

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD  
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1995 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 10

STAFF:

Dr J Brown	Mr K Medler
Mrs A Reeve	Mr J Read
Mr S Jones (26 Sep- 17 Oct)	
Mr L Fernand (25-26 Sep & 1- 17 Oct)	
Mr I Herdman (GMI) (25-26 Sep)	
Mr E Olsen (GMI) (25-26 Sep)	
Ms J Taylor (26 Sep-17 Oct)	
Mr B Fogg (25 Sep-9 Oct)	

GMI - Geological and Marine Instrumentation, Denmark.

DURATION:

25 September - 17 October

LOCALITY:

Irish Sea, North Channel, Malin Shelf and North Sea (Figs. 1 and 2).

AIMS:

The work is directed at a better understanding of the dynamics of the North Channel which control the flushing characteristics of the Irish Sea. Net outflow from the Irish Sea is northward, but there are apparently long periods of inflow on the western side of the channel. It is not known to what extent outflowing water recirculates and extends southward along the Irish coast or what importance inflows of Atlantic water have on flushing characteristics of the region. Variability in the flow regime and factors governing it are poorly understood. The main sampling aims of the cruise were:

1. To deploy and recover mooring arrays in the North Channel and western Irish Sea.
2. Deploy and retrieve free floating ARGOS buoys in the North Channel and western Irish Sea to determine the Lagrangian circulation.
3. Undertake associated physical and biological surveys of the region in support of 1) and 2).
4. Continue inter-comparisons of the Valeport BFM308 and Aanderaa RCM-7 current meters.
5. Undertake SCANFISH trials.
6. Measure near bed velocities in the vicinity of a munitions dumping site in the North Channel.
7. If possible, recover the Minipod at the sand extraction site Area 107 in the outer Wash. Failing this, service the guard buoy marking the position of the Minipod.
8. Test for acoustic interference with the Tritech altimeter on the CTD rosette.

## NARRATIVE (all times GMT):

RV *Corystes* sailed at 21:30 (25 September) for the outer Wash (Fig. 1) and a Minipod at the sand extraction site known as Area 107. The instrument had been left following an abortive attempt at recovery the previous week (Cirolana 8). Again recovery was not possible, but the battery box on the guard buoy marking the position was replaced, with the intention to recover on *Corystes* 11b.

Following this, the SCANFISH was to be trialed in the Outer Silver Pit. Unfortunately, poor weather necessitated a switch to the more sheltered, but geographically smaller, Silver Pit. Initially the trial proceeded well, until a deliberate attempt to cut the SCANFISH cable by the fishing vessel *Diana*. Prior to this, radio contact had established that the Silver Pit was surrounded by crab pots (the markers for which were submerged), but the deep areas in which the *Corystes* was working was free of obstruction. Shortly after, the vessel towed across our stern, grappling the SCANFISH cable and damaging the SCANFISH towing point and part of the body. It was extremely fortunate that the instrument was not lost and that injury to personnel was avoided. Further work was impossible and *Corystes* returned to Lowestoft for 21:30, where the SCANFISH was unloaded for repair the following morning. Mr Fernand, Mr Olsen and Mr Herdman disembarked in order to complete what tests they could on the SCANFISH in the laboratory. *Corystes* sailed for the Irish Sea (09:30 27 September) with Mr Jones and Ms Taylor.

Following a good passage, two moorings were deployed (29 September), one in the north western Irish Sea (I; Fig. 3) and the other at a munitions disposal site in the North Channel (P; Fig. 3). Subsequently, four ARGOS buoys were placed in the North Channel (Fig. 4a). At first light (30 September) two current meters were recovered from the DANI mooring (Station 38) in the western Irish Sea, followed by the deployment of 5 ARGOS buoys (Fig. 4b). Throughout the day the weather deteriorated, work ceasing after a test of the Tritech altimeters on the CTD rosette in the lee of the western side of the Isle of Man. As the wind was moving into the south west we proceeded to 'dodge' off Douglas before docking 13:00 1 October in order to collect Mr Fernand and the repaired SCANFISH.

With poor weather, *Corystes* remained in Douglas for 2 days until the prospect of a brief period of easterly winds forced us to depart our berth (17:30 3 October). With the winds backing later to the south west we made for the shelter of the Irish coast near Dublin. By 06:00 5 October a short lull permitted a SCANFISH section across the Irish Sea (Fig. 5), finishing off Anglesey to shelter from the gale force winds associated with the next depression.

