

CEFAS, PAKEFELD ROAD, LOWESTOFT, SUFFOLK, ENGLAND

1998 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 9a

STAFF:	Dr J Brown	Mr L Fernand
	Miss J Taylor	Mr B Riches
	Mr K Medler	Miss L Carrillo (UWB)
	Dr E Young	Mr K Horsburgh (UWB)
	Ms A Joyce (Part 1)	Dr C Whalley (Part 1)
	Dr D Mills (Part 1)	Mr G Nolan (NUIG) (Parts 2 & 3)

UWB - University of Wales, Bangor

UCG - National University of Ireland, Galway - Irish Observer

DURATION: 20 August - 6 September

LOCALITY: Part 1 - Thames mooring (20 - 22 August) (Figure 1).
 Part 2 - North East coast (22 - 24 August) (Figure 1).
 Part 3 - St. George's Channel and Celtic Sea (25 August - 6 September) (Figure 2).

AIMS:

Part 1 was to recover a Smart Biophysical Mooring previously deployed in the Thames as part the Climatic Status of UK Coastal waters programme.

Part 2 was directed at a better understanding of the dynamics of the circulation processes fringing the north east coast of England, between the Firth of Forth and Flamborough Head, and in vicinity of the Dogger Bank. It is intended to characterise the extent and nature of the density driven and seasonal jet like circulation which acts as a direct and rapid pathway for transport of material from the coastal region to the central North Sea. Subsequently, the knowledge will be viewed with respect to concerns that elevated levels of contaminants on the Dogger Bank have originated in the near coastal region.

Part 3 was directed at a better understanding of the dynamics of the circulation processes in the Celtic Sea/St. George's Channel region. As on the North-east coast, it is intended to characterise the extent and nature of the seasonal density driven circulation.

The main sampling aims of the cruise are:

1. To undertake CTD and grab surveys of the North East coast to collect information on nutrients, suspended sediment and metals.
2. To recover two moorings in the vicinity of the Thames.
3. To recover three mooring arrays in the Celtic Sea/St. George's Channel.

4. To recover free floating satellite tracked buoys in the Celtic Sea/St. George's Channel.
5. To undertake physical and chemical surveys of the Celtic Sea region.

NARRATIVE (all times GMT):

CORYSTES eventually sailed at 0800 20 August, 24 hours late owing to staffing problems. As poor weather was forecast for the North East coast, the ship made for the Thames (Fig. 1) and the recovery of a smart biophysical mooring (SBM) system. On arrival, a CTD was undertaken for mooring calibration purposes and the SBM mooring recovered. The ship then anchored for the change of tide in order to recover the adjacent 'U'-shaped current meter mooring. Unfortunately, at the beginning of recovery the line leading to the ground anchor became entangled with the ship's propeller. There was little option but to anchor and await an easing of the weather so that divers could disentangle the mooring. This was accomplished 24 hours later (21 August) and subsequently the mooring recovered intact. CORYSTES sailed for the vicinity of Flamborough Head, stopping en-route to put a by now desperate Dr Mills ashore by searider at Lowestoft during the early hours of 22 August.

A line of NIOZ coring stations (Fig. 1) were occupied northward from Flamborough Head followed by a line of CTD's onto the Dogger Bank from the north-west (Fig. 1). It was intended that the CTD stations be repeated with the NIOZ corer. However, following the third station the frame of the corer became twisted. At this point the weather had begun to deteriorate, and in the knowledge that the NIOZ corer was required on Part b of CORYSTES 9, the ship returned to Lowestoft, docking mid-day 24 August. Here, further staffing problems were resolved, some gear put ashore and Dr Whalley and Ms Joyce exchanged for Mr Nolan. Corystes sailed for the Celtic Sea on the evening tide.

Work commenced in the Celtic Sea (26 August) with the recovery of two Argos buoy west of the Scilly Isles (Fig. 2). For the next five days a series of Scanfish sections were occupied, traversing the Celtic Sea between Ireland and England in perfect weather conditions. During this period two Argos buoys, grounded west of Carnsore Point were recovered. In addition, the acoustic Doppler current profiler (ADCP) south of Ireland and the conventional mooring in the Bristol Channel, both deployed on Corystes 7/98, were retrieved. Unfortunately, the surface toroid marking the ADCP site was absent, however, the acoustic release governing the discharge of the recovery line worked first time.

