Roscop NO. 1769

INSTITUTE FOR MARINE ENVIRONMENTAL RESEARCH CRUISE REPORT

IMER B/2/77
RVB 3A/77

VESSEL: RRS "SHACKLETON"

CRUISE PERIOD: 8-19 February 1977.

PERSONNEL:

I R Joint	SSO	Senior Scientist
W W Brown	SSO	
M B Jordan	HSO	
P H Burkill	HSO	
R F C Mantoura	HSO	
A J Bale	SO	
R M Howland	SO	
T Kendall	SO	

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

Tuesday	February	8	Locked out Barry 0800. Began sampling on line transect through stations 1 to 5 at 1247; continuous sampling for 10 transects.
Wednesday	"	9	Transects finished at 0145. Anchored at station A and current meter measurements began at 0230 and continued at 45 minute intervals. Sampling and experimental work began at 0800 and completed at 2330.
Thursday	"	10	Sampling and experiments from 0800 until 2330.
Friday	"	11	Sampling and experiments from 0800 until 2330.
Saturday	"	12	Sampling and experiments from 0800 until 2200.
Sunday	"	13	Sampling and experiments from 0800 until 2300.
Monday	"	14	Current meter measurements completed at 0500. Continuous sampling began on track between stations A and 9 at 0545. Continuous sampling on grid began at station 9 at 1100 and was completed at station 24 at 1600. Anchored at station B at 1700.
Tuesday	"	15	Current meter measurements began at 0230 and continued at 45 minute intervals. Sampling and experimental work began at 0800 and completed at 2330.
Wednesday	"	16	Sampling and experiments from 0800 until 2200.
Thursday	"	17	Sampling and experiments from 0800 until 2200. Current meter measurements finished at 2230.

Friday February 18 Sampling and experiments from 0800 until 1730. Continuous sampling began at 1800 on the grid from stations 24 to 9; grid completed at 2136.

Saturday " 19 Began continuous sampling on line transect through stations 1 to 5 at 0540; 10 transects completed at 1725. Locked in Barry 1815.

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 2 stations as a reconnaissance for long-term deployment of current meters.

PROCEDURES 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: 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. Measurements were made on the line transect through stations 1 to 5 for one tidal cycle at the beginning and at the end of the cruise. At station B the grid of stations 9 to 24 was sampled once at the beginning and again at the end of the experimental period.

b) At the experiment stations 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 on bacteria. The excretion of dissolved organic carbon and primary amines by microzooplankton, copepods and mysids was also determined. Respiration rates were measured by Winkler titration.

One sediment core was taken at stations A and B and the rate of oxygen consumption was measured: the concentration of dissolved organic carbon in the interstitial pore water was measured.

c) A direct reading current meter was deployed for 10 tidal cycles at station A and for 5 tidal cycles at station B.

EQUIPMENT AND OTHER FAILURES: The blades of the impeller of the direct reading current meter were smashed in a heavy sea after 3 days measurement at station B. However, sufficient data had already been obtained and the loss of the additional two days data was not serious. The fluorometer used for continuous measurement of chlorophyll fluorescence stopped working after 12 hours. However, some discrete measurements of fluorescence were obtained with a second fluorometer and samples were filtered for subsequent spectrophotometric determinations of chlorophyll. The autoanalyser system for the analysis of ammonia lost sensitivity after 3 days, probably because of contamination of one of the reagents, and could not be used for the rest of the cruise. The Lowestoft sampler could not be used on the second sampling of the grid of stations 9 to 24 because of heavy seas.

RESULTS: The experimental period at station B was shortened by one day and the second sampling track of stations 6, 7 and 8 was omitted because of bad weather. All other objectives were completed successfully.

