RVS Ref. No. FR 1183
IMER C1/83

VESSEL	RRS Frederick Russell
CRUISE PERIOD	4 to 9 January, 1983. (Changed to 6 to 9 January on 24.12.82 - notification through R. Young, MBA).
PERSONNEL	R. Williams PSO (Senior Scientist) I Joint PSO S Coombs SSO D V P Conway SSO A Pomroy SO

ITINERARY

5 January		Loaded equipment at Plymouth.
6 January		Delayed sailing due to weather conditions.
7 January	10.41h	Departed Plymouth and set course for Station CS2 (50° 30'N 07° 00'W).
8 January	02.05h	Force 8 heavy weather conditions, anchored in Crow Sound, Scilly Isles.
	08.12h	Weather moderated, left Crow Sound and set course for CS2.
	09.13h	Deployed UOR.
	13.49h	Recovered UOR at Station CS2.
	13.58h	Series of water bottle casts.
	14.27h	PES III fish deployed.
	14.29h	XBT.
	15.04h	LHPR deployed.
	15.20h	Winch failed to haul LHPR.
	18.00h	Recoverd LHPR. Weather conditions deteriorating.
	18.40h	½ m nets deployed off stern.
	20.05h	Net work completed.
	20.30h	Set course for Plymouth. UOR deployed.
	21.10h	UOR inboard.
9 January	12.58h	Docked Plymouth.
10 January	a.m.	Unloaded equipment.

OBJECTIVES

To carry out a winter baseline study at the Celtic Sea (CS2) site.

1) To continue a seasonal series of measurements of physical (light, temperature, salinity), chemical (nutrients) and biological (phytoplankton, chlorophyll and zooplankton) numbers and somatic condition) variables.

2) To establish winter variables for primary production and bacterial (heterotrophic) production for comparison with summer/autumn determinations.

3) To determine the vertical distribution and abundance of the wintering copepodite stages of Calanus.

4) To obtain living material for length/dry weight, gut analysis, carbon, nitrogen content, lipids and extracellular enzyme activity of Calanus.

PROCEDURES AND METHODS

OUTLINED IN CRUISE PROGRAMME IMER C1/83

EQUIPMENT AND OTHER FAILURES

Gale force winds delayed sailing until 7 January. Steaming into a westerly Gale 8 increased our passage time and deteriorating weather eventually forced us to seek shelter in Crow Sound. This delayed our arrival at Station CS2 until 13.49h when it was too late in the day to start a ^{14}C incubation experiment. This part of the programme was abandoned.

Following the deployment of the LHPR to its maximum depth the dredge winch failed to recover warp under load leaving the LHPR 5 m off the sea-bed (300 m of warp out in 110 m of water with the ship steaming at 4 knots). All efforts by the bosun and engineers failed to rectify the problem. The warping capstans, which could have been used to recover the warp, were not functioning. If I understand the problem correctly the wrong hydraulic pipes were fitted during the refit. The problem was eventually solved by cutting the main warp after it was held by two chain stoppers and leading the wire to the hydrographic winch where it was joined to the hydrographic wire. The hydrographic winch was then used to recover the LHPR. It must be stated that this recovery probably would not have been feasible if the LHPR system had been deployed in deep water (2000 m+) off the shelf. In these circumstances the failure of this winch could have easily caused the loss of the LHPR system.

Back in port on Monday 10 I discussed the problem of the dredge winch with Mr. J. Taylor (RVS). I understand from him that when he removed the 2 trawl winches prior to our cruise he set the hydraulics to operate the hydrographic winch only. He mentioned this to Mr. N. Jonas as standby officer for the 'Frederick Russell'; Mr. Taylor wrongly assuming that Mr. Jonas would be sailing with our cruise. The result of Mr. Taylor's load test on the winch showed that the power loss to the winch could be corrected by turning the valve to the correct position. Unfortunately no one informed me or any other officer prior to our sailing of the necessity to change this valve.

Fortunately we recovered the system successfully but the reverse could have applied with the loss of expensive equipment.

The hydrographic winch and gantry were used to deploy the UOR. It provided a safe and rapid method for launching and recovering the UOR. Unfortunately the position of the towing point was too far forward and this allowed the towing wire to stray underneath the ship which made this method of deployment unsuitable for the UOR. Since the aft gantry on the RRS Frederick Russell is not suitable for control of the UOR, except under favourable weather conditions, it is essential to arrange a new system if the UOR is to be used on this vessel. It is suggested that a winch similar in construction to the PES III winch be used specifically for the deployment of the UOR.

RESULTS

Two valid UOR tows were taken between the Scillies and the Celtic Sea station, totalling 4h 39 min of sampling. The undulation servo control mechanism and sensor/recording electronics functioned satisfactorily. However, data recovery through the replay system was very poor, at <40%, probably due to incorrect electronic adjustment of the replay module. The UOR was re-programmed for a deeper undulation pattern and deployed on leaving the Celtic Sea site. After 30 minutes towing the strain gauge record indicated a constant depth tow and the UOR was recovered. The fault was identified as an incorrect programming of the sensor unit. In view of the deteriorating weather conditions and inadequate towing arrangements no further UOR deployments were attempted.

