IMER B7/77
RVB Ref. No. 9/77

VESSEL RRS JOHN MURRAY

CRUISE PERIOD 1-13 August 1977

PERSONNEL

A W Morris	PSO	Senior Scientist
J M Gee	PSO	
R F C Mantoura	SSO	
M B Jordan	HSO	
A J Bale	SO	
R J M Howland	SO	
T F Kendall	SO	
A J Pomroy	ASO	

ITINERARY A sketch chart and station list are attached to this report.

Sunday 31 July: 0900 Depart Plymouth, travel to Barry. Commence installation and commissioning of equipment to 1800.

Monday 1 August: Locked out of Barry 1115. Proceeded to position to relay moored current meter 1500. Proceeded to Station 5 for commencement of repetitive transects. Transects commenced 1545.

Tuesday 2 August: 0450 Anchor dropped at Station A. Vertical profiling of current velocity, salinity and turbidity started at 0530 to be continued at 45 min. intervals throughout occupation of Station A. 0830 Shipboard experiments and sampling begun, to be carried out daily 0800 to 2300 approximately.

Wednesday 3 August: 2030 current meter inoperative, replaced by spare at 2230. MC5 securing head damaged. Profiling suspended for repairs.

Thursday 4 August: 0830 Current recording recommenced without MC5 salinometer.

Sunday 7 August: 0230 Vertical profiling terminated. Depart Station A at 0310. Proceeded upestuary to reach Portishead region coincident with low water. Continuous and discrete sampling and analysis carried out. 0725 turn downestuary Station A passed at 1115. Continued along cruise track 1. 1800 track 1 completed. 1810 sampling of Swansea Bay grid commenced at Station 9. 2150 Swansea Bay grid completed, proceeded to Station B and anchored. Servicing, recalibrations etc., to all equipment carried out.

Monday 8 August: 0800 Commenced sampling along track 2 as far as Helwick Light then moved off line for trawling in Carmarthen Bay. Two half-hour trawls taken. Catch identified, sized and counted. Track 2 adjusted for requirements of Ships Master to rendezvous at Mumbles for supplies. The most westerly, south-going transect reduced by ~ 15 miles, and direct route from Barnstaple Bay to Swansea Bay taken. See attached chart.

Tuesday 9 August: 0745 tracking in Barnstaple Bay, beam broken on retrieval; catch was identified, sized and counted. 1200 readjusted survey track 2 completed. Two trawls attempted in Swansea Bay grid region. Net damaged on each occasion. Partial trawls identified, sized and counted. 1815 Occupied station B. Sampling, recording and experiments as for Station A. Coring attempts unsuccessful - sediment compact and stony.

Friday 12 August: 0600 Departed anchor station B. Trawling in Swansea Bay Grid again affected by torn nets. Coring attempts off Margam Warren unsuccessful.
1035 coverage of Swansea Bay grid commenced at station 9, completed 1355.
1400 further sites for trawling surveyed off Port Talbot. Trawl empty on hauling.
1600 sampling off Port Talbot grid commenced. Radar fixes used for station positions - Decca unreliable. 1745 Port Talbot stations completed.
1920 return track 1 commenced.

Saturday 13 August: Return track 1 completed at 0155. Repetitive sampling through stations 1 to 5 commenced completed 1430. Proceeded to Barry to pick up pilot and drop 3 scientists to transfer transport to Cardiff. ca 1800 locked in Cardiff. Commenced unloading.

Sunday 14 August: Completed unloading 1000. Travelled to Plymouth.

OBJECTIVES

(a) To measure the spacial variability of dissolved organic and inorganic nutrients, phytoplankton and zooplankton.

(b) To measure the fluxes of organic and inorganic nutrients between phytoplankton, heterotrophic microbes and omnivorous zooplankton and to measure the rates of primary and secondary production.

(c) To make current meter measurements at two stations as a reconnaissance for long-term deployment of current meters.

(d) To carry out preliminary trawling in Swansea and other Bays.

