

VESSEL RRS CHALLENGER

CRUISE PERIOD 11 January - 18 January, 1982

PERSONNEL R. Williams PSO (Senior Scientist)
D.V.P. Conway HSO
N.R. Collins HSO
P. Leahy Dept. of Oceanography, Galway University.

ITINERARY

Monday 11 January 08.45 hrs; departed Barry for Celtic Sea Station 1 (Fig. 1).
19.00 hrs; commenced programme at CS1.
23.06 hrs; completed station work
proceeded to station 2.

Tuesday 12 January 18.23 hrs; arrived CS2 and commenced programme.

Wednesday 13 January 01.48 hrs; completed station work
proceeded to Station 4.
22.22 hrs; arrived Station 4 and
started sampling programme.

Friday 15 January 00.01 hrs; Completed work on Station 4
proceeded towards Lands End.

Fri/Sat 15/16 January Hove-to sheltering in
St. Ives Bay.
17.00 hrs; Set course for Station 2a,
arrived station 2a and
commenced sampling programme

Sunday 17 January 02.00 hrs Completed programme set
course for shelter off Lundy.

Monday 18 January 11.00 hrs Docked Barry unloaded
equipment and proceeded
to Plymouth.

OBJECTIVES

To determine the presence or absence of a winter diapause condition in the copepod Calanus helgolandicus sampled from the shelf sea and ocean.

- a) To compare the vertical distribution and species composition of the overwintering plankton in the shallow shelf sea (100 m) with the plankton from the deep ocean (> 2000 m), with special reference to C. helgolandicus.
- b) To collect live material from a range of depths to determine whether or not the Calanus from the shelf sea are in a different physiological state from those in the deep ocean.

- c) To determine the levels of extra-cellular digestive enzymes in Calanus from both sites and determine the effects of starvation on the enzyme activity.
- d) To investigate the biotic conditions (chlorophyll, POC, phytoplankton etc.,) and hydrography at each of the station sites. Fig. 1.

PROCEDURES AND METHODS

See Cruise Programme IMER/1/82

OPERATION AND EQUIPMENT FAILURES

Bad weather was responsible for the loss of a few days on the cruise but all scientific objectives were completed. Over half of the XBT records were lost through the effects of high winds on the BT wire and from poor wire delivery by the launcher; the wire was coming out of the launcher in 'clumps'. The net monitor used to open and close the RMT 1 net failed to operate properly leaving one command signal available which was used to close the net at depth. The objective therefore to obtain uncontaminated samples from pre-requisite depths was not achieved.

The IMER chlorophyll/depth/temperature system was deployed on 6 occasions but poor tape transport was responsible for loss of 3 records.

It should be noted that the ship's self-inflatable life-jackets, for working on the trawl deck, were not placed onboard prior to sailing.

The cod-end of the RMT 1 was lost on the last deployment of the system at station 4.

RESULTS

- 1) 6 oblique hauls were taken with the double LHPR system, 3 in shallow water (100 m) and 3 in deep water (> 800 m). (461 individual samples).
- 2) Water bottle samples from eight depths (0 to 100 m) were taken at stations 1 and 2 and from ten depths (0 to 400 m) at station 4 for measurements of chlorophyll, POC, total suspended matter, phytoplankton, salinity and temperature. The water was isothermal at 9°C at station 1 and 10.2°C at station 2 (0 to 100 m) and isohaline at 35.10‰. The surface temperature at station 4 was 12.0°C; from 150 m there was a gradual reduction in temperature to 11°C at 500 m. The salinity profile (0-400m) was isohaline at 35.52‰.
- 3) Continuous depth, temperature and chlorophyll profiles were taken at stations 1, 2 and 4.

- 4) 5 oblique hauls were taken with the RMT 1 and numerous $\frac{1}{2}$ m net shallow (0 - 10 m) hauls were taken at Stations 1 and 2 to provide live stage V copepodites, male and female Calanus helgolandicus for length/dry weight, C and N measurements and for preservation and freezing. The fixed Calanus specimens were stored for later examination to determine intra-cellular enzyme activity and the frozen samples for analysis of extra-cellular digestive enzymes (amylase and trypsin).
- 7) Oblique hauls were taken, at station 4 with the RMT 1 net, through various depth strata between the surface and 700 m to locate the depth of the Calanus helgolandicus. Only stage V copepodites were found in any numbers and these were distributed between 400 and 550 m. Specimens were fixed and frozen for subsequent analysis back at IMER.

