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MINISTRY OF AGRICULTURE , FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK NR33 0HT, ENGLAND

1990 RESEARCH VESSEL PROGRAMME

REPORT : RV CIROLANA: CRUISE 1

STAFF

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12-19 January)

DURATION

Left Lowestoft 1500h 5 January 1990
Arrived Lowestoft 1445h 19 January 1990
All times Greenwich Mean Time

LOCALITY

North east coast of England

AIMS

1. To lay a line of current meter moorings.
2. To undertake repeated lines of CTD stations in the vicinity of the current meter moorings.
3. To deploy the tetrapod for zero offset deployments and for 12 and 24 hour anchor stations, depending on the weather conditions. Most deployments will be in and around the Marsden Bay area, but one may be on a sandy area of the Dogger Bank.
4. To undertake grab sample and side-scan sonar surveys of the area as necessary.
5. To recover and relay the current meter moorings at the end of the cruise.
6. To deploy the tetrapod with three guard buoys for a 48 day experiment to examine the effects of storms on the resuspension of sediments.

NARRATIVE

RV Cirolana sailed from Lowestoft on the afternoon tide of Friday, 5 January, and after some tests of a prototype radar tag for the 'Sea Rider' she proceeded to the working area of Marsden Bay, just south of the mouth of the River Tyne. On arrival the following morning, four current meter moorings (A-D) were laid running off-shore from Marsden Bay.

Five CTD stations were then worked along this line of current meters.

On Sunday morning, 7 January, the new logger and slave pressure cases on the tetrapod were given a pressure test before the tetrapod was deployed for 22 hours. CTD stations were worked for 13 hours from the anchored ship to collect water samples for suspended particle size and load. The location for the tetrapod deployment was the same as that used for the majority of deployments during Corystes 8/89 and 11/89.

Following the tetrapod recovery, a grid of Day grab stations was worked to check on the nature of the seabed. This was followed by a side-scan sonar survey of the area and a second deployment of the tetrapod at the same site. Again, CTD stations were worked for suspended loads and particle size determination along with quissets for determination of particle settling velocity. Before recovery of the tetrapod, the ship steamed around the area trying to pick up a signal from a transponding tag using the ship's SM600 sonar. A range of approximately 2.5 km was achieved. The side-scan sonar survey was resumed and a test of the triple-frequency acoustic backscatter monitor (ABM) was conducted.

On the morning of the 9 January, RV Cirolana deployed the tetrapod at the same location, together with 3 guard buoys, before steaming to the Dogger Bank in search of a suitable sandy site for a further deployment. After a side-scan sonar survey and a Day grab survey a suitable site was found, but because of the swell in the area, it was decided that it was not practicable to use the site this cruise.

RV Cirolana returned to the River Tyne to change scientific staff on Friday, 12 January, before proceeding to recover the tetrapod in Marsden Bay. Again the ship's SM600 sonar was used to detect the transponding tag. Further attempts were made to locate a sandy site for a tetrapod deployment further south along the coast, before a line of CTD stations were worked along the line of the current meter moorings. The following morning, suitable sandy sites were sought to the north of the Tyne. One was located in approximately 20m water depth in Alnmouth Bay, where the tetrapod was deployed. CTDs were worked for 25 hours for suspended loads and particle size determination, along with quissets for settling velocities. Before recovery, a Reinecke core was taken to provide samples for resuspension studies in the laboratory.

On Monday, 15 January the tetrapod was recovered from Alnmouth Bay, a line of CTD stations worked along the current meter moorings, before a Reinecke core was taken from the main tetrapod deployment site along with 3 quisset samples. The tetrapod was prepared for its long deployment.

On Tuesday, 16 January, the tetrapod and 3 guard buoys were deployed. In increasing winds, two current meter moorings were recovered and redeployed. After dodging in high winds until the morning of 18 January, the two remaining moorings were recovered and redeployed. Mooring B had been damaged and only one out of the three current meters was found. When recovering mooring D, the buoy chain

parted so the mooring had to be dragged for. All meters were successfully recovered.

RV Cirolana sailed for Lowestoft on Thursday, 18 January and docked on 19 January.

