

I.O.S.

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M. I. A. S.
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(BIDSTON)

RV EDWARD FORBES CRUISES 2/75 AND 3/75

27 JANUARY – 17 FEBRUARY 1975

19 FEBRUARY – 28 FEBRUARY 1975

EAST COAST SURVEY

CRUISE REPORT NO 19

1975

NATURAL ENVIRONMENT
INSTITUTE OF
OCEANOGRAPHIC
SCIENCES
RESEARCH
COUNCIL

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Institute of Oceanographic Sciences
Crossway
Taunton
Somerset

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Scientific Personnel

Dr J R Hails (Scientist in Charge)
A P Salkield
Miss H L King
R A Haine
Mrs B J Lees
C N Puckett
C J Walker (IOS Bidston)

Ship's Officers

P McDermott (Master 27 Jan - 17 Feb)
B Chapman (Master 19 Feb - 28 Feb)
K Avery (1st Officer)
M Tutman (2nd Officer)
J Richardson (Chief Engineer)

NB Cruise 3/75 was originally allocated to N C Kelland who is no longer employed by IOS. It was re-allocated to Dr J R Hails and thus, from the scientific point of view, Cruises 2/75 and 3/75 combined carried out a single continuous programme and this report covers both.

This report has been prepared by Mrs B J Lees in consultation with Dr J R Hails

Objectives

1. To deploy four Bergen self-recording current meter rigs along the 20m submarine contour on the eastern boundary of the study area (Fig.1) at the beginning of Cruise 2/75; to monitor continually current velocity and direction at midwater level to provide input data for a mathematical model (see Project SSG 220A); to recover the rigs at the end of Cruise 3/75; to lay a fifth meter mounted in a bottom frame near one of the buoy moored rigs in order to compare data from two types of mooring (NB. Allow for any depth difference).

2. To undertake a geophysical survey of the Sizewell-Dunwich Bank and adjacent seabed, using the Klein side-scan sonar, ORE pinger and ED10 boomer; the resulting data to be used for -

- (1) Accurate water depths (when used in conjunction with tide gauge data)
- (2) Indications as to the nature of the seabed, giving a basis for a seabed sampling programme to take place during a subsequent cruise
- (3) Subsurface information, providing a basis for future core sampling programmes with box corer and vibrocorer.

3. To obtain tidal stream data over 13 hour periods using a Braystoke direct reading current meter at as many stations as possible around and over the Bank, again to provide data for the mathematical model.

4. To undertake a preliminary seabed sampling programme in the study area, using a van Veen grab and a pipe dredge, the latter for the purpose of examining the biota (see Project SSG 220B).

It was planned that the ship would be day-running from Harwich during deployment of the current meter rigs, and from Lowestoft for the remainder of the cruises.

Cruise 2/75 : 27 January to 17 February

Current Meter Deployment

The first working day of the cruise should have been Thursday 30 January 1975, but adverse weather conditions prevented the RV Edward Forbes reaching Harwich until 4 February. J R Hails (Scientist in charge), B J Lees and C J Walker (IOS Bidston), joined the vessel on 4 February but unfavourable weather and sea conditions and engine repairs delayed the start of the planned scientific programme until 8 February.

Saturday
8 February Wind Force 3-4, conditions favourable. Work finally began after delay of nine days. J R Hails, B J Lees, C J Walker aboard. On Station 1 (Decca Red I22.0, Green C39.3) at 0800 hours, Bergen buoy moored current meter rig (see Fig 2) laid, second rig deployed at Station 2 (Ref J3.0, Green G38.6). Third (bottom) rig was on board, but deployment delayed until mechanism for fixing current meter to frame could be checked by C N Puckett. Vessel returned to Harwich and took on board 2 subsurface and 2 toroidal buoys for remaining rigs. B JL left for Taunton.

