IMER B/10/76
RVB 16/76

VESSEL RRS John Murray

CRUISE PERIOD 16-24 November 1976

PERSONNEL

P G Watson	SSO	Senior Scientist
J J Cleary	SSO	
R J Clifton	SSO	
R D Price	SO	

ITINERARY A sketch chart and list of station positions are attached.

Monday November 15 Travel to RVB Barry. Unload and install equipment.

Tuesday " 16 Depart Barry 1000. Proceed to Swansea Bay, station 1. En route check, calibrate and commission all scientific equipment. On station 1537. Bottom too hard for coring. Moved ¼ mile NW, Station 1A. Box core only could be taken, and water samples. Proceed to station 2, anchored at 1831. Analysis of samples collected completed at 2200.

Wednesday " 17 At anchor station 2. Coring commenced 0800. Bottom too stony, moved ¼ mile SW, station 2A. Coring proceeded in sandy mud. Water samples collected. Proceed to station 7 arriving 1255. Day grab and dredge samples taken. Proceed to station 4 Bridgwater Bay. Analysis of samples collected completed at 2200.

Thursday " 18 At anchor station 4. Water samples taken at hourly intervals 0830 to 1630. Analysis of samples completed at 2000 hours.

Friday " 19 At anchor station 4. Coring commenced 0800. At 1230 proceed to just off Barry to collect supplies of dry ice from Pilot boat. Proceed to station 6, anchor at 1336. Analysis of sediment samples complete at 2130.

Saturday " 20 At anchor station 6, on watch at 0830. Check equipment, prepare reagents etc. Commence water sampling at 0930. Sampling hourly to 1930 hours. Analyses complete at 2130.

Sunday " 21 At anchor station 6. Commence coring 0800. Proceed to station 5 at 1115. Anchor at 1200. Analysis of sediment cores continued to 2200.

Monday " 22 At anchor station 5. On watch 0830, completed analysis of sediment samples

collected. 1230 commenced water sampling hourly to 2030. Analyses complete at 2200.

Tuesday " 23 At anchor station 5. 0800 commenced coring. 1530 proceed to station 3 anchor at 1630. Analysis of sediment samples complete at 2245.

Wednesday " 24 NW winds force 5-6 forecast. Since this would seriously interfere with the sediment coring planned for the following day a condensed programme of sediment and water sampling was arranged. At anchor station 3. coring commenced 0700. Water sampling commenced 0820 and continued hourly until 1830. 1840 up anchor and proceed to Barry, lock in 2000. Analysis of sediment and water samples complete at 2000. Fast at Barry 2024.

Thursday " 25 Dismantle and load equipment. Return to Plymouth.

OBJECTIVES

A. Stations 1-6

(i) To study the geochemistry of the seawater sediment interface (Work Unit 7604).

(ii) To investigate the critical chemical processes which occur at this interface in relation to the water chemistry of estuarine systems.

(iii) To compare the chemistry at this interface in an area of active deposition (in Swansea Bay) and unstable areas (in Bridgwater Bay).

B. Station 7

To continue a regular sampling programme to measure the annual production at a Modiolus community.

PROCEDURES AND METHODS

1. Sediment samples were collected using a gravity barrel corer and a box corer. The barrel cores were kept vertical until the top section could be immobilised by freezing. It was thus possible to take cores up to ten feet long with an essentially undisturbed top. Replicate samples were frozen for return to Plymouth.

2. As soon as possible after sampling, the barrel core inside its plastic liner, was inserted into an oxygen-free nitrogen atmosphere box. The core was sectioned and Eh measurements made. Pore water extracted by centrifuging was filtered through a 0.45 um membrane. Box cores were too large to be handled in the nitrogen box. These were sub-sampled and centrifuged to yield larger volumes of pore water.

3. The following were determined on the filtered pore water: pH, chloride ion, alkalinity, sulphate, ammonia, phosphate, iron, zinc and tannin-lignin. Any residual pore water was stored, frozen for subsequent analysis at Plymouth.