Overnight of 30 - 31 August the weather deteriorated, although Scanfish operations were still possible. This was followed by the recovery of two Argos buoys in the Celtic Deep. With the wind rapidly dying away a CTD line was occupied into the Devon coast and a Scanfish section undertaken on a reciprocal course (1 September).

Following a Scanfish line north-eastward through St. George's Channel (1 - 2 September), 5 Argos buoys and a bottom mounted ADCP were recovered. The latter was particularly satisfying as the marker toroid had been put ashore in Cherbourg by a French trawler some weeks previous. Again the acoustic release system worked first time, although the drag on the recovery rope from the strong tide initially dragged the

released floats below the surface. Whilst waiting for the tide to slacken, a Sun Fish was observed.

During 2 - 4 September series of Scanfish legs were undertaken in St. George's Channel. Additionally, the opportunity was taken to put Mr Horsburgh ashore in Fishguard and to test the outboard of the Searider which had been troublesome earlier in the cruise. The final drifter was recovered on the evening of 4 September followed by a CTD line overnight across St. George's Channel. Finally, two Scanfish lines were undertaken in the Bristol Channel before CORYSTES docked in Swansea at 0500 6 September.

RESULTS (Preliminary):

- 1) The survey was a continuation of work reported under CORYSTES 7/98. Unfortunately, the 24 hours delay in sailing and the problems of the Thames severely curtailed the intended programme of work in this region. A single CTD section (Fig. 1) was completed, sampling for trace metals, organics, suspended load and chlorophyll. Contrary to last year, the water column on the Dogger Bank in less than 35 m was fully mixed. Full data analysis awaits return to the laboratory.
- 2) The moorings were recovered from the Thames. Encouragingly, the WS Aqua monitor (water sampler) and NAS-2 nutrient analyser had both worked for the duration of the deployment. However, the volume of water samples decreased with time throughout the deployment and there was evidence for fouling of the inlet tubes. In addition, the surface light and conductivity cells were badly fouled with growth. Also, the nitrate levels in the sample bags appeared anomalously low.
- 3) Despite the loss of the marker toroids from the ADCP sites, both instruments were recovered. The laying of the marker toroid alongside the ADCP, but not attached by ground wire appears to have ensured the recovery of the instruments, or at the very least the acquisition of full records. Initial inspection of all instrument records indicates that the data is of excellent quality.
- 4) The free drifting satellite tracked drifters were recovered, their overall pattern of movement describing an essentially anti-clockwise circulation about the Celtic Sea. Flows were particularly strong in the vicinity of St. George's Channel, where drifters traveled northwards on the east side of the channel before returning into the Celtic Sea or along the Irish coast. Only one instrument failed to take this pathway, remaining in the south of Cardigan Bay.
- 5) The series of Scanfish legs (Fig. 2) covering a distance of 1330 nautical miles (~2500 km) showed the majority of the region to be stratified, with a significant contribution from the freshwater at the mouth of the Bristol Channel and north into St. George's Channel. A tongue of cool high salinity Atlantic water extended north through the Celtic Deep and into St. George's Channel and was fringed by strong bottom fronts. Parallel with the coasts of Devon and Ireland were a series of comparatively weak bottom fronts. The majority of the data awaits further analysis and interpretation on return to the laboratory.

Staffing problems and operational difficulties (2.5 days) during parts 1 and 2 of the cruise, combined with weather downtime at the end (1.5 days), resulted in the loss of

approximately 20% of the scheduled cruise time. This had a detrimental effect in terms of meeting the cruise aims. Whilst it is inevitable that weather and operational difficulties occur at sea, the staffing problems were unfortunate. Nevertheless, parts 2 and 3 were largely successful, aided by the hard work, enthusiasm and good humor of the ships officers and crew.