RESULTS

1. The current meters which were recovered had complete data records. However, one MO21F meter failed to record any speeds and the only current meter recovered from mooring D showed that the mooring had been damaged 3 days after deployment.
2. The CTD stations along the line of the current meter moorings gave reasonable estimates for geostrophic currents (see figure 1a density section, figure 1b currents section).
3. New software was written to manipulate and summarise data from the acoustic backscatter monitor (ABM), the e/m current meters, the miniature optical backscatter probes (MOBS) and the transmissometers.
4. Using the ABM, estimates of relative suspended particle concentrations were made but, at present, these profiles require further investigation.
5. Estimates of the shear velocity (U_*) from the tetrapod e/m current meter data (dashed line in Figure 2) compare reasonably well with simple theory (two lines close together in Figure 2). However, the results indicate that there may be a tidal asymmetry with a possible change in the bed roughness felt by the flow.
6. A number of tests were carried out to obtain the best gain setting for the MOBS. Figure 3 shows a typical burst of MOBS data with the chosen gain setting.
7. The surface salinity was logged continuously throughout the cruise using an Aanderaa current meter.

P A Gurbutt
(Scientist-in-charge)

19 January 1990

SEEN IN DRAFT ... *P. A. Gurbutt* (Master)
..... *J. Harper* (Fishing Skipper)

INITIALLED ... *SP*

DISTRIBUTION

Basic list +
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Cirolana 1/90 Section 2

