. Depth sensors calibrated.
- 26.9.77. Sailed Barry 0800 for trials with Birmingham University towed body and vacuum sampler. Entered Barry 1930 owing to unfavourable forecast.
- 27.9.77. Sailed Barry 0815 for towed body trials. Fish hit bottom 1100 and was recovered damaged. Continued vacuum sampler trials at anchor. Entered Barry 2000 owing to unfavourable forecast.
- 28.9.77. Lost due to weather.
- 29.9.77. Sailed Barry 0830 to continue towed body trials in sheltered waters above Holm Islands. Entered Barry 1800.
- 30.9.77. Birmingham University equipment offloaded. Lost due to weather.
- 1.10.77. Sailed Barry 1000. Too rough for siltmeter work. Anchored in Barry roads and performed bottom contact unit and vacuum sampler trials. Entered Barry 1800.
- 2.10.77. Sailed Barry 1030 to Bridgwater Bay for trials of laying system for Barium Sulphate for sedimentation rate experiment. Decca Trisponder giving problems. Watchet aerial relocated. Entered Barry 2000 owing to unfavourable forecast.
- 3.10.77. Sailed Barry 0800 to Bridgwater Bay and anchored at site for Sedimentation rate experiment. Laid two railway wheel rigs, using Trisponder navigation, 10 m apart and spread Barium Sulphate slurry. Vacuum sampler trials continued in afternoon. Valve sealing problems solved. Gravity core sample obtained in settled mud area. Anchored Barry roads overnight.
- 4.10.77. Survey abandoned owing to unfavourable weather. Entered Barry 1000.
- 5.10.77. Offloaded IOS equipment and returned to Taunton.

EQUIPMENT PERFORMANCE

Ship's equipment

No problems with the ship's marine or scientific equipment were encountered.

Scientific equipment

1. The Decca Trisponder system worked well after the Watchet slave had been moved.
2. After initial problems with leaking seals on the bottles and a transformer of inadequate capacity to trigger the valves, the vacuum samplers worked well.
3. The bottom contact unit was developed to put "flags" onto magnetic tape for recording silt meter traverse . The unit worked following trials and modifications, but broke down towards the end of the trial. No operational measurements with siltmeters were made owing to weather delays.
4. The sedimentation rate experiment was established satisfactorily.

ACKNOWLEDGEMENT

We would like to thank the crew of Edward Forbes for their continued cooperation.

CRUISE REPORTS

<i>RRS "DISCOVERY"</i>	CRUISE DATES	REPORT NO.
CRUISE NO.	<i>RRS "CHALLENGER"</i>	
1 JUN — AUG 1963	AUG — SEP 1974	IOS CR 22
2 AUG — DEC 1963	MAR — APR 1976	IOS CR 47
3 DEC 1963 — SEP 1964	MAR — MAY 1978	IOS CR 72
	APR — 1979	IOS CR 81
	<i>MV "CRISCILLA"</i>	
	NOV — DEC 1978	IOS CR 73
	<i>RV "EDWARD FORBES"</i>	
4 FEB — MAR 1965	OCT 1974	IOS CR 15 X
TO TO	JAN — FEB 1975	IOS CR 19
37 NOV — DEC 1970	APR 1975	IOS CR 23
38 JAN — APR 1971	MAY 1975	IOS CR 32
39 APR — JUN 1971	MAY — JUN 1975	IOS CR 28
40 JUN — JUL 1971	JUL 1975	IOS CR 31
41 AUG — SEP 1971	JUL — AUG 1975	IOS CR 36
42 SEP 1971	AUG — SEP 1975	IOS CR 41
43 OCT — NOV 1971	FEB — APR 1976	IOS CR 48
44 DEC 1971	APR — JUN 1976	IOS CR 50
45 FEB — APR 1972	MAY 1976	IOS CR 53
46 APR — MAY 1972	AUG — SEP 1977	IOS CR 64
47 JUN — JUL 1972		
48 JUL — AUG 1972	<i>RRS "JOHN MURRAY"</i>	
49 AUG — OCT 1972	APR — MAY 1972	NIO CR 51
50 OCT 1972	SEP 1973	IOS CR 7
51 NOV — DEC 1972	MAY — APR 1974	IOS CR 9
52 FEB — MAR 1973	OCT — NOV	
53 APR — JUN 1973	& DEC 1974	IOS CR 21
	APR — MAY 1975	IOS CR 25
	APR 1975	IOS CR 39
	OCT — NOV 1975	IOS CR 40
	AUG — OCT 1975	IOS CR 42
	OCT — NOV 1976	IOS CR 53
	MAR — APR 1977	IOS CR 66
	JUL — SEP 1978	IOS CR 76
	<i>NC "MARCEL BAYARD"</i>	
	FEB — APR 1971	NIO CR 44
	<i>MV "RESEARCHER"</i>	
	AUG — SEP 1972	NIO CR 60
	<i>RV "SARSIA"</i>	
	MAY — JUN 1975	IOS CR 30
	AUG — SEP 1975	IOS CR 38
	MAR — APR 1976	IOS CR 44
	MAR 1977	IOS CR 63
	<i>RRS "SHACKLETON"</i>	
	AUG — SEP 1973	IOS CR 3
	JAN — FEB 1975	IOS CR 18
	MAR — MAY 1975	IOS CR 24
	FEB — MAR 1975	IOS CR 29
	JUL — AUG 1975	IOS CR 37
	JUN — JUL 1976	IOS CR 45
	OCT — NOV 1976	IOS CR 49
	JUL 1977	IOS CR 62
	JUL 1979	IOS CR 80
	<i>MV "SURVEYOR"</i>	
	FEB — APR 1971	NIO CR 38
	JUN 1971	NIO CR 39 X
	AUG 1971	NIO CR 42 X
	<i>DE "VICKERS VOYAGER" AND "PISCES III"</i>	
	JUN — JUL 1973	IOS CR 1

* Reports 1 to 3 were published and distributed by the Royal Society following the International Indian Ocean Expedition.

** NIO CR: National Institute of Oceanography, Cruise Report.

*** IOS CR: Institute of Oceanographic Sciences, Cruise Report.

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