6 September 1998
Dr Juan Brown
(Scientist-in-Charge)

SEEN IN DRAFT:

R Williams (Master)
R Graham (Senior Fishing Skipper)

DISTRIBUTION:

BASIC LIST+

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Mr K Medler	Dr D Mills
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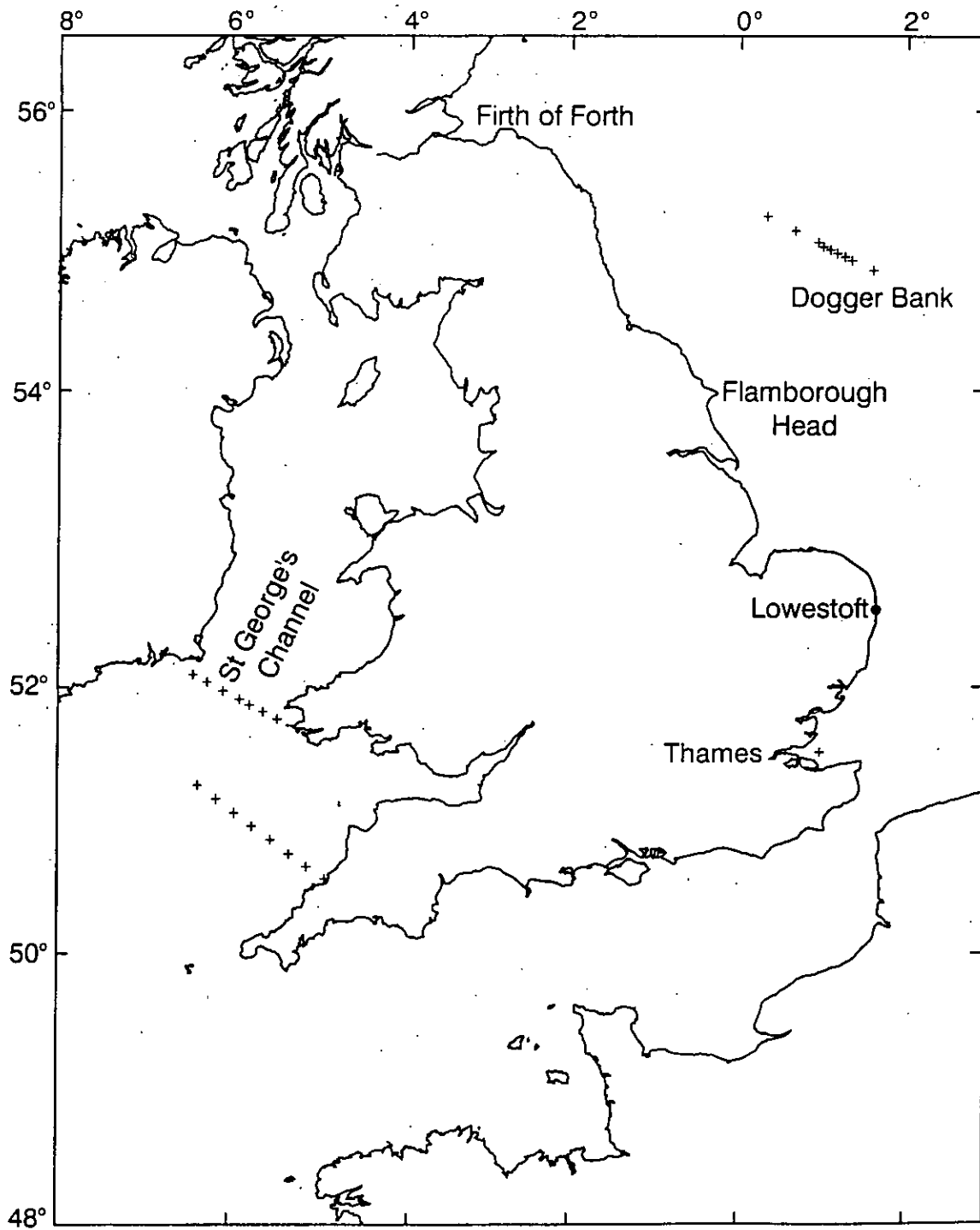