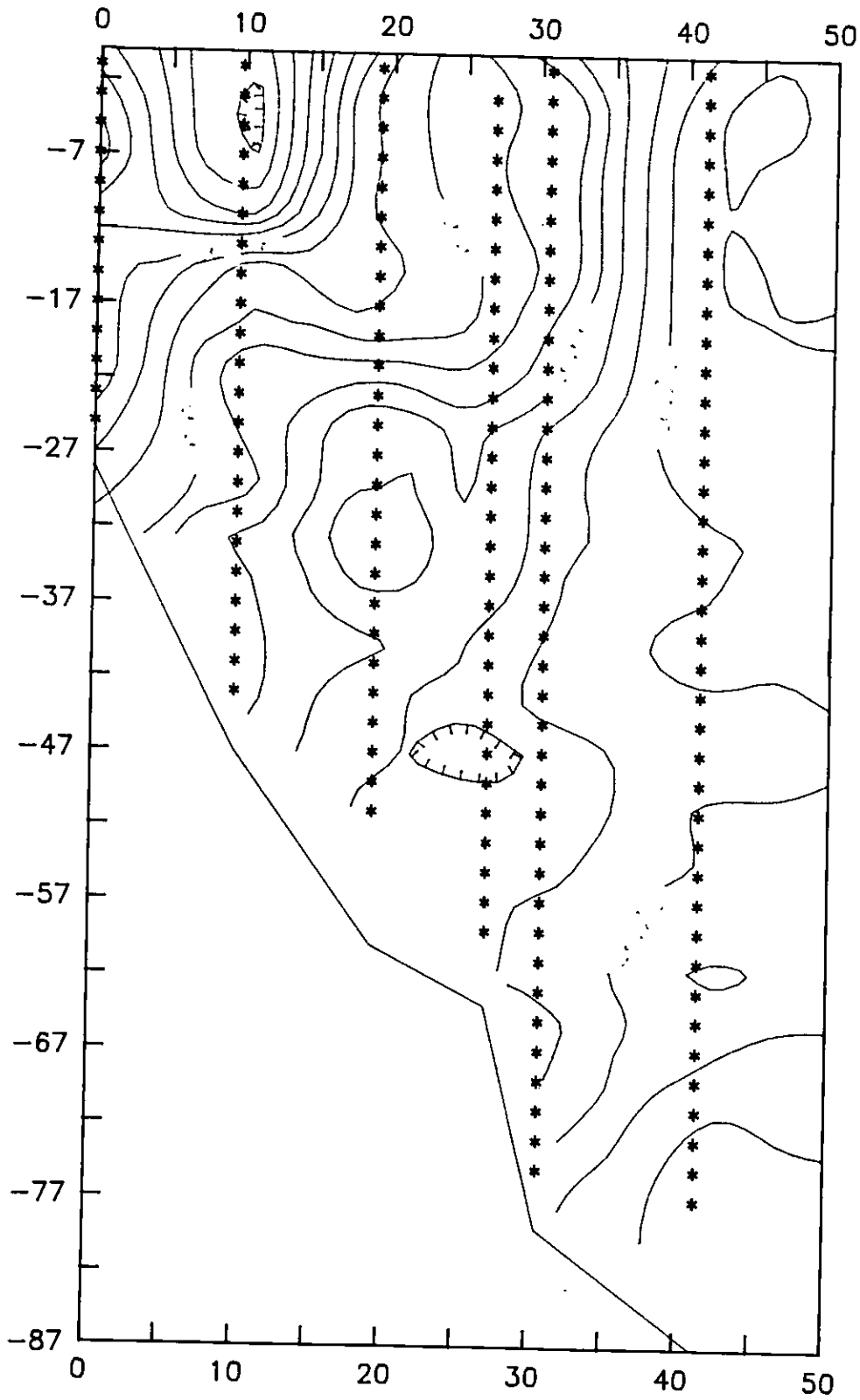
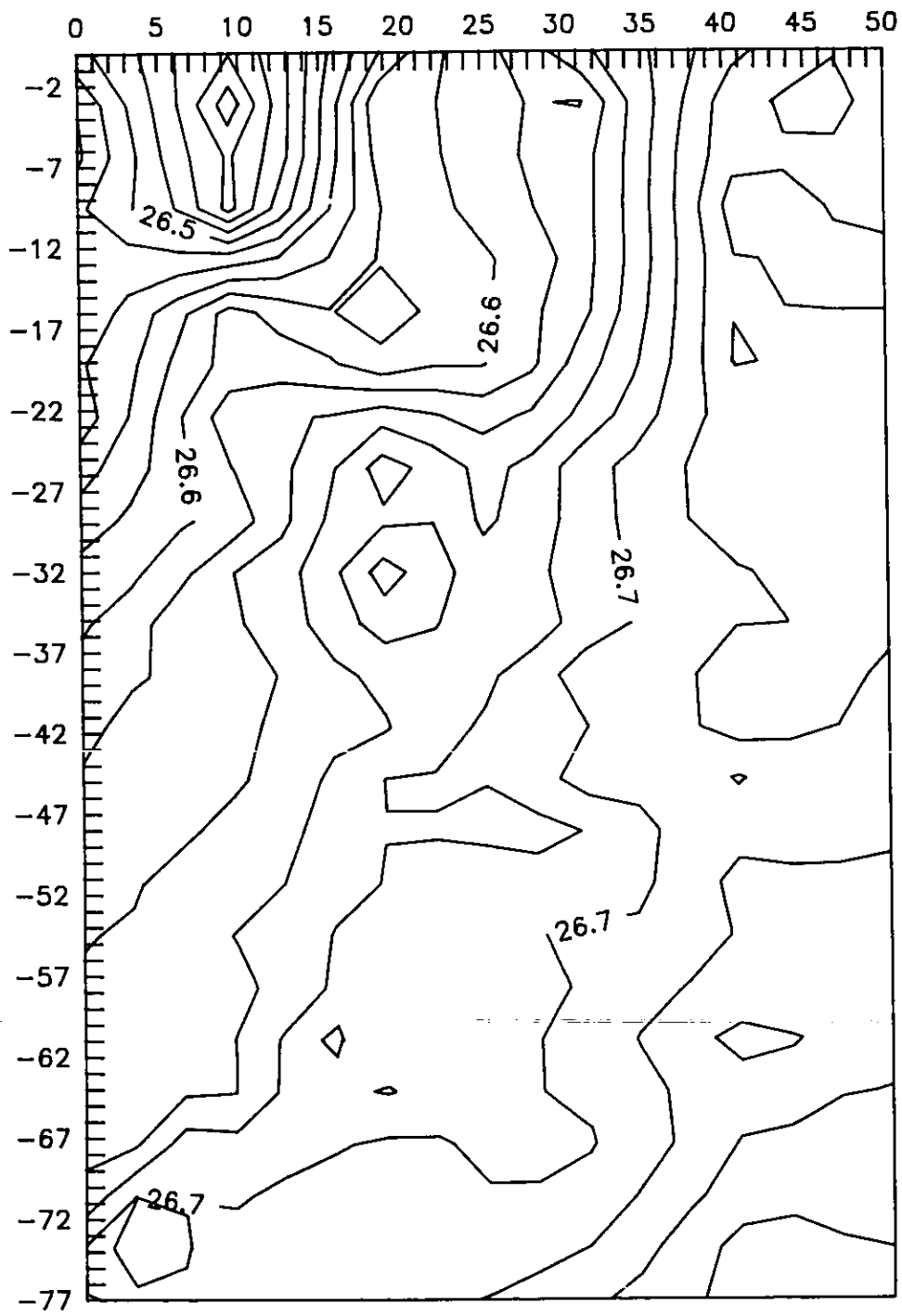