PROCEDURE AND METHODS

The methods used were those outlined in the cruise programme.

(a) Experiments were done at stations A and B to measure rates of production of phytoplankton and zooplankton. The following measurements were made along tracks 1 and 2 and upestuary traverse, on a line transect through stations 1 to 5 for one tidal cycle at the beginning and end of the cruise, and at stations B on a grid of stations 9 to 24 at the beginning and end of the experimental period: salinity, temperature, particle load, light intensity, silicate, nitrate, phosphate, nitrite, dissolved organic carbon and chlorophyll. Copepods were sampled by pump using a deck mounted serial collecting system and by oblique hauls with a Lowestoft sampler.

(b) At the experimental station A and B, water samples were maintained at ambient temperature and the following measurements made at regular time intervals:

(i) dissolved organic carbon
(ii) numbers of heterotrophic microbes
(iii) Assimilation rates of ^{14}C glucose by microbes.

Daily measurements were made of the rates of primary production, utilisation of inorganic nutrients and excretion of organic carbon by phytoplankton.

Grazing experiments were done with known numbers and species of zooplankton feeding on unialgal cultures and natural particulate matter labelled with $^{14}CO_2$ and ^{3}H glucose to measure the grazing on phytoplankton and bacteria. The excretion of dissolved organic matter by copepods and mysids was measured and the respiration rates determined by Winkler titrations.

(c) A direct reading current meter was deployed for vertical profiling at station A and station B, measurements being taken at 45 min., intervals.

EQUIPMENT PERFORMANCE

The trawling trials highlighted two major points:
(a) the equipment used was too flimsy for general use and a much stronger beam trawl should be acquired, with stronger netting.
(b) the ground within the experimental area in Swansea Bay is very unreliable ranging from mud to boulder with occasional spoil deposits. Even using a preliminary echo-sounder survey before trawling, good quantitative results are unlikely to be obtainable.

The automatic scan coupling to the recorder of the SP 1800 spectrophotometer was inoperative - manual switching was used.

One MC5 salinometer head was damaged during use; reparable in laboratory.

