

RRS Frederick Russell Cruise 10/84, (2nd Leg - 10-19 June, 1984

Scientific Report

- 1. Personnel:

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2. Itinerary:

The ship departed from Plymouth at 0000h, 11 June, and returned to Falmouth at 1930h, 19 June. The cruise track and station positions are shown in Fig. 1.

3. Scientific programme:

Details of the hydrographic stations are given in Table 1. Throughout the cruise, surface (3.5m) water temperature, salinity, chlorophyll fluorescence (Turner Design and Chelsea fluorometers), light transmission (Chelsea 660nm, Sea Tech 420nm), turbidity, nitrate, nitrite and silicate, as well as solar irradiance and water depth, were measured continuously. Water samples were taken for determination of salinity, chlorophyll a, and particulate carbon, nitrogen and calcium. On the CTD stations the rosette sampler was used for profiles of chlorophyll and nutrients. For some shallow profiles, the Chelsea transmissometer was attached to the CTD. Two XBT sections were made across the shelf break. An acoustic record for the 0-200m layer was obtained from the bridge echo sounder.

Analyses of SF₆ and the fluorocarbons, F-11 and F-12, by gas chromatography were successfully completed for water samples taken down to 1500m at the five deep water stations.

Measurements of volatile organic sulphur compounds were made across the tidal and shelf break frontal systems, and on vertical profiles through chlorophyll-rich layers. These will enable levels of dimethyl sulphide to be related to the biomass and species composition of the phytoplankton.

Eight primary production experiments were completed, and included both long and short term incubations with ¹⁴C and ⁴⁵Ca. Unfortunately no blooms of the coccolithophore, Emiliana huxleyi, were encountered on the outer shelf.

Measurements of upwelling and downwelling irradiance were made at 20 stations, using the 6-channel radiometer developed at Menai Bridge. Supporting information on chlorophyll, particulate carbon and total seston at one or two depths was obtained. Related remote sensing data sets include a CZCS image of the western English Channel on 17 June, a flight of the Daedalus scanner for Prof. Cracknell (Dundee University) on the NERC aircraft across stations 29-32 on 19 June, and several NOAA Channel 1 images showing a persistent anomalous feature in the western English Channel.

Seven good gravity cores of slope sediments at 500-2470 m were obtained. Only one attempt to core was unsuccessful due to compact sand at the shelf edge (245 m).

Other work included one Agassiz net haul, the collection of surface film samples at Station 20, and the collection of cyanobacteria isolates from various depths at station 20.

4. General Conclusions:

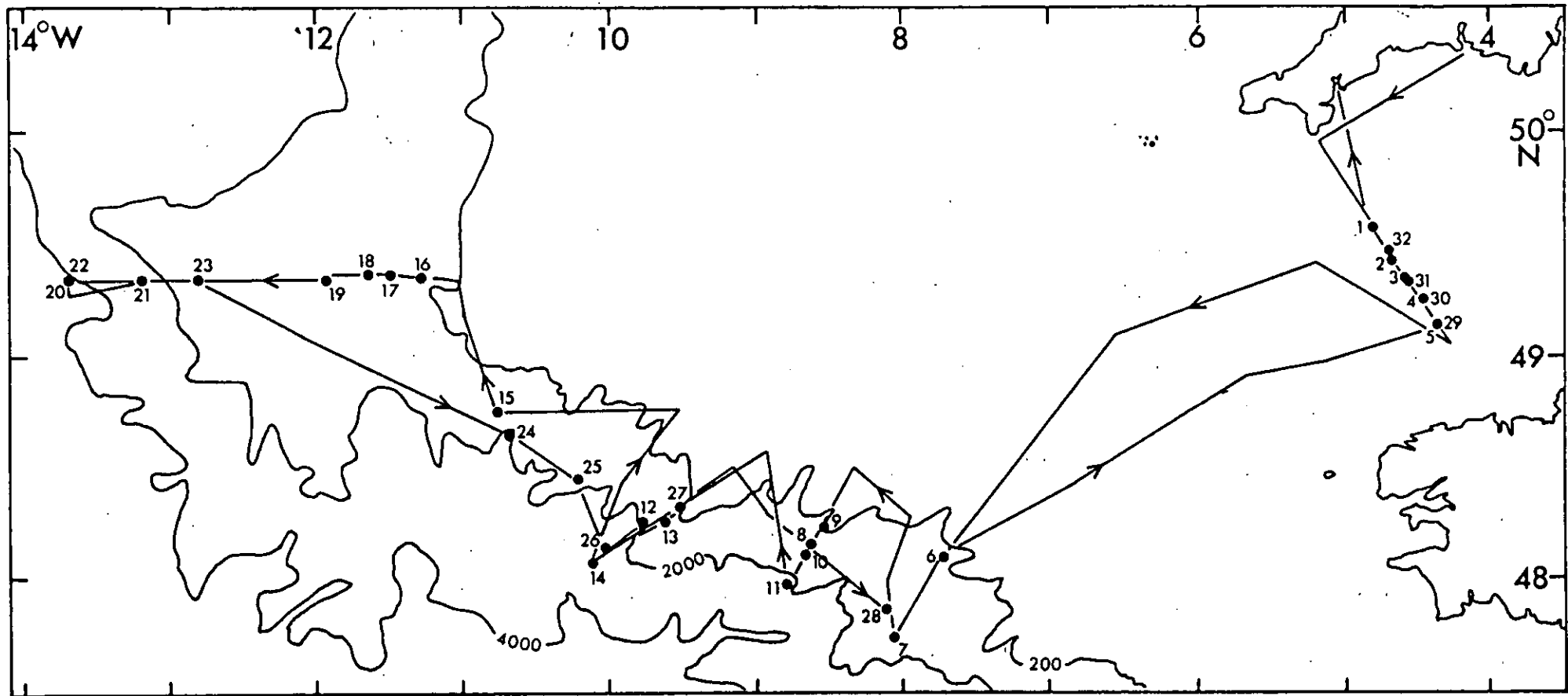
The scientific objectives of the cruise were fully met, with no major problems concerning either ship operation or the functioning of the scientific equipment. The weather was excellent throughout the cruise, so that some uncertainties remain about the working of some scientific apparatus, in particular the gas chromatographs, under more normal conditions. For the 1985 programme the only major development necessary is the interfacing of the CTD with the Chelsea fluorometer-transmissometer.