By 23:00 5 October the winds had abated sufficiently to allow a passage to the Clyde in order to pick up an ARGOS buoy which had apparently foundered on Arran (Fig. 4a). The buoy, minus drogue, was quickly retrieved by *Searider* and with excellent conditions a further buoy was retrieved north of the Mull of Kintyre (Fig. 4a). An attempt was then made to collect a buoy where the drogue appeared to be periodically catching in shallow water off the south west peninsula of Islay (Fig. 4a). Although the instrument could be detected on the VHF tracking gear, the search had to be abandoned (17:00 6 October) in order to seek shelter off the Northern Irish coast from yet another gale.

By late evening (23:00) 8 October winds had eased sufficiently to allow passage to the Clyde, where we dodged until 14:00 (9 October) when Mr Fogg was put ashore in Arran. The

following morning, the SCANFISH grid was resumed in the Irish Sea (Fig. 5; lines 21 - 28) at 06:30 10 October. Work continued until 07:00 11 October, north east of the Isle of Man. Following this, two Argos buoys were recovered and two SCANFISH lines (31 and 32) completed east of Dublin. A further ARGOS buoy was retrieved and 5 CTD's undertaken on 12 October (Fig. 3). Friday 13 October delivered good conditions, enabling the recovery of two ARGOS buoys and the two current meter moorings. Finally, the ARGOS buoy aground of Islay was recovered (07:00 14 October) before passage to Lowestoft.

#### RESULTS (Preliminary):

The apparently unending series of gales, coupled with the *Diana* incident, seriously reduced the planned work programme (60% of work period lost).

1. Two moorings (I and P; Fig. 3) were successfully deployed and recovered and current meters retrieved from the DANI mooring at Station 38 in the western Irish Sea (Fig. 3). The data will provide validation for the North Channel model and aid in the detiding of ADCP data.
2. Nine ARGOS buoys were deployed in the western Irish Sea and North Channel (Fig. 4a and 4b) and eight subsequently recovered. One buoy received a knock during deployment and failed to transmit a position. Those buoys in the North Channel and to the east of the western Irish Sea appeared to be largely driven by the succession of strong southerly winds. Those on the west showed a southward flow, although weaker than that observed in summer (see Corystes 7/94 and 5b/95).
3. This aim represented the bulk of the planned work and was that most seriously affected. Despite this, a reasonable survey of the western Irish Sea was carried out with SCANFISH. Although the majority of the water column was well mixed there was some residual stratification in the deep central trough (Fig. 6). Even this level of stratification appears sufficient to drive a cyclonic circulation as demonstrated by the ARGOS buoys, with geostrophic velocity (density forcing) estimates of the order  $5 \text{ cm s}^{-1}$ . Unfortunately, little work was possible in the North Channel proper.
4. Data from the Valeport BFM308 and Aanderaa RCM-7 deployed for comparison on mooring I increased confidence that deficiencies in the Valeport compass have been overcome.
5. Modifications had been made to the SCANFISH following failures of hardware on Corystes 5b/95 and erratic performance on Cirolana 5/95. Unfortunately, the incident with the fishing vessel *Diana* brought an abrupt halt to trials. Despite this, the GMI personnel were able to collect sufficient information to indicate that performance was improved. A positive aspect was that after repair, trials in the tank at DFR highlighted a defect in the altimeter, designed to turn the SCANFISH above the sea bed, which was rectified before loading at Douglas. During operation, the altimeter apparently performed reliably near the bed, but registered false echoes near the surface which on occasion made diving difficult. It is felt that most sensible mode of operation is to turn the SCANFISH above the sea bed by manual instruction via the key board and use the altimeter as the backup. Rather disappointingly, since return of the Fluorometer to the manufacturer to cure an over ranging problem on the backscatter sensor the

fluorescence channel appears inoperative. More seriously, upon recovery after the first leg, of the four bolts securing the towing bridle to the SCANFISH one was missing and two were loose. The fault was rectified on board ship by drilling the heads of the securing bolts and wiring them together. Loctite was also applied to the bolts.

6. Mooring P (Fig. 3) was situated on the nominal position of a munitions dumping site. On recovery the mooring was approximately 1.5 miles out of position, presumably as a result of trawling activity. Despite this, the record appears good and will deliver a measure of the near bed velocities in the region.
7. It was not possible to recover the Minipod at Area 107. Interrogation of the acoustic release on the instrument indicated that it was not upright and attempts to release the recovery line were unsuccessful. The battery box on the guard buoy was serviced.
8. New Tritech altimeters purchased for the CTD rosette have performed poorly. A series of tests has pointed to acoustic interference from all ship mounted echo sounders and the ADCP. Such problems were never experienced with the old style Mesotech instrument.

Despite considerable down time, useful work was possible. This was due in no small part to the expertise and enthusiasm of the ships crew and officers, as well as the scientific staff.