Figure 1a
Density Section



Cirolna 1/90 Section 2 Flows

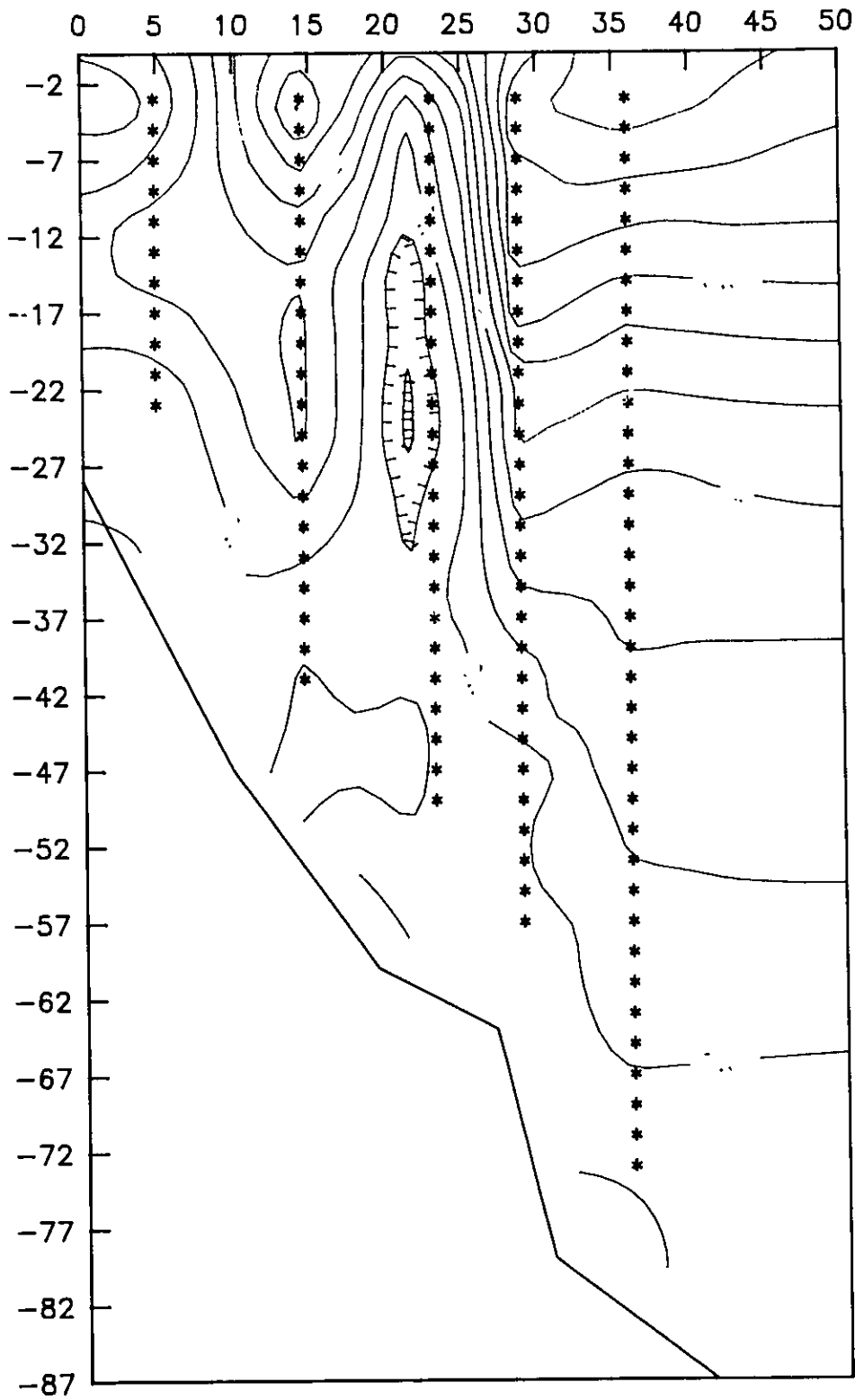
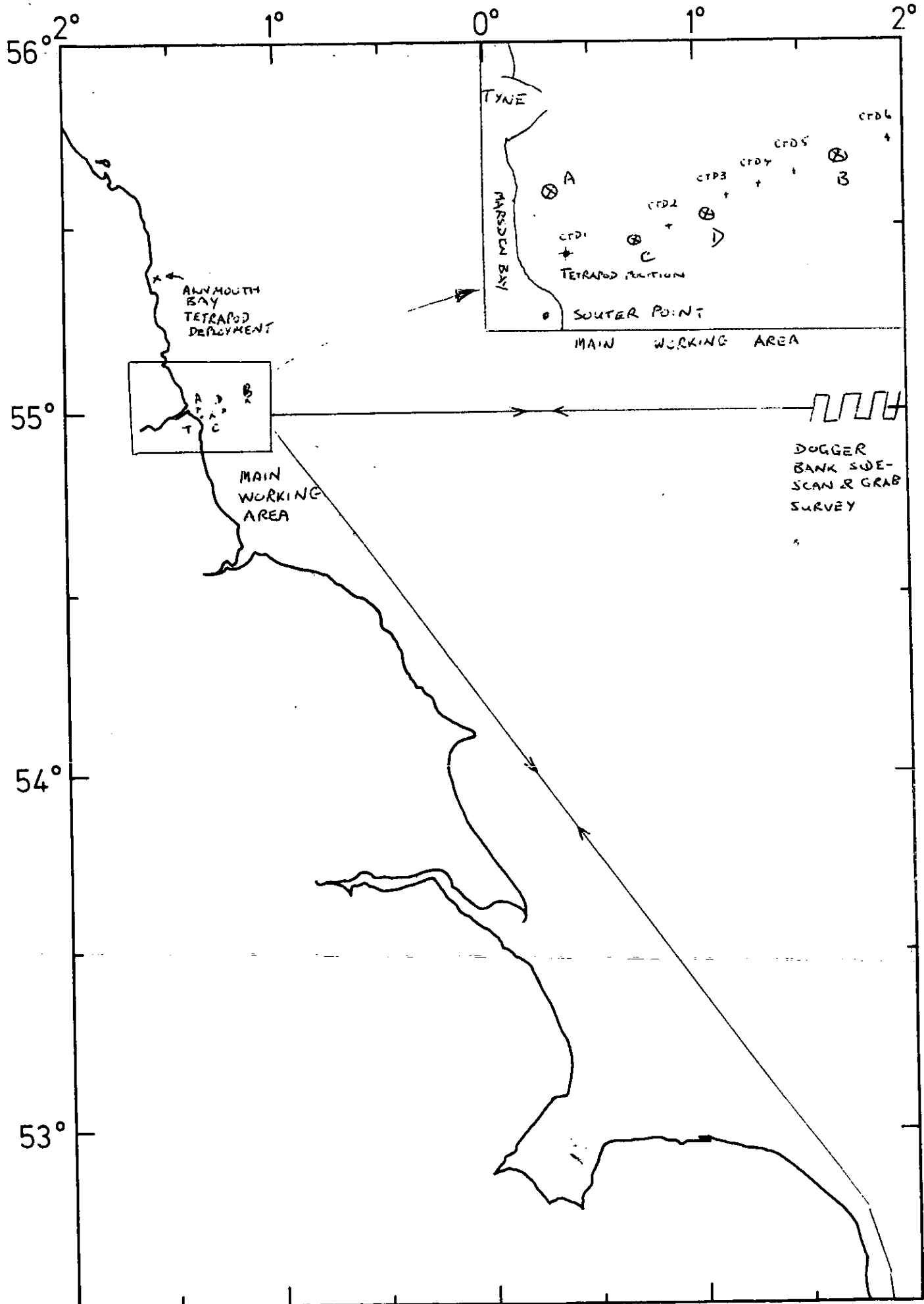


