Site Documentation: Mooring B (55°30'N, 5°31'E, water depth 52m)

This mooring was one of six current meter moorings deployed during the North Sea Project survey. It was situated in a region of weak tidal currents, up to a maximum of 0.5m/s. This, together with the water depth, produced stratified conditions during the summer. Magnetic variation at this site was 2.8 degrees west.

The mooring was first deployed on survey cruise Challenger 33 (CH33 - Aug 88) and recovered and redeployed on subsequent survey cruises. One mooring was lost and other moorings suffered damage. In addition some of the RCM7s did not perform well when measuring pressure, temperature and conductivity. The mooring was not deployed on cruises CH37 (Oct 88), CH41 (Dec 88), CH43 (Jan 89) and CH45 (Feb 89) because this site was not visited, CH47 (Mar 89) due to problems with the S4's lithium batteries and CH49 (Apr 89) due to bad weather. The current meters returned 77% good data when deployed. The data coverage over the 15 month period of the survey was 46%.

Mooring Configuration

A U-shaped mooring was used at site B. A 6m spar was used as a marker buoy, this was attached to the anchor by wire, the anchor was attached by a ground line to a further anchor, this was attached to a sub-surface buoy (a 0.8m diameter steel sphere). The four current meters were attached to this line, the top three meters, InterOcean System Model S4s, were 37m, 27m and 15m above the sea floor and the bottom meter, an Aanderaa RCM7, was 7m above the sea floor. The S4 measured vector averaged north and east components of current velocity. The Aanderaa RCM7 was deployed primarily to measure temperature, conductivity and pressure, although averaged current speed and direction were also recorded. The pressure sensor, not of tide gauge quality, was used as an indication of mooring stability.

InterOcean Systems Model S4 Current Meter

The InterOcean Systems Model S4 electromagnetic current meter is a self-contained 0.25m diameter sphere, with no protruding sensors. It measures current by creating a magnetic field and sensing the voltage induced in two orthogonal directions, by the movement of the sea water, an electrical conductor, through the field. This information is combined with instrument orientation, sensed by a flux-gate compass, and the north and east components of current computed. The S4s at this site were used in vector average mode throughout the survey. They sampled every 0.5 seconds and averaged the vectors over a 10 minute recording interval.

S4 specification

	Range	Accuracy
Speed	0 to 350 cm/s	+/- 2 cm/s
Direction	0 to 360 degrees	+/- 2 degrees

Aanderaa RCM7 Current Meter

The Aanderaa RCM7 current meter is a self-recording current meter. Temperature is measured by a thermistor fitted into a stud extending into the water. Conductivity is measured by an electrodeless induction conductivity cell and pressure is measured by a sensor consisting of a potentiometer driven by a Bourdon tube. A vane is attached to the meter in order to align the compass with current flow and keep the meter in an upright position. The speed of the current is measured with a half shrouded paddle wheel situated on top of the meter. During the selected recording interval of 10 minutes the number of rotor revolutions and the direction of the compass are sampled every 12 seconds and broken

up into north-south and east-west components. When the 10 minute recording interval has elapsed, the resultant average vector and its angle is calculated and recorded.

RCM7 specification

	Range	Accuracy
Speed	2 to 250 cm/s	+/- 2 cm/s
Direction	0 to 360 degrees	+/- 5 degrees
Temperature	-2.46 to 21.4 degC	+/- 0.05 degC
Conductivity	21 to 51 mmho/cm	+/- 0.025 mmho/cm
Pressure	0 to 100 PSI or 0 to 200 PSI	+/- 1%

Data Processing

After calibration, statistics were calculated from the data and a low pass filter was applied to produce six hourly values which were also statistically analysed. Standard current meter plots were produced in order to check data quality and aid in interpretation of the data.

In the table below each data file is identified by a mooring code (comprising the cruise during which the instrument was deployed and the site name), together with the instrument number, preceded by 'S' or 'A' indicating InterOcean S4 or Aanderaa respectively. The comments are ordered from the top meter through to the bottom meter. These can be cross-referenced with the data file names which comprise site name, month/year of deployment and instrument height.

Please note: these data have not yet been fully quality controlled by BODC.