Juan Brown  
(Scientist-in-Charge)  
14 October 1995

SEEN IN DRAFT:

M.J. Willcock (Master)  
R.F. Graham (Senior Fishing Mate)

INITIALLED: JEP

DISTRIBUTION:

BASIC LIST+

Dr J Brown x 10

Mrs A Reeve

Mr J Read

Mr S Jones

Mr L Fernand

Mr B Fogg (RVSU)

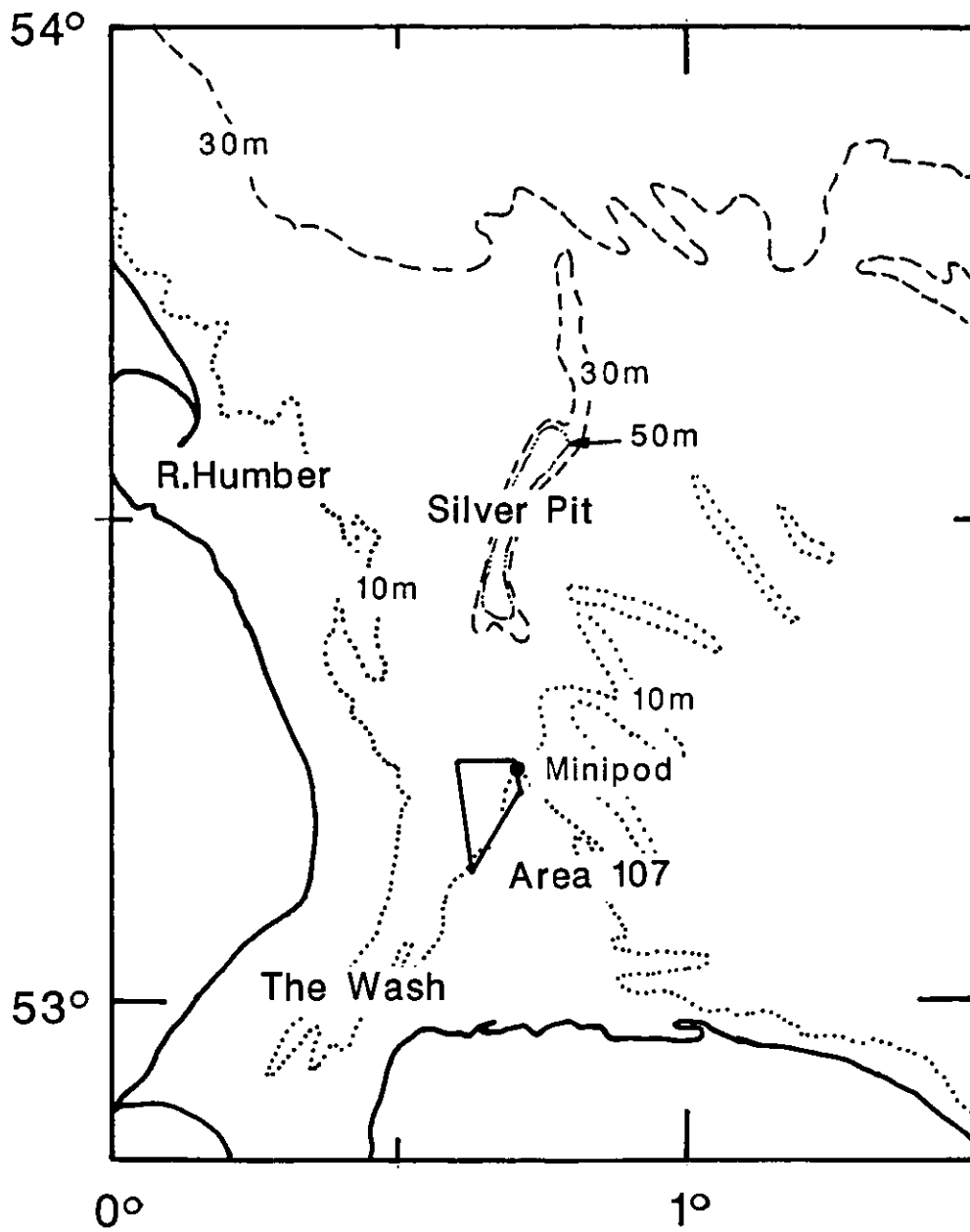
Ms J Taylor

Mr K Medler

Fig. 1

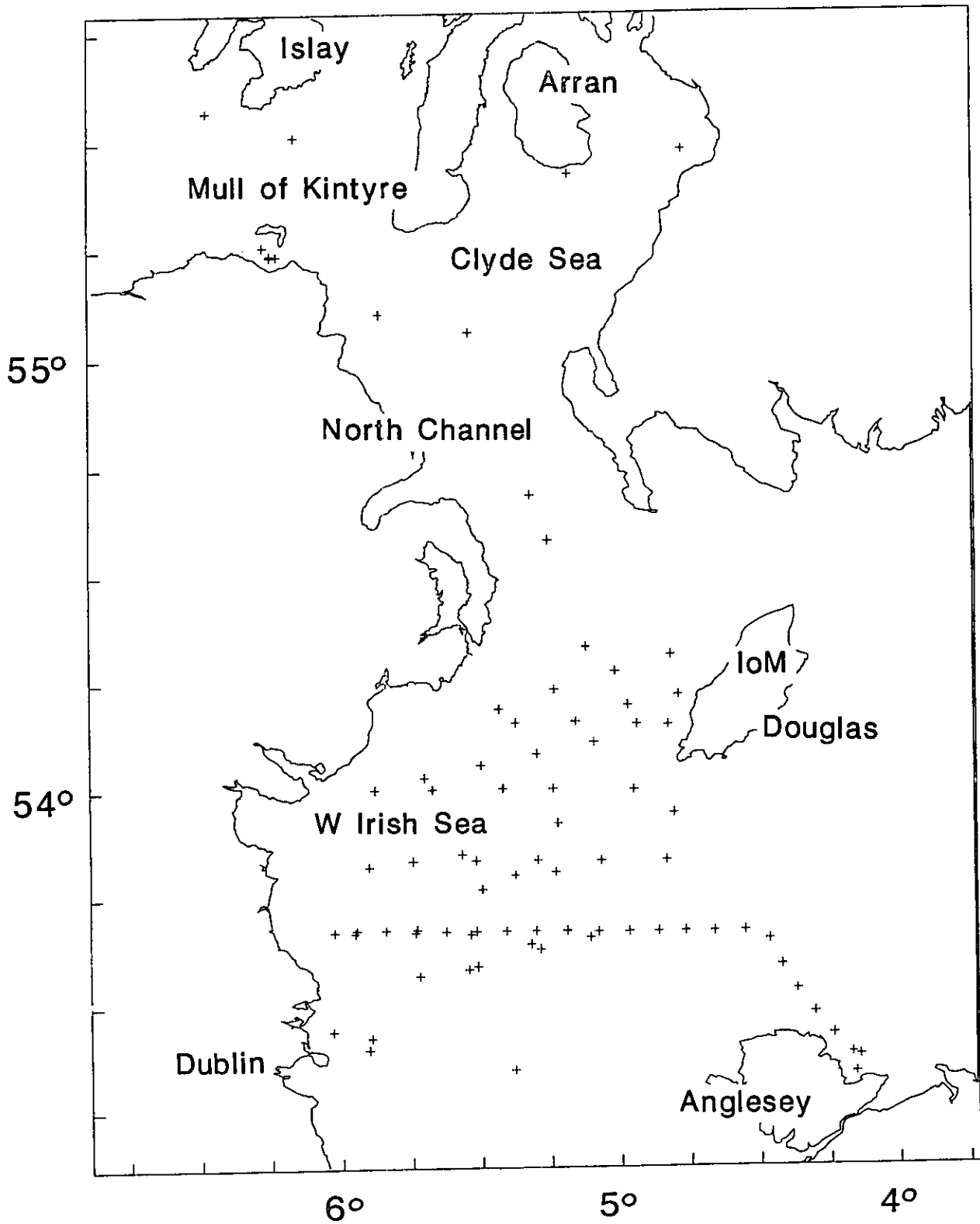
Corystes 10/95