Figure 1b
Geostrophic Flows



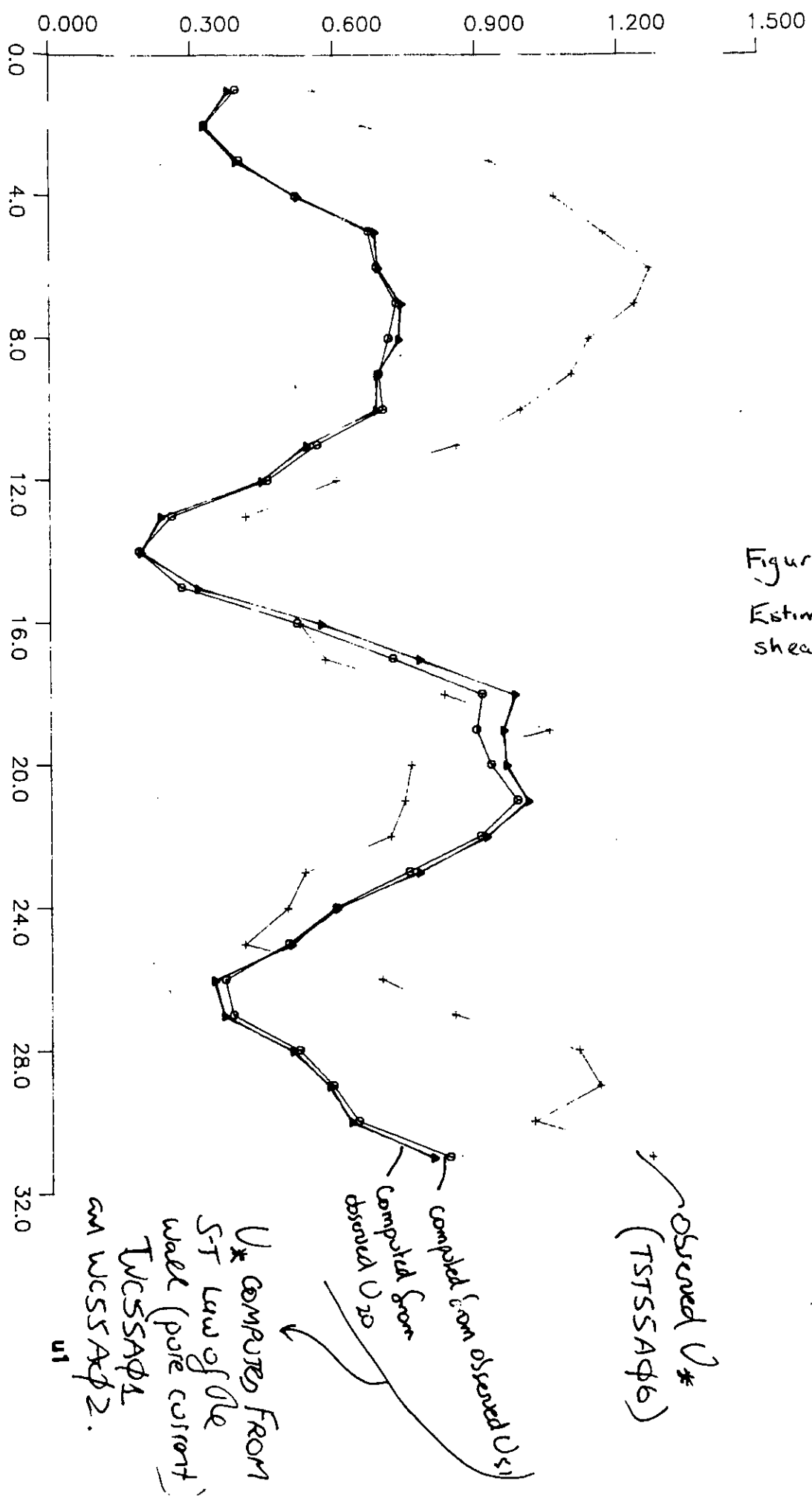


Figure 2
Estimates of
shear velocity

Observed U^*
(TSTSSAP6)