PREPARED BY:

R. Williams

APPROVED BY:-

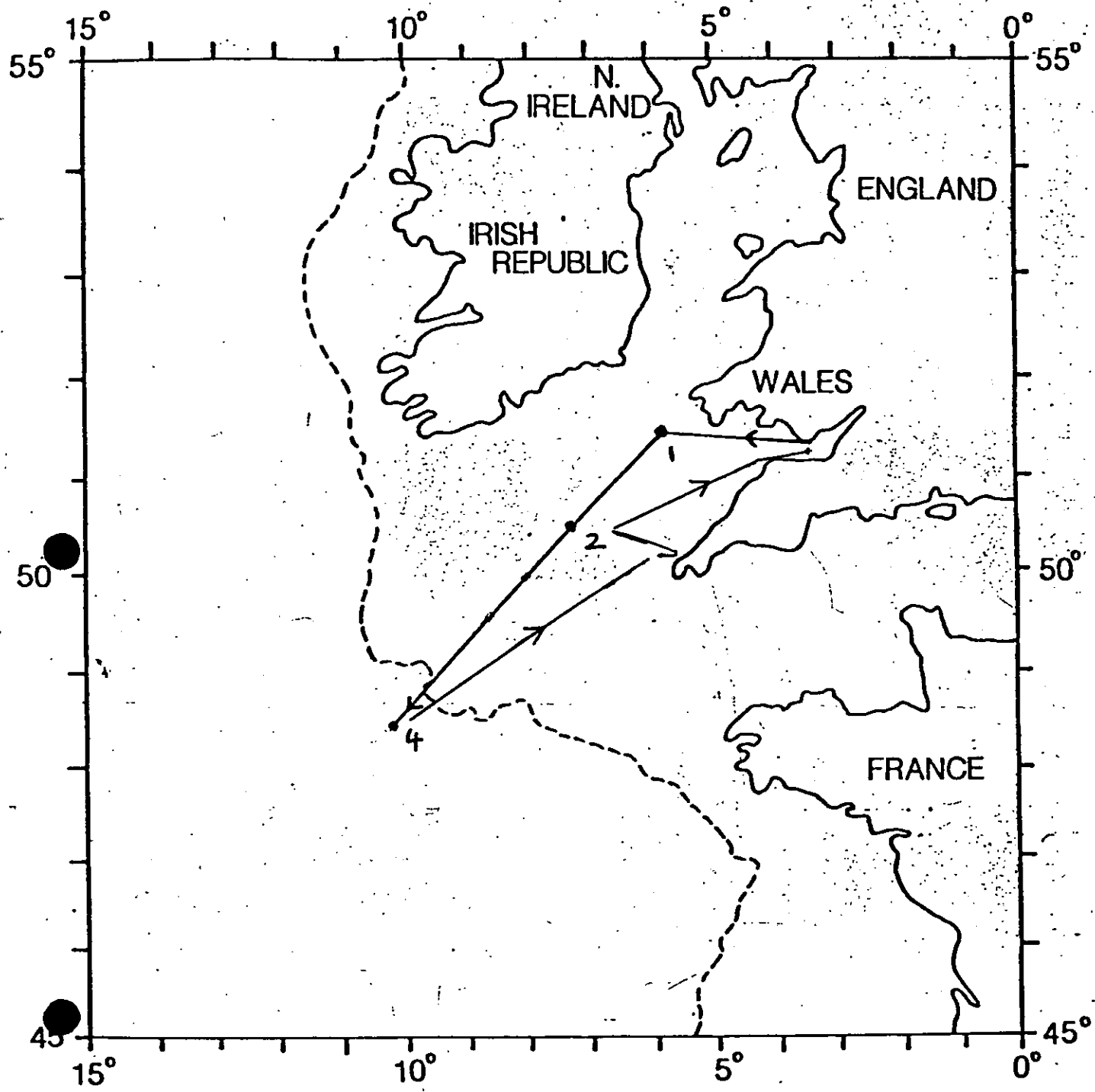
B. L. Bayne

DATE:

27.1.82

CIRCULATION LIST:

Internal Bayne, Robinson, Notice Board, File,
Williams, Collins, Conway.External NERC Foxton (Swindon)
RVS Skinner (Barry)
IOS Mrs Edwards (MIAS)
MBA Denton
DAFS Parrish
MAFF Harden-Jones



Stations 1 . 51° 30' N 05° 50' W
2 50° 30' N 07° 15' W
4 48° 20' N 10° 26' W