North Sea working area



Corystes 10/95

Irish Sea working area



Corystes 10/95

Current meter and CTD stations

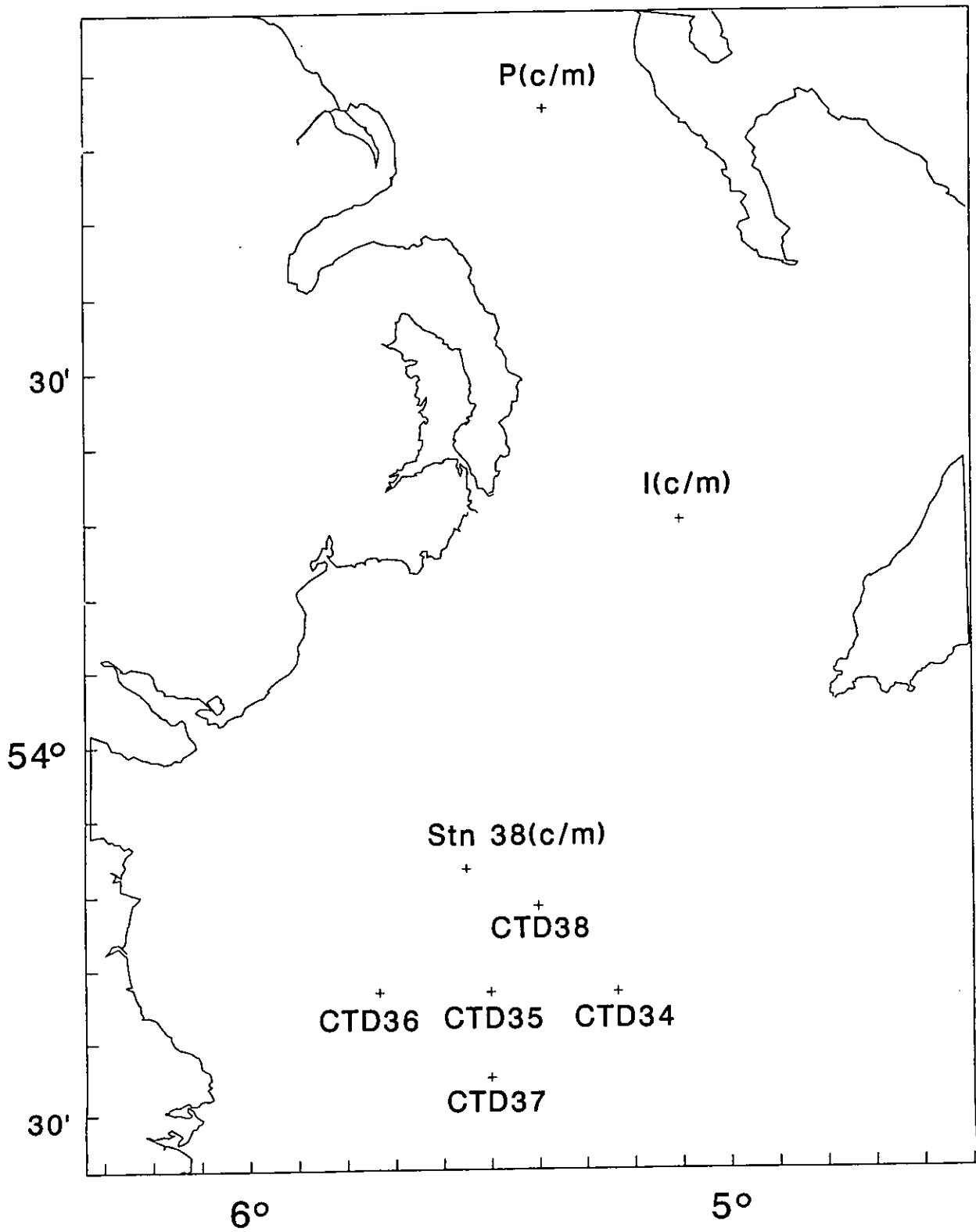
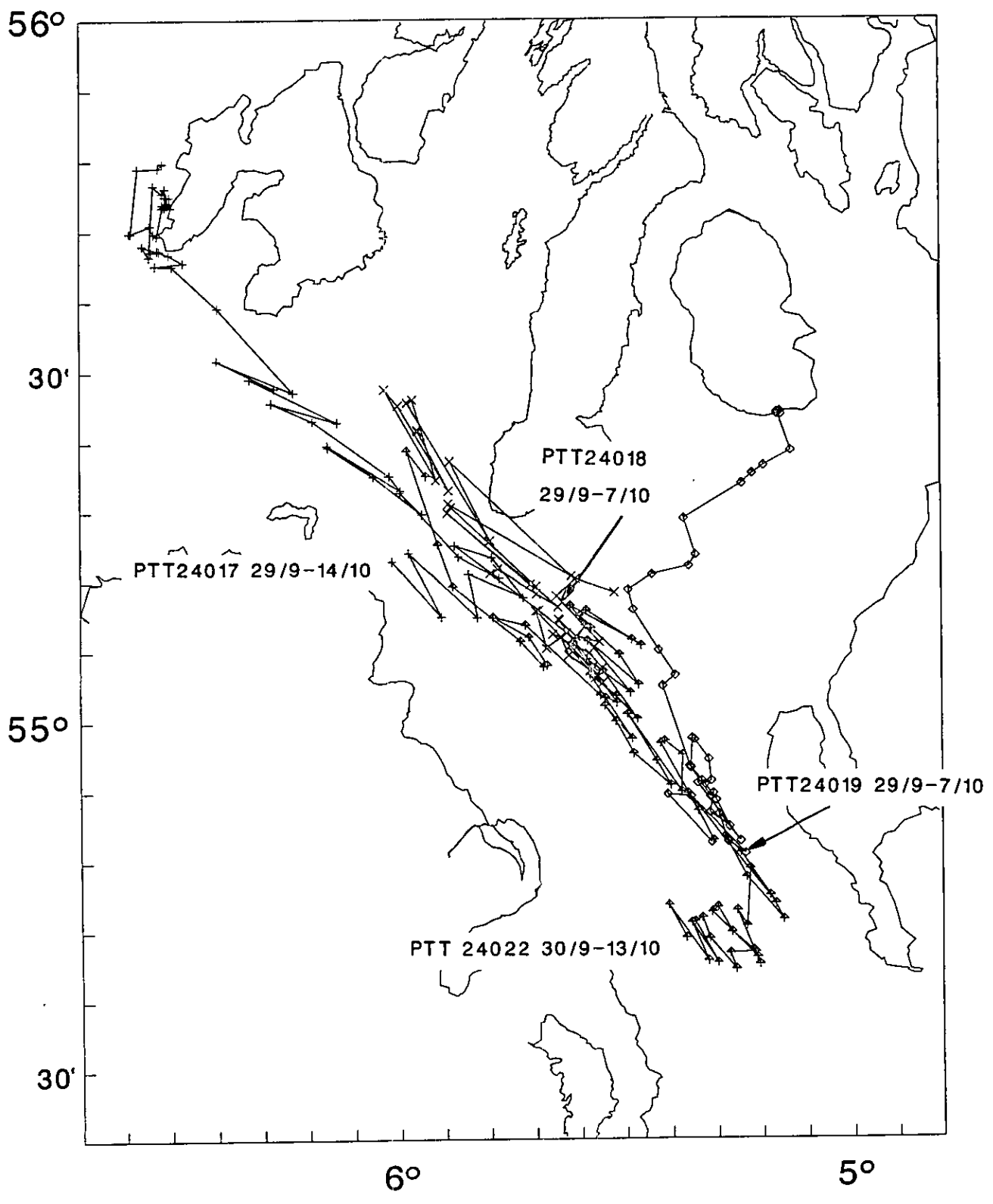