Computed from observations U^* (1)

Computed from observations U^* (2)

U^* computed from ST law of the wall (pure current)

TWSSAP1
GM WCSSAP2.

u^*

d55b1m2 (x100)

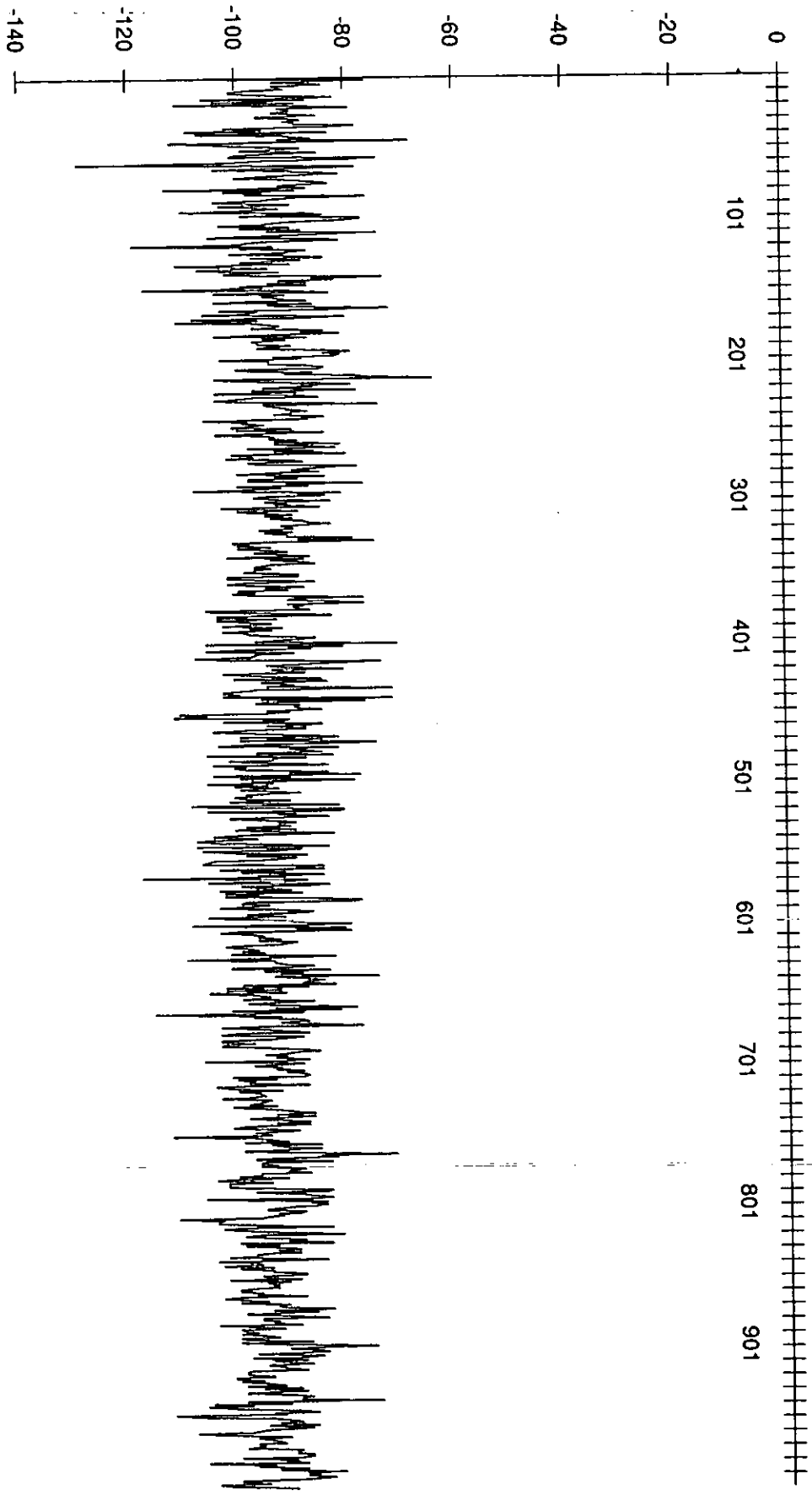


Figure 3
A typical MOBS record