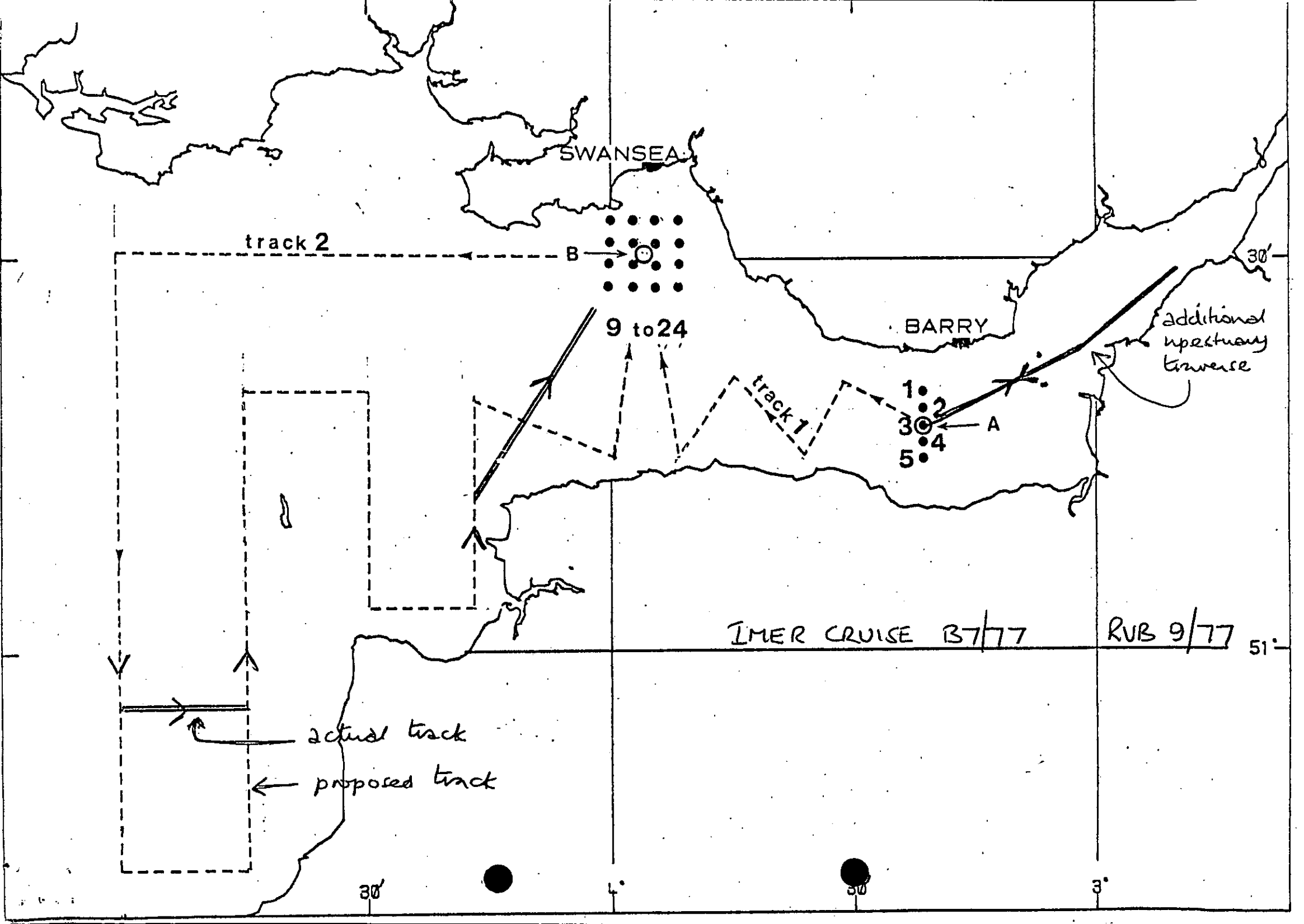
One Flygt pump was only just able to cope with all equipment demands when working at optimum efficiency - two Flygt pumps or larger capacity pump should be deployed on future cruises of this type.

Braystoke current meter failure during use was due to breakdown of reed switch in velocity circuit. Replaced by Plessey DRCM.

Prepared by: A W Morris

Approved by: A R Longhurst

Date: 5 September 1977


SWANSEA
BARRY
track 2
B
9 to 24
track 1
1
2
3
4
5
A
additional upestuary traverse
IMER CRUISE B7/77
RVB 9/77
actual track
proposed track
30'
4°
30
3°
51°

STATION LIST

	Lat.N	Long. W
A	51° 18'	03° 21'
B	51° 31'	03° 56'
1	51° 20.5'	03° 21'
2	51° 19.25'	03° 21'
3	51° 18'	03° 21'
4	51° 16.75'	03° 21'
5	51° 15.5'	03° 21'
9	51° 29'	04° 00.5'
10	51° 30.3'	04° 00.5'
11	51° 31.7'	04° 00.5'
12	51° 33'	04° 00.5'
13	51° 33'	03° 57.3'
14	51° 31.7'	03° 57.3'
15	51° 30.3'	03° 57.3'
16	51° 29'	03° 57.3'
17	51° 29'	03° 55.2'
18	51° 30.3'	03° 55.2'
19	51° 31.7'	03° 55.2'
20	51° 33'	03° 55.2'
21	51° 33'	03° 53'
22	51° 31.7'	03° 53'
23	51° 30.3'	03° 53'
24	51° 29'	03° 53'

CIRCULATION LIST - BRISTOL CHANNEL

Internal

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

External

NERC

Foxton
Director STS - NERC-Lond

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

Graham, 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

IMPERIAL COLLEGE OF SCIENCE & TECHNOLOGY

Webb

UNIVERSITY OF LIVERPOOL

Abdullah

WATER AUTHORITY

Welsh National
Severn-Trent
Wessex
South West