4. Core samples were also sectioned and flushed with helium to extract gaseous hydrocarbons. These were adsorbed onto cooled activated charcoal and then desorbed for analysis by gas chromatography.

5. Seawater samples were collected from just below the surface and near to the bottom. Salinity, temperature and turbidity were determined just before sampling.

6. The following were determined on unfiltered water: pH, dissolved oxygen and particulate load. The following were determined on filtered water for comparison with the sediment pore water: alkalinity, sulphate, ammonia, phosphate, iron, zinc, Eh and tannin-lignin.

7. Samples of water from near to the bottom were also treated as in (4) above to extract and determine gaseous hydrocarbons.

8. At station 7, 15 Day grab samples were taken, sieved at 0.5 mm and preserved in formalin. Two Naturalist's dredge samples were taken and a representative part of each preserved in formalin.

EQUIPMENT PERFORMANCE

1. Failure of the NRPB radon counter after two days meant that it was only possible to make preliminary measurements in Swansea Bay.

2. Some initial problems with the amplifier unit of the gas chromatograph were resolved after two days.

3. The Spectronic Mini spectrophotometer proved somewhat erratic in use. This may be due to a sticking meter needle or to an intermittent switch fault.

4. Because of shipping regulations regarding the use of hydrogen gas the chromatograph was set up and operated in a 'container-laboratory' secured to the after-deck. This proved to be a satisfactory arrangement.

5. Failure of a brake pipe on the hydrographic winch caused a small delay during the grab sampling at station 7.

All other equipment performed satisfactorily.

RESULTS

Firm conclusions must await interpretation of the data acquired on the cruise, and additional and confirmatory analyses to be carried out on the samples brought back to Plymouth. A full report will be made at the end of the current work period.

The procedures worked out for handling samples subject to oxidative changes proved generally satisfactory. Except for the radon measurements all objectives were achieved.

