CRUISE REPORT 04/99

CONTENTS:

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R.V. Prince Madog:

S. Duckworth	Captain
A. Price	First Mate
A. Williams	Chief Engineer
H. Owen	Second Engineer
P. Jones	Bosun
T. Roberts	Able Seaman
P.D. Williams	Able Seaman/Steward

Time Breakdown:

Sailed from Menai Bridge	?09.00	19.04.99
Arrived at first station	17.04	19.04.99
Left last station	17.33	19.04.99
Left Fishguard	19.30	20.04.99
Arrived at Menai Bridge	?09.00	21.04.99

1. Abstract

The fourth in the series of cruises supporting the NERC funded 'Holocene palaeoceanography of shelf seas: long-term (10^3-10^4 years) seasonal stratification', the objectives of this cruise were to again sample at those sites in the Celtic Sea identified during the reconnaissance cruise, 7/98. The shipek grab-sampler and multicorer were deployed at one site, with sediment successfully retrieved. CTD data was also collected through the water column and bottom water samples obtained. The suitability of the sediments for multicoring was determined by examination of the contents of the shipek grab-sample. The longest multicore was subsampled for foraminifera. A second core was sampled for dinoflagellates, organic carbon and grain size at the surface. The top 0-0.5 cm was sampled in a third core where possible for benthic foraminifera.

2. Introduction

a. Scientific aims of project

This cruise was run as part of a NERC funded project entitled 'Holocene palaeoceanography of shelf seas: long-term (10^3 - 10^4 years) seasonal stratification dynamics. The aim of this project is to generate a record of environmental change relating to development of seasonally stratified water in the Celtic Sea during the Holocene.

b. Specific cruise objectives

The aim of this cruise was to collect a further, 'pre/during-bloom', set of multicores from the sites already identified during cruise 7/98. These sites are to be examined for changes in the seasonal vertical distribution of benthic foraminifera and for seasonal variability in the environmental conditions at each site. Additional aims were to collect samples from the seabed at these sites for dinoflagellate, grain size and organic carbon samples.

c. Narrative of cruise

The R.V. Prince Madog sailed from Menai Bridge at ~09.00 on 19.04.99 in calm conditions. The first site, site 9, was reached at 17.04 (19.04.99) and the grab sampler was the first instrument deployed and the sample returned confirming the suitability of sediment at this site for coring. One sediment sample was taken from the grab sampler and stored. Multicorer was deployed four times, retrieving three cores overall. The CTD successfully collected temperature, salinity and oxygen data from throughout the watercolumn. The attached rosette water sampler fired successfully and a bottom water sample taken (Bottle No. 1).

Bad weather and forecast of a deepening low pressure and high winds resulted in the ship seeking shelter in Fishguard harbour. It was decided to return to Menai Bridge and the ship left Fishguard on 20.04.99 at 19.30 hours. No other stations were sampled during the cruise.

The ship arrived back at Menai Bridge at ~09.00 on the 21.07.99.

3. CTD Operations

The CTD, a Neil Brown system, was used to collect data on salinity, temperature and pressure. All the sensors appeared to work well. A total of 1 CTD casts was made.

The CTD system was fitted with a rosette water sampling system and this was triggered to collect at the deepest point of the drop, usually 10 m from the sea bed. The water collected was used for calibration of the CTD and for oxygen isotope and oxygen concentration measurements. The calibration bottle for the CTD were rinsed out in the collected water and then filled to the neck. The bottle for oxygen isotope measurements were filled using a piece of tubing inserted into the bottle right to the bottom. The bottle was allowed to fill from the bottom, while swirling the tube around to remove as many air bubbles as possible. The bottle was allowed to overfill until three times its capacity of water has passed through it then the tubing was slowly lifted out and the cap screwed on. This was carried out at site 9 and the bottle was stored in the fridge. The oxygen concentration bottle was filled in the way described for oxygen isotopes. To fix the samples in preparation for, Winkler titration, to be carried out on land, a 1 cm^3 volume of both manganese sulphate and alkaline sodium iodide was delivered by pipette to the sample.

4. Sediment collection

A shipek grab was carried on board to collect surface samples. These samples were stored for dinoflagellate analysis. They were also examined visually for grain size to determine whether the site was sufficiently fine grained to deploy the multicorer.

The multicorer system consists of four core tubes, core catchers and a hydraulic coring system mounted in a bell-shaped frame. After attaching the cores, catchers and additional weights and priming the system on deck, the core was winched overboard and dropped to the seabed where the cores slowly enter the sediment taking a relatively undisturbed core with a good sediment-water contact. Once the corer was back on deck the core catchers were removed and the cores bunged. The cores were taken out of their holds and placed in a cradle to await further sampling.

Of the returned cores the longest was sectioned at 1 cm intervals to the end of the core. Each circular section, as it was extracted, was stored in a 250 ml sampling bottle with an equal quantity of ethanol and approximately 10 - 20 ml of rose Bengal solution.

A second core from each site was sampled at the 0-0.5 cm interval. Half of the circular section was stored for dinoflagellate analysis, and one quarter for grainsize and the other quarter for organic analyses. The latter sample was frozen.

5. Equipment problems

No equipment problems were encountered during the cruise.

6. Station log

Station no.	Sampling	Date	Time	Latitude	Longitude	Depth	Comment
Site 9	Grab	19.04.99	17.04	52 44.93	04 27.98	29	
	MultiC		17.07	52 44.95	04 28.00	29	No cores retrieved
	MultiC		17.11	52 44.98	04 28.09	29	1 core
	MultiC		17.17	52 45.00	04 28.10	29	No cores retrieved
	MultiC		17.21	52 45.01	04 28.20	18	No cores retrieved
	MultiC		17.30	52 44.95	04 28.06	30	2 cores
	CTD		17.33	52 44.97	04 28.11	30	