Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: R L TAMARIS (IMER)
R L GAMMARUS (MBA)

CRUISE LOCATION: Tamar Estuary

CRUISE PERIOD: 29 September 1983

PERSONNEL
K R Dyer (Principal Scientist)
A L New
J L Whellock
R Palin (IOS Bidston)
R J Uncles (IMER)
J Stephens (IMER)

OBJECTIVES: Previous work in the Tamar Estuary by the Institute of Marine Environmental Research had shown that at neap tides, in one reach of the estuary, stratification gave way very rapidly to vertically homogeneous conditions. It was thought that this might have been caused by breaking internal waves. The measurements were aimed at detecting these internal waves and measuring their characteristics.

PROCEDURE & METHODS: The research launch Tamaris was anchored in a deep water area off Weir Point in the Tamar Estuary just above the junction with the Tavy (Figure 1). From this vessel half hourly profiles of current speed and direction, salinity, temperature and suspended solids were taken through the water column using IMER instruments. In addition a CTD (Conductivity-Temperature-Depth) probe from IOS Bidston was suspended near the halocline to record on magnetic tape the fluctuations in salinity at frequencies less than 1 Hz. Measurements were carried out over an entire tidal cycle.

During the ebb tide the research launch Gammarus carried out echo sounding surveys from the Tamar Bridge to above Car Green. Echo sounders of 200 KHz and 2 MHz were used to measure the backscattering of material associated with the halocline, and thence locate internal waves. Position fixing was carried out by transits with beacons, buoys and shore markers.

EQUIPMENT PERFORMANCE: All equipment performed satisfactorily, though the 2 MHz echo sounder experienced electronic noise that worsened during the day.

RESULTS: The echosounding revealed the presence of several small fronts around and after high water. These showed on the surface as slicks. It is not clear yet whether the passage of these features past the anchored CTD showed significant salinity differences. During the ebb tide internal waves appeared in the deep area near Car Green apparently caused by the topographic step at the upstream end of the deep. These waves progressed

upstream as the ebb current diminished. Unfortunately as this was upstream of the moored vessel the effect of these internal waves on the salinity structure remains undetermined. However other internal wave motions were apparent on the CTD records at times, though their recognition was hampered by the lack of a continuous chart recorder output.

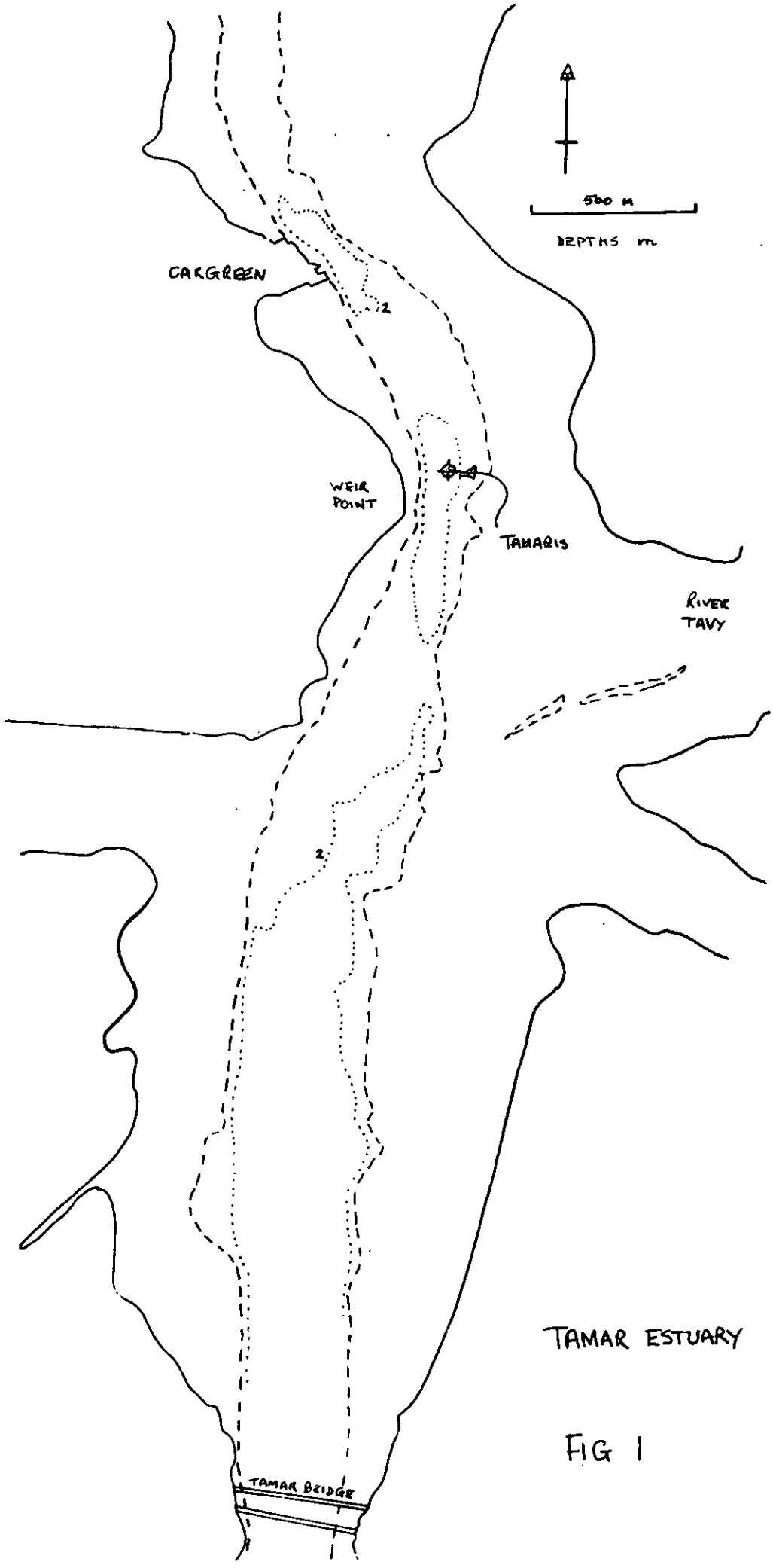
ITINERARY:

28 September 1983	Personnel travelled to Plymouth and set up equipment on the vessels.
29 September 1983. HW 1011 LW1658 HW2239	Tamaris departed 0600. Anchored 0730 and commenced half hourly profiles. CTD recording commenced 0751. Gammarus departed 0800. Commenced echo sounding at 0900. Completed echo sounding 1735. Returned to berth 1815 and unloaded boat. Tamaris completed measurements 2000. Returned to berth 2115.
30 September 1983.	Unloaded Tamaris, returned to Taunton.

Prepared by:

Approved by:

Date: 10 October 1983



TAMAR ESTUARY

FIG 1