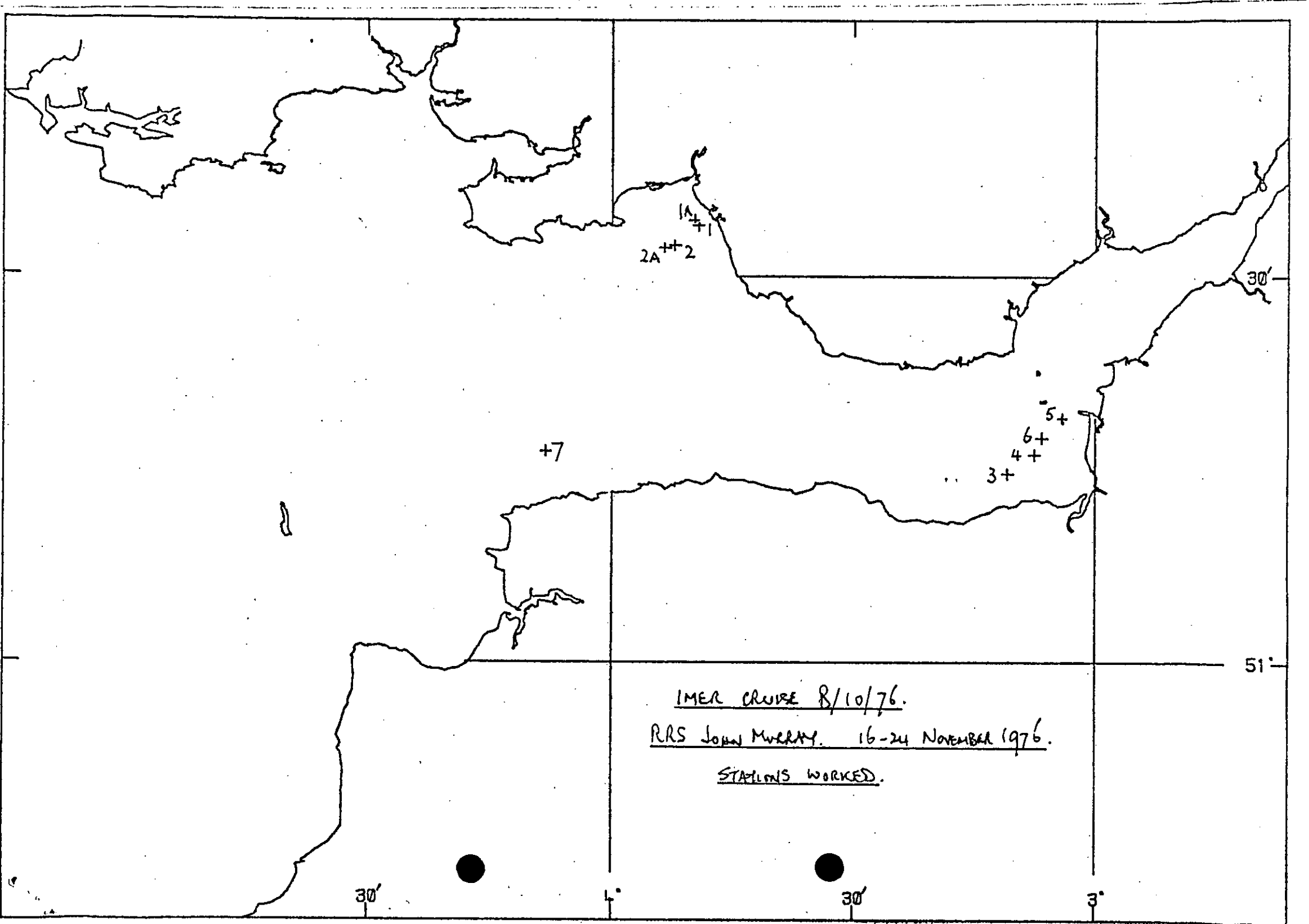
PREPARED BY : P G Watson

APPROVED BY : A R Longhurst

DATE : 7 December 1976

STATION LIST

Station No.		
1	51°33.8'N	03°49.2'W
1A	51°34.1'N	03°49.42'W
2	51°32.2'N	03°52.7'W
2A	51°32.18'N	03°52.9'W
3	51°14.4'N	03°11.3'W
4	51°16'N	03°7.4'W
5	51°18.8'N	03°4.2'W
6	51°17.25'N	03°6.5'W
7	51°16'N	04°08'W


1A
1
2A
2
30'
5
6
4
3
7
51°
IMER CRUISE 8/10/76.
RRS JOHN MURRAY. 16-24 NOVEMBER 1976.
STATIONS WORKED.
30'
4°
30'
3°

CIRCULATION LIST - BRISTOL CHANNEL

Internal

Glover
Longhurst
Hamilton
Robinson
Fay
File
Notice Board - (Brown)

External

NERC

Foxton
Director STS

IOS

Mrs Edwards (BODS)
Cartwright (Bidston)
Charnock (Wormley)
Tucker (Taunton)

IGS

Moore

MBA

Denton

SMBA

Currie

MAFF

Lee
Cushing
Wood

DAFS

Parrish

RVB

Stobie - (2)

DOE

Garnett, London

WRC

Eden, Stevenage

Welsh Office

Naylor Firth - (4)

ICI

Pearson

BRISTOL UNIVERSITY

Dineley
Eglinton

UNIVERSITY COLLEGE CARDIFF

Bellamy
Hammond

UWIST CARDIFF

Davies

UNIVERSITY COLLEGE SWANSEA

Banner
Knight-Jones
Nelson-Smith
Brooks
King

UNIVERSITY COLLEGE LONDON

Morris

IMPERIAL COLLEGE OF SCIENCE & TECHNOLOGY

Webb

UNIVERSITY OF LIVERPOOL

Abdullah

WATER AUTHORITY

Welsh National
Severn-Trent
Wessex
South West