Fig. 4a

# Corystes 10/95

## ARGOS buoy tracks





Corystes 10/95

ARGOS buoy tracks (cont)

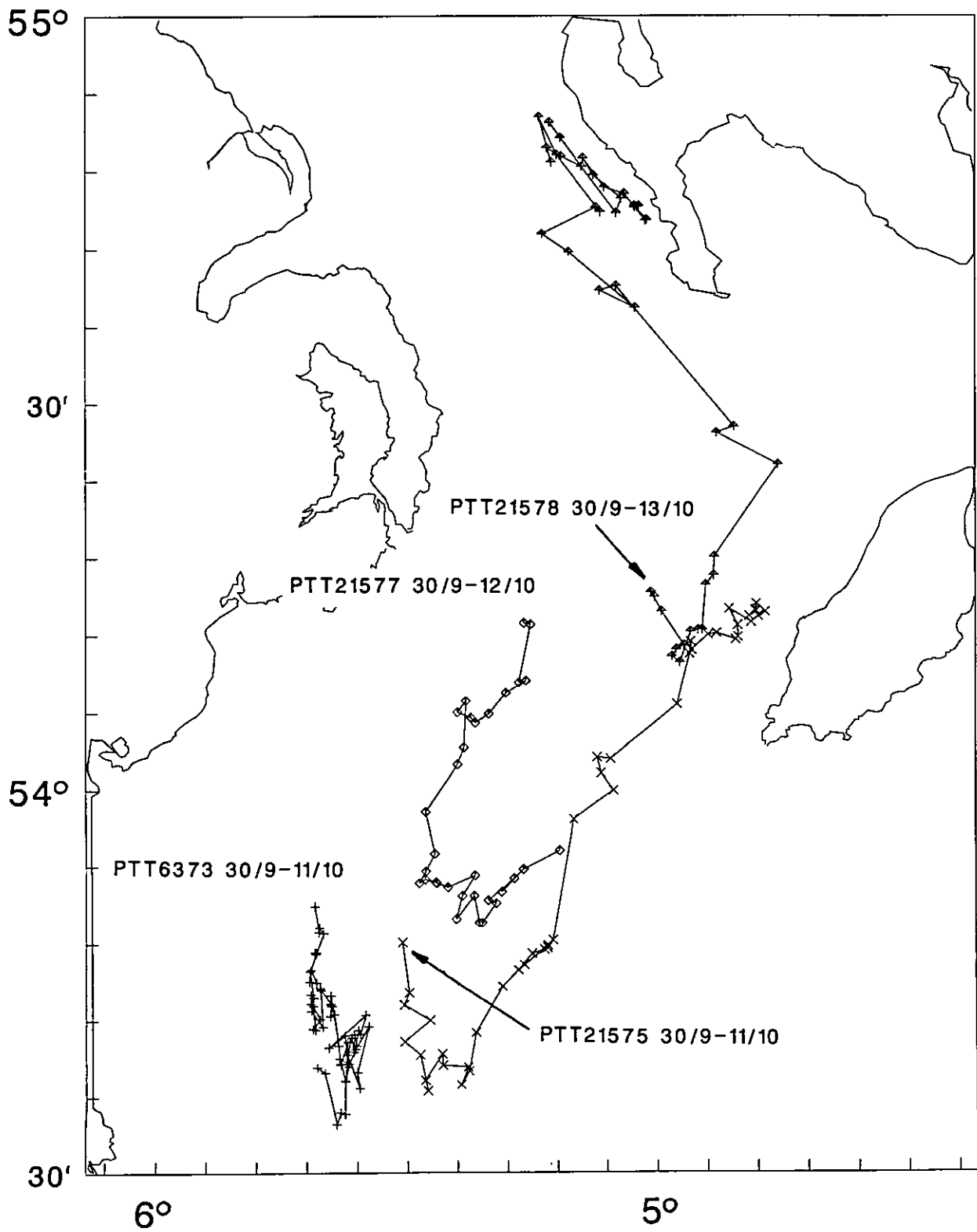
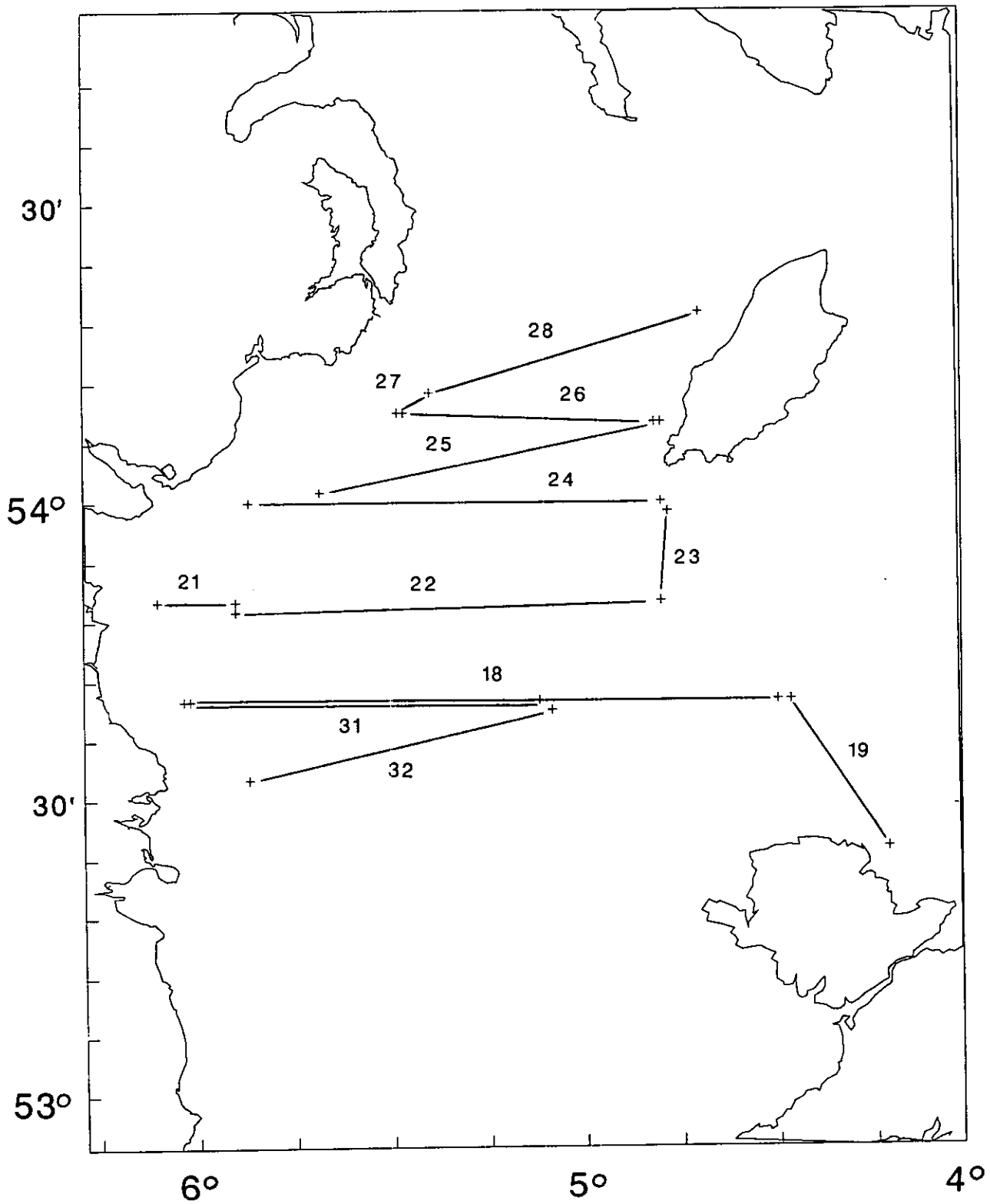


