VESSEL RRS JOHN MURRAY

CRUISE PERIOD 11-25 January 1978

PERSONNEL

A W Morris	PSO	Senior Scientist
M B Jordan	HSO	
A J Bale	SO	
R J M Howland	SO	
T F Kendall	SO	
Mrs S V Mann	SO	
Miss T D Budd	ASO	
A J Pomroy	ASO	

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

Tuesday 10 January — Travel to Barry. Commence installation and commissioning of equipment.

Wednesday 11 " — Lock out Barry 0930. Delay precipitated change in programme. Commence Avonmouth run (track 3) immediately. 1615 Commence down-estuary leg. 2130 Track 3 completed. Commence repetitive transects through Stations 1 to 5. Plankton net tows not deployed because of adverse weather.

Thursday 12 " — 1111 Transects through Stations 1 to 5 completed. Moored current meter rig not in position - search initiated. Part of rig in close vicinity of Breaksea Lightship retrieved. 1830 Lock in Barry to pick up grappling gear and spare parts for DOC equipment.

Friday 13 " — 0700 Lock out Barry. Proceed to area of buoyed current meter and commence grappling. 1500 Search abandoned and replacement rig successfully positioned. 1800 Proceed to Anchor Station A and commence recording and experiments.

Wednesday 18 " — 1530 Experimental work at Station A successfully completed. Proceed to Barry vicinity to pick up cylinder of CO_2 standard gas. 1812 Depart Station A to proceed along track 1. 2245 Track 1 completed. Commence sampling of Swansea Bay grid.

Thursday 19 January		0020 Swansea Bay grid sampling abandoned due to adverse weather conditions. Proceed to N. Somerset coast for shelter. Anchor overnight off Porlock. 0800 In view of weather, a second run along track 3 was initiated since work down-estuary was not feasible. 0945 Commence second Avonmouth track.
Friday 20	"	0030 Track 3 repeat successfully completed. Proceed to Swansea Bay. 0709 Commence Swansea Bay grid sampling Stations 9 to 24. 1037 Swansea Bay Grid completed successfully. Proceed to Port Talbot region to collect large volume samples. 1207 Sampling completed . Proceed to track 2. 2210 track 2 readjusted to reduce effects of wind and swell on performance (see attached sketch chart)
Saturday 21	"	1500 Readjusted track 2 terminated in Barnstaple Bay. Proceed to anchor off Clovelly. In view of impending weather, anchor station experiments were commenced here rather than attempt to occupy Station B.
Sunday 22	"	Anchor station off Clovelly abandoned for 1 day steaming due to wind direction. Experiments continued.
Tuesday 24	"	0715 Depart Clovelly. Proceed to Swansea Bay and sample grid Stations 9 to 24. Proceed to Stations 1 to 5 for 13 hour repetitive run. 1830 Stations 1 to 5 commenced
Wednesday 25	"	0700 Stations 1 to 5 completed. Proceed to Barry. 0830 Arrive Barry. Commence unloading. Pack vehicles and return to Plymouth.

OBJECTIVES

(a) To measure the spatial 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. The methods used were those outlined in the cruise programme.

PROCEDURE AND METHODS

(a) Experiments were done at Stations A and off Clovelly to measure rates of production of phytoplankton and zooplankton. The following measurements were made along tracks 1,2 and 3, on a line transect through Stations 1 to 5 for one tidal cycle at the beginning and end of the cruise, and at station 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 off Clovelly 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 respiration rates determined by Winkler titration.

(c) A direct reading current meter was deployed for vertical profiling at Station A measurements being taken at 45 min. intervals for 5 days.