Figure 1. Locations of CTD stations, Corystes 9a/98

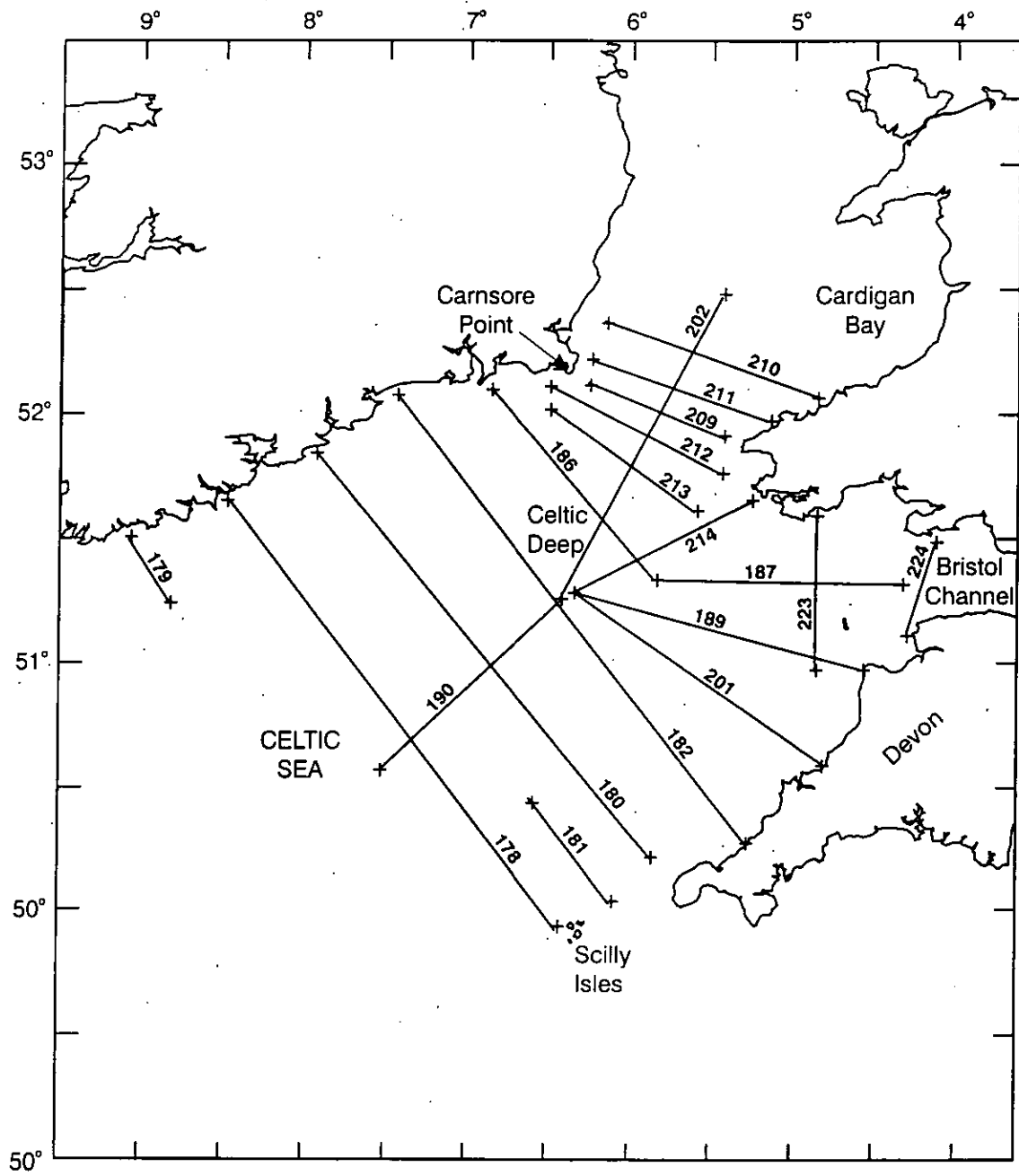


Figure 2. Scanfish sections, Corystes 9a/98