IMER B/4/77
RVB 5/77

VESSEL RRS John Murray

CRUISE PERIOD 3-15 May 1977

I R Joint	SSO	Senior Scientist
M B Jordan	HSO	
P H Burkill	HSO	
A J Bale	SO	
R M Howland	SO	
T Kendall	SO	
A J Pomroy	ASO	

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

Tuesday	May	3	Locked out Barry 0930. Laid tide gauge at 1130 at 51° 13'N, 03° 16' W. Began sampling on line transect through stations 1 to 5 at 1315; continuous sampling for 13 transects.
Wednesday	"	4	Transects finished at 0117. Anchored at station A and current meter measurements began at 0400 and continued at 45 minute intervals. Sampling and experimental work began at 0800 and completed at 2300.
Thursday	"	5	Sampling and experiments from 0800 until 2300.
Friday	"	6	Sampling and experiments from 0800 until 2330.
Saturday	"	7	Sampling and experiments from 0800 until 2300.
Sunday	"	8	Sampling and experiments from 0800 until 2300.
Monday	"	9	Current meter measurement completed at 0620. Tide gauge recovered at 1145. Continuous sampling began on track between stations A and 9 at 1230. Continuous sampling on grid began at station 9 at 1730 and completed at station 24 at 2100. Anchored at station B at 2135. Current meter measurements began at 2210 and continued at 45 minute intervals.
Tuesday	"	10	Fault developed in current meter and readings stopped at 2000.
Wednesday	"	11	Sampling and experimental work began at 0800. Ship called into Swansea for diver examination of propellor stern gland. Experimental work continued until 1950.
Thursday	"	12	Docked out Swansea 1100, entered Barry dry dock at 1700.

Friday " 13 Left Barry dry dock 1745; continuous sampling on grid began at station 9 at 2030 and completed at station 24 at 2345.

Saturday " 14 Began continuous sampling on line transect through station 1 to 5 at 0835; 13 transects completed at 2135.

Sunday " 15 Locked in Barry 0750.

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.

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. To confirm these rates the following measurements were made 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, 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 bacterial. The excretion of dissolved organic matter by copepods and mysids was measured and respiration rates determined by Winkler titrations.

(c) A direct reading current meter was deployed for 10 tidal cycles at station A and for 2 tidal cycles at station B.

EQUIPMENT AND OTHER FAILURES

The blade of the propellor of the Braystoke direct reading current meter sheared after 12 hours on station A; readings continued with the Plessey DRCM, although the short cable prevented measurements near the bottom of the water column at high water. The propellor spindle of the Plessey DRCM broke after one day at station B and current measurements were abandoned.

The ship was recalled to Swansea on the second day at station B because of a severe leakage of oil from the propellor stern gland. This could not be repaired by divers and the ship was recalled to Barry dry dock. Therefore, only 36 hours of the 5 days planned at station B could be worked, although some experimental work continued in dock with water and zooplankton samples taken at station B.

All other objectives were completed successfully.

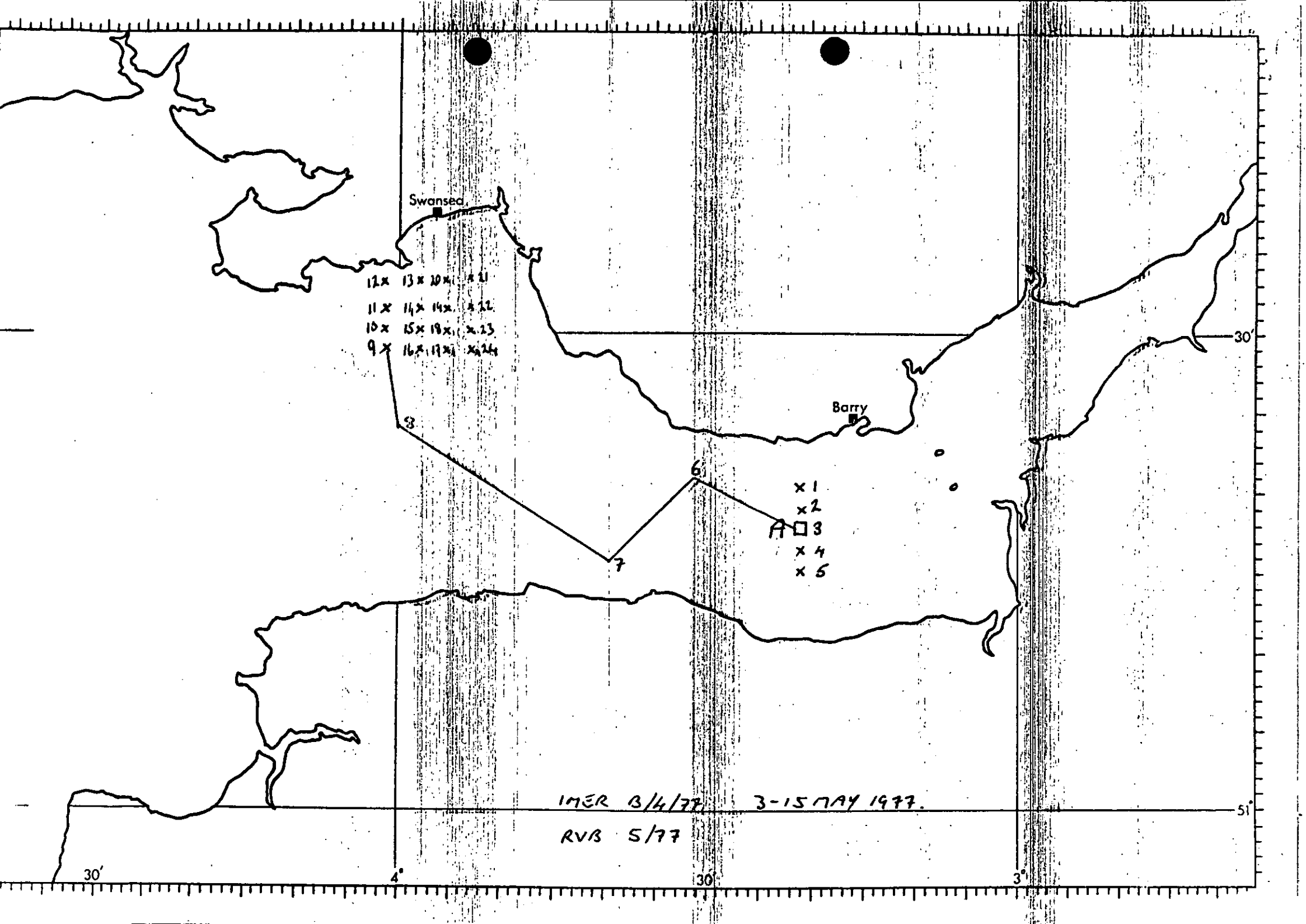
PREPARED BY: I R Joint

APPROVED BY: A R Longhurst

DATE : 19 May 1977

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'
6	51° 21'	03° 31'
7	51° 16'	03° 39'
8	51° 24.5'	03° 59'
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'



IMER 8/4/77 3-15 MAY 1977.

RVB 5/77

CIRCULATION LIST - BRISTOL CHANNEL

Internal

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

External

NERC

Foxton
Director STS - NERC-London

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

IMPERIAL COLLEGE OF SCIENCE & TECHNOLOGY

Webb

UNIVERSITY OF LIVERPOOL

Abdullah

WATER AUTHORITY

Welsh National
Severn-Trent
Wessex
South West