Site Documentation: Mooring F (52°37'N, 3°46'E, water depth 30m)

This mooring was one of six current meter moorings deployed during the North Sea survey. It was situated in a region of strong tidal currents, up to a maximum of 1.0m/s and in relatively shallow water. These factors produced well mixed conditions through the water column, throughout the year. Magnetic variation for this site was 3.1 degrees west.

The mooring was first deployed on survey cruise Challenger 33 (CH33 - Aug 88) and recovered and redeployed on subsequent survey cruises. Two meters gave no results and two meters had reduced good data return. The mooring was not deployed on CH41 (Dec 88) due to lack of equipment caused by losses at another site, CH45 (Feb 89) due to damage of equipment on recovery, and CH47 (Mar 89) and CH49 (Apr 89), because of problems with the S4's lithium batteries. The current meters returned 85% good data when deployed. The data coverage over the 15 month period of the survey was 60%.

Mooring configuration

A U-shaped mooring was used at site F. 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 two current meters were attached to this line, the top meter, an InterOcean System Model S4, was 12m 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 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 S4 at this site was used in vector average mode throughout the survey. It 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 angles 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
C33FC/S1117	05-Aug-88	30.6	Good record obtained.
C33FC/A9348	05-Aug-88	30.6	Comparison with the S4 meter above shows these north and east components of speed to be larger than expected. Salinity, calculated from conductivity, drops to approx. 34 PSU at the end of the record (04:32 06 Sep 1988). After redeployment (06:23 06 Sep 1988) the salinity is approx. 34.7 PSU. This suggests that the conductivity cell was fouled from about the beginning of September to the end of the record.
C35FC/S1121	06-Sep-88	26.4	Good record obtained.
C35FC/A9348	06-Sep-88	26.4	Comparison with the S4 meter above shows these north and east components of speed to be larger than expected. Pressure sensor indicates some instability on 13 Sep 1988 and 23/24 Sep 1988. Salinity, calculated from conductivity, jumps up by approx. 0.2 PSU from the end of this record to the start of the next record. There is about a two day gap between recovery and redeployment, so this change is possible but unlikely.

C37FC/S1121	04-Oct-88	28.6	Good record obtained.
C37FC/A9348	04-Oct-88	28.6	Good record obtained. Pressure sensor indicates some instability on 07/08 Oct 1988.
C39FC/S1117	02-Nov-88	29.8	Good record obtained.
C39FC/A9347	02-Nov-89	29.8	Good record obtained. Pressure sensor indicates some instability on 16 Nov 1988 - pressure values decrease suddenly by approx. 2m. Conductivity record very noisy.
C43FC/S1117	07-Jan-89	22.0	Good record obtained.
C43FC/A9347	07-Jan-89	9.6	Record short by 12.4 days. Meter damaged on recovery by prop. Conductivity record noisy.
C51FC/S1263	28-Apr-89	0.0	Meter did not record any data.
C51FC/A9347	28-Apr-89	0.7	Current velocity data record short by 18.1 days: Rotor clogged with fishing line.
		29.6	Good record obtained for temperature, conductivity and pressure, but note change in conductivity signal on 09/10 May 1989.
C53FC/S1119	29-May-89	27.1	Good record obtained.
C53FC/A9347	29-May-89	27.1	Good record obtained.
C55FC/S1265	25-Jun-89	0.0	Data corrupted.
C55FC/A9352	25-Jun-89	30.1	Good record obtained.
C57FC/S1261	27-Jul-89	28.2	Good record obtained. Hourly time stamp has jumped by 1 minute at 22:00 11 Aug 1989 to 23:01.
C57FC/A9352	27-Jul-89	28.2	Good record obtained. Pressure sensor indicates some instability between 27 Jul 1989 and 02 Aug 1989. Clock 5 seconds slow.
C59FC/S1261	25-Aug-89	27.3	Good record obtained. Hourly time stamp has jumped by 1 minute at 15:34 25 Aug 1989 to 16:35 and 12:35 10 Sep 1989 to 13:36.
C59FC/A9419	25-Aug-89	27.3	Good record obtained.

Reference

Knight, P.J., Falconer, J. and Howarth, M.J. 1990. Current meter records Site F - 52°37'N 03°46'E August 1988 - September 1989 North Sea Project. Proudman Oceanographic Laboratory Report No. 11, 158pp