STATION DETAILS

No	Date	Time (BST)	Position		Water depth (m)	Observations
			N	W		
1	11/6	0745-0918	49°32'	04°48'	81	R(10)
2		1010-1113	49 24	04 42	81	R(6)
3		1155-1400	49 21	04 34	85	C(80), R(6), P
4		1515-1646	49 15	04 26	85	C(80), R(9.5)
5		1745-1952	49 08	04 21	90	C(80), R(22)
6	12/6	1330-1715	49 04	07 45	195	C(180), C/T(105), R(12), P
7		1951-0133	47 42	08 03	1200	C(1000), C/T(100), G(133)
8	13/6	1104-1210	48 08	08 38	315	R(11), P
9		1253-1508	48 13	08 34	180	C(200), C/T(100), R(10)
10		1624-1727	48 06	08 40	600	C(500), C/T(100)
11		1825-0112	47 58	08 48	2300	C(2000), C/T(100), R(13), DWS
12	14/6	0950-1105	48 14	09 46	(1500)	R(7.5), P
13		1806-1950	48 14	09 42	500	R(7.5)
14		2130-0034	48 03	10 08	3600	C(2000), DWS
15	15/6	0940-1106	48 45	10 45	(1500)	R(6.5), P
16	15	1613-1831	49 21	11 17	245	C/T(200), R(?)
17	15	2000-2118	49 22	11 29	510	C/T(500), G(90)
18	15	2200-0015	49 22	11 39	845	C/T(500), G(134)
19	16/6	0120-0255	49 20	11 56	1090	C/T(500), G(131)
20	17	0900-2030	49 20	13 41	4250	C(2000), C/T(500), R(?), DWS, P
21		2223-0054	49 20	13 11	2470	C/T(500), G(226)
22	17/6	0250-0452	49 20	13 40	4200	DWS
23		0753-1135	49 21	12 49	1500	C/T(500), R(9), P, G(120)
24		2000-2020	48 39	10 40	(2500)	C(100)
25		2240-2328	48 26	10 12	1270	G(146)
26	18/6	0117-0600	48 07	10 01	(3500)	C(2100), DWS
27		0903-0920	48 20	09 29	380	C(100), P
28		1555-1706	47 51	08 06	1500	R(9)
29	19/6	0930-1018	49 08	04 21	88	C(80), R(10-14)
30		1110-1147	49 15	04 24	85	C(80), R(?)
31		1223-1313	49 20	04 35	85	C(85), R(11-12)
32		1418-1500	49 28	04 44	81	C(80), R(12)

Key to observations:

- C - CTD profile (depth, m)
- C/T - CTD-transmissometer profile (depth, m)
- R - Radiometer measurements (Secchi depth, m)
- G - Gravity core (core length, cm)
- DWS - Deep water sampling for SF₆ and fluorocarbons
- P - Primary production measurements



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