Mooring/ Meter No.	Start Date dd-Mon-yy	Data Length (days)	Comment
C33BC/S1112	11-Aug-88	1.3	) Meter damaged shortly after deployment. Data record only 1.3 days.
C33BC/S1113	11-Aug-88	1.3	)
C33BC/S1114	11-Aug-88	1.3	)
C33BC/A9347	11-Aug-88	0.0	Meter damaged shortly after deployment. No data recorded.
C35BC/S1120	10-Sep-88	58.4	Good record obtained.
C35BC/S1119	10-Sep-88	58.4	Good record obtained. Hourly time stamp has jumped by 1 minute at 21:00 23 Oct 1988 to 22:01.
C35BC/S1118	10-Sep-88	58.4	Good record obtained.
C35BC/A9069	10-Sep-88	41.0	Velocity record short by 17.4 days. Temperature, conductivity and pressure records contain no good data and have therefore been excluded from the data set.
C39BC/S1120	07-Nov-88	0.0	) Mooring lost.
C39BC/S1114	07-Nov-88	0.0	)
C39BC/S1121	07-Nov-88	0.0	)
C39BC/A9348	07-Nov-88	0.0	)

C51BC/S1265	03-May-89	28.7	Good record obtained. Meter set up to sample for 10 minutes every 30 minutes.
C51BC/S1261	03-May-89	28.7	Good record obtained. Meter set up to sample for 10 minutes every 30 minutes.
C51BC/S1264	03-May-89	28.7	Good record obtained. Meter set up to sample for 10 minutes every 30 minutes.
C51BC/A9069	03-May-89	28.7	Good record obtained for current speed and direction. Pressure record contains no good data, temperature and conductivity records contain many spikes. These three channels have therefore been excluded from the data set.
C53BC/S1118	01-Jun-89	28.7	Good record obtained.
C53BC/S1112	01-Jun-89	28.7	Good record obtained.
C53BC/S1113	01-Jun-89	28.7	Good record obtained.
C53BC/A9069	01-Jun-89	28.7	Good record obtained for current speed and direction. Pressure, temperature and conductivity records contain many spikes. These three channels have therefore been excluded from the data set.
C55BC/S1264	30-Jun-89	30.2	Good record obtained. Hourly time stamp hasjumped by 1 minute at 19:50 18 Jul 1989 to 20:51.
C55BC/S1119	30-Jun-89	30.2	Good record obtained.
C55BC/S1113	30-Jun-89	30.1	Good record obtained.
C55BC/A9419	30-Jun-89	30.2	Many direction spikes, the major ones have been flagged as suspect by BODC. Pressure sensor indicates some instability on 14 Jul 1989.
C57BC/S1264	30-Jul-89	29.9	Good record obtained. Hourly time stamp has jumped by 1 minute at 20:07 18 Aug 1989 to 21:08.
C57BC/S1119	30-Jul-89	29.9	Good record obtained. Hourly time stamp has jumped by 1 minute at 20:11 24 Aug 1989 to 21:12.
C57BC/S1113	30-Jul-89	29.9	Good record obtained.
C57BC/A9069	30-Jul-89	29.9	Good record obtained for current speed and direction. Pressure record is full of spikes, the temperature record is several degrees too high, hence the salinity calculated will not be of any value. Temperature, conductivity and pressure have therefore been excluded from the data set.
C59BC/S1264	29-Aug-89	29.5	Good record obtained. Hourly time stamp has jumped by 1 minute at 20:45 17 Sep 1989 to 21:46.
C59BC/S1113	29-Aug-89	29.5	Good record obtained.
C59BC/S1118	29-Aug-89	29.5	Good record obtained. Hourly time stamp has jumped by 1 minute at 14:14 05 Sep 1989 to 15:15.
C59BC/A9347	29-Aug-89	29.5	Good record obtained. A few conductivity spikes occur near the end of the record (25 -27 Sep 1989).

Reference

Knight, P.J., Falconer, J. and Howarth, M.J. 1990. Current meter records Site B - 55°30'N 05°31'E August 1988 - September 1989 North Sea Project. Proudman Oceanographic Laboratory Report No. 13, 205pp