Fig. 5

Corystes 10/95

'SCANFISH' tows



Corystes 10/95 Density leg 18

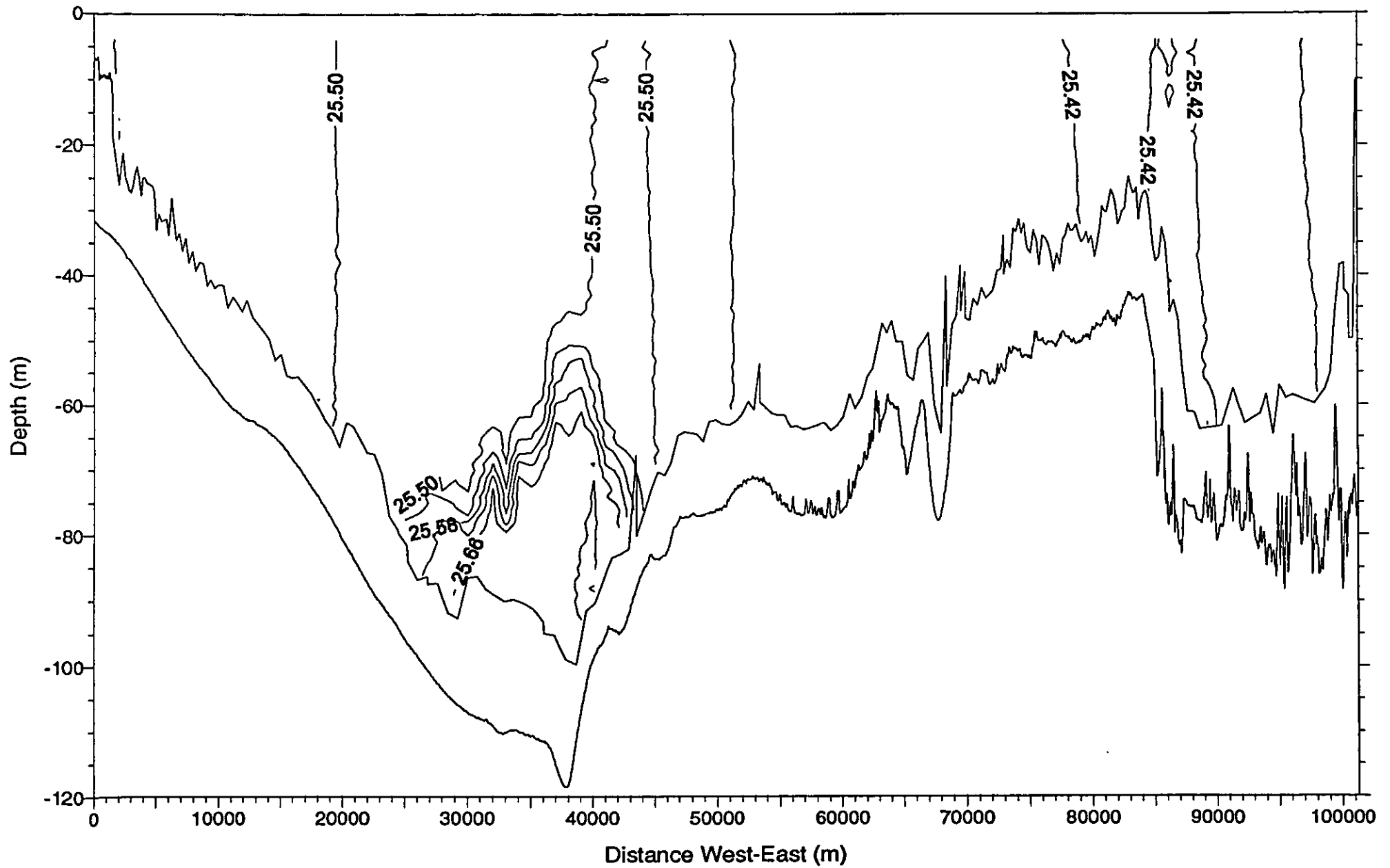


Fig. 6