EQUIPMENT PERFORMANCE

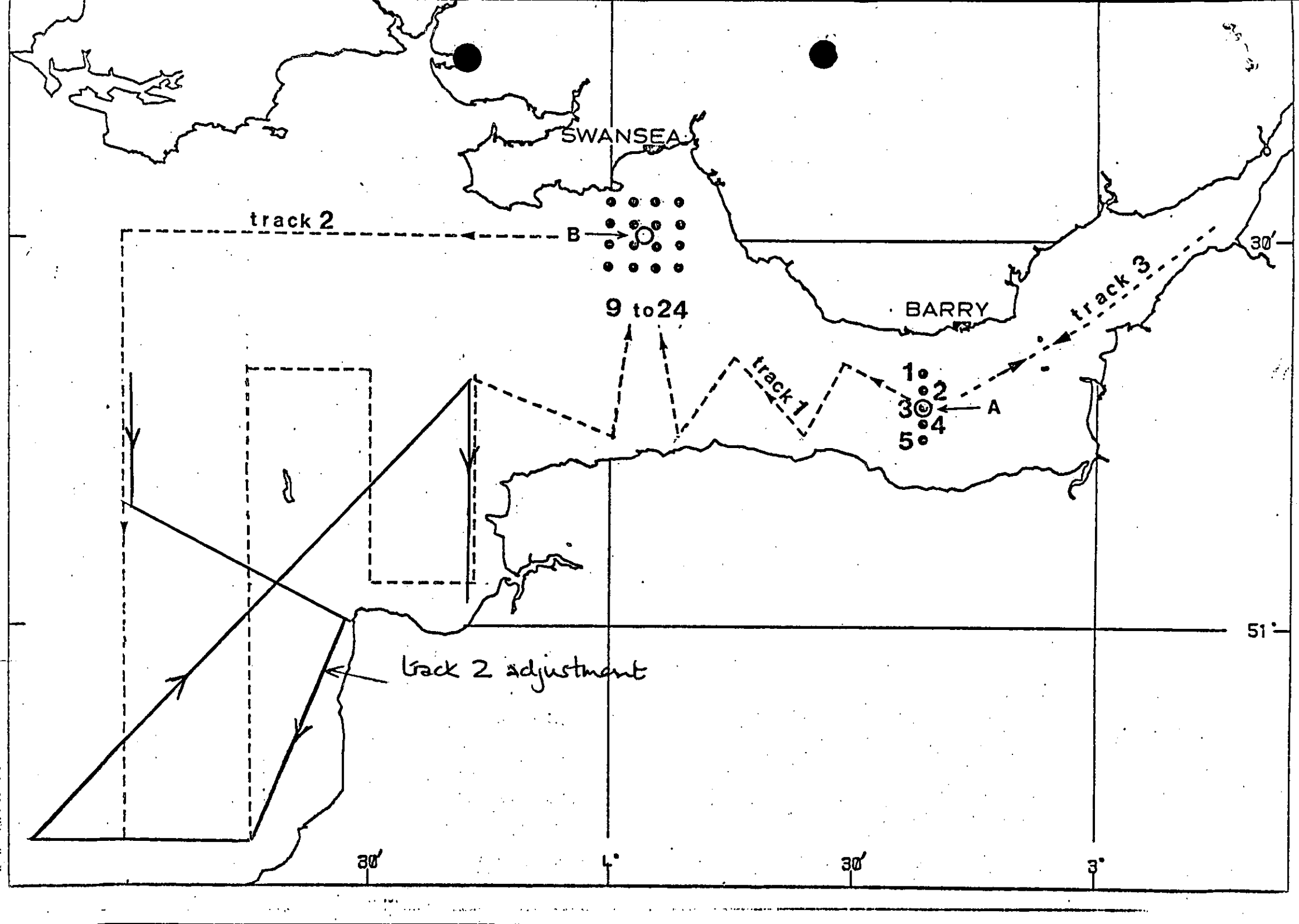
Problems were encountered with the IR analyser used in the dissolved organic carbon system. Intermittent fault necessitated occasional sampling and storage rather than immediate analysis.

A failure in the cable of the DRCM was located to a previous break and repair. Temporary repair operated satisfactorily for remainder of cruise.

Prepared by: A W Morris
Approved by: R S Glover
Date: 14 February 1978

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'


SWANSEA
BARRY
track 2
B
9 to 24
track 1
track 3
1
2
3
4
5
A
track 2 adjustment
30'
4°
30'
3°
51°
30'

CIRCULATION LIST - BRISTOL CHANNEL

Internal

Glover

Hamilton
Robinson
Fay

File
Notice Board - (Brown)

External

NERC

Foxton
Director STS - NERC-Lo...

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

Knight-Jones (3)

IMPERIAL COLLEGE OF SCIENCE & TECHNOLOGY

Webb

UNIVERSITY OF LIVERPOOL

Abdullah

WATER AUTHORITY

Welsh National
Severn-Trent
Wessex
South West