One bottle cast (9 depths) was taken and water samples analysed for chlorophyll, salinity, nutrients, DOC, bacteria, flagellates and phytoplankton. Production of bacteria in these samples was measured using 3H Thymidine.

Two hundred Calanus (copepodite stage V) were sorted and frozen for determination of lipids and extra-cellular enzyme activity and approximately 100 Calanus were photographed and dried for analyses of dry weight and carbon and nitrogen content.

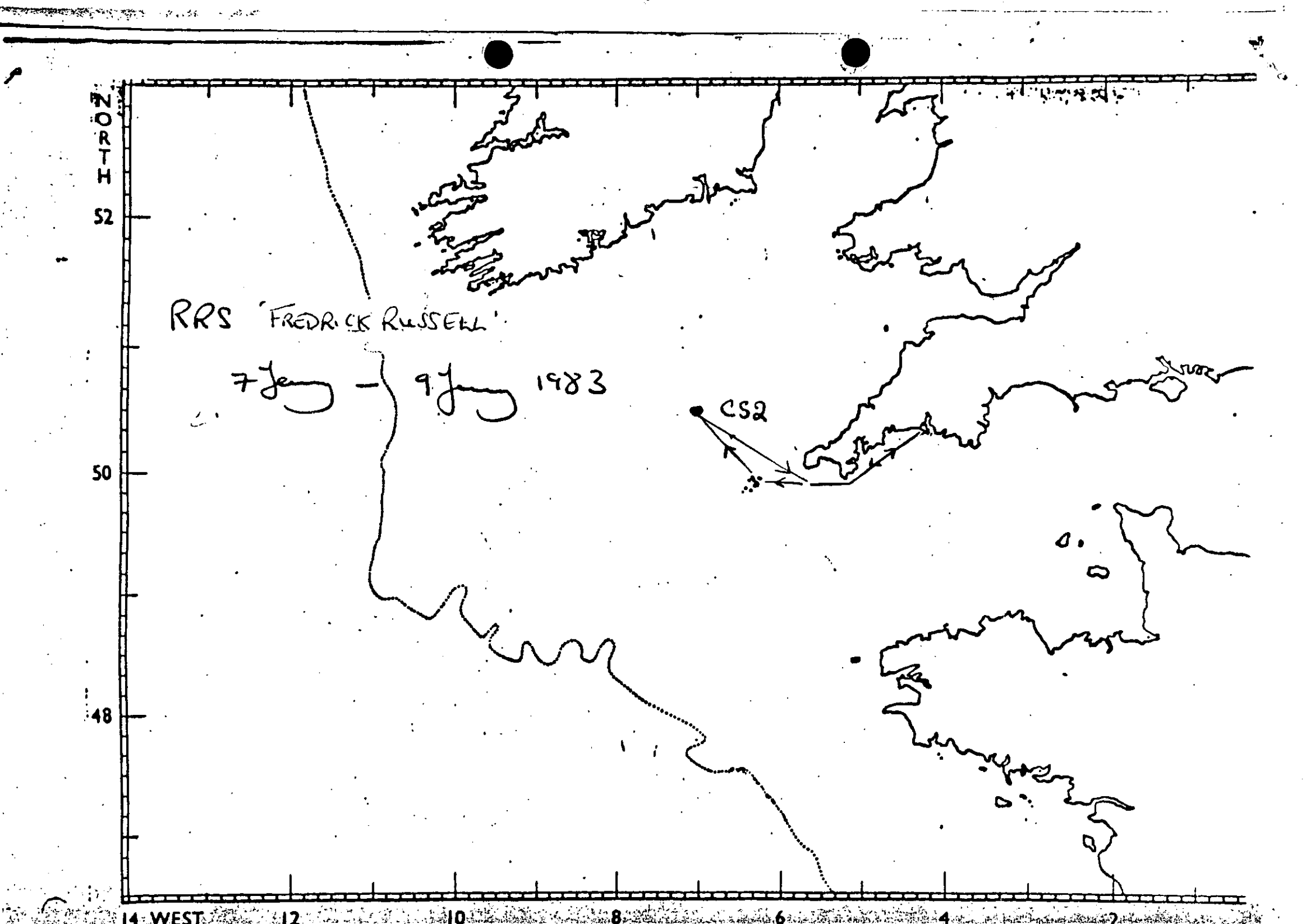
Prepared by: R. Williams

Approved by: B. L. Bayne

Date: 10 January 1983

Circulation list: Internal: R.S. Glover, B.L. Bayne, G.A. Robinson, R. Williams, I. Joint, D.V.P. Conway, S. Coombs, A. Pomroy, Notice Board, File.

External: NERC Foxton (Swindon)
RVS Skinner (Barry)
IOS Mrs Edwards (MIAS)
MBA Denton
DAFS McIntyre
MAFF Harden-Jones


NORTH
52
50
48
RRS 'FREDRICK RUSSELL'
7 Jan – 9 Jan 1983
CS2
14 WEST
12
10
8
6
4
2