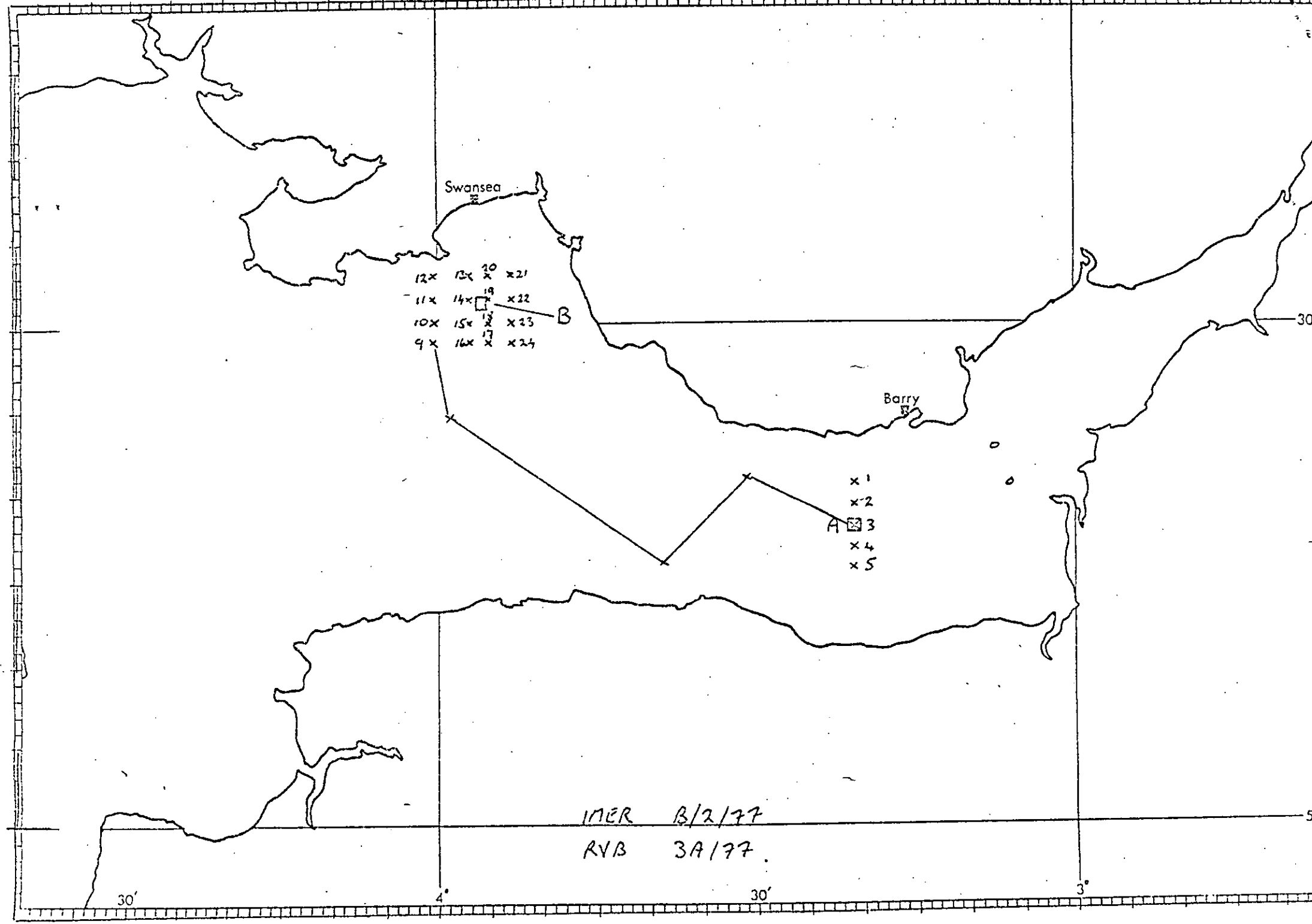
Prepared by : I R Joint

Approved by : A R Longhurst

Date : 2 March 1977

STATION LIST

	Lat. N	Long. W
A	51°18'	03°21'
B	51°31.3'	03°55.4'
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 B/2/77

RVB 3A/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

UNIVERSITY COLLEGE LONDON

Morris

IMPERIAL COLLEGE OF SCIENCE & TECHNOLOGY

Webb

UNIVERSITY OF LIVERPOOL

Abdullah

WATER AUTHORITY

Welsh National
Severn-Trent
Wessex
South West