Sunday
9 February Buoy-moored rigs successfully deployed at Stations 4 (Red J9.5, Green C38.6) and 5 (Ref J15.5, Green C35.8). Vessel sailed for Lowestoft berthing at MAFF Quay. CJW left for Birkenhead. A P Salkield, R A Haine, P J Hardcastle arrived, the last-named to spend one night aboard prior to checking wave recorder equipment at Southwold.

Monday
10 February Dense fog all day prevented sailing. Geophysical equipment assembled and checked.

Geophysical Survey

Tuesday
11 February Geophysical survey commenced with ORE pinger, boomer, Klein side-scan sonar. Maglog not functioning, scientist detailed to note Decca readings for position fixing.

Wednesday
 12 February
 JRH left for Taunton. Geophysical survey continued, Maglog not functioning. Repaired and checked out during evening in port. At this stage all equipment functional.

Thursday
 13 February
 North to south zig-zag survey line over Sizewell-Dunwich Bank commenced. Boomer record intermittent owing to choppy sea. (Both ED 5 and ED 10 deployed). Klein recorder overheating, switched off and allowed to cool for 1 hour. This procedure was repeated when necessary. When recovered, Klein fish found to be minus tail fins, which would account for noticed loss in stability. All gear brought inboard by hand because of power failuer. (Ship's generator failed to supply winch motor). C N Puckett joined ship during evening.

Friday
 14 February
 Swell increasing, sea choppy. Boomer not deployed. 1220 hours ORE helix snapped, no spare aboard therefore boomer deployed, inshore north to south zig-zag survey line continued. Power failure caused loss of Decca readings, power reinstated. Decca correctly set and programme resumed and completed. Part of line with erroneous Decca readings not re-run as weather was deteriorating. Station 4 buoy marker light sighted at 3 miles.

Saturday
 15 February
 Bottom mounted current meter rig set up, deployed at Station 3 (Ref J9.6, Green C38.4). New EG & G tested and proved to be satisfactory. Vessel returned to port.

Sunday
 16 February
 Maglog packed for transport to Taunton. Klein side-scan sonar packed for transport to Edinburgh. Braystoke current meter rigged. APS, RAH, CNP left for Taunton.

Monday
 17 February &
 Tuesday
 18 February
 Hand-over from Master P McDermott, Cruise 2/75, to Master B Chapman, Cruise 3/75.

NB During the first cruise a smaller number of cod line fishermen was seen in the area than had been anticipated and therefore it was possible to work at night during Cruise 3/75. MAFF agreed to this arrangement.

Cruise 3/75: 19 February to 28 February

Tidal Stream Readings

Tuesday
18 February B J Lees and H L King joined vessel in Lowestoft.
Checked Braystoke equipment.

Wednesday
19 February Sailed 0800 hours. Wire on Monroe Davit marked
in metres, fish etc set up. Anchored at Station 6
(Red J11.5, Green C34.7). Water depth approximately
9m. At 1000 hours thirteen-hour sequence of readings
of current velocity and bearing from magnetic N
commenced. Readings at depths of 7m, 6m, 5m, 4m, 3m,
2m below surface, recorded every 15 mins. Water
depth (ship's sonar, giving rough guide only) and
Decca readings checked regularly. 2250 hours cycle
complete. Anchor weighed, new Station 7 (Red J5.8,
Green C35.2) taken. At 2350 hours 2nd series
readings commenced, at depths 9m, 8m, 7m, 6m, 5m,
4m, 3m, 2m below surface, taken at 20 min intervals.

Thursday
20 February 1256 hours cycle completed. Swell increasing.
Anchor weighed, Station 8 (Red I22.0, Green C37.9)
taken. 1335 hours readings commenced. Water depth
approximately 9m. Six readings recorded every
15 mins, as at Station 6. Ship's motion increased
sufficiently to cause irregular meter counts.
Winch therefore stopped, and readings taken every
10 mins at what would have been 5m below surface under
steadier conditions. Vertical movement of ship
meant that readings were taken at varying depths but
in 1 min (duration of count) reading would approximate
to that for an average midwater level. Despite
ship's motion Braystoke fish and cable held a near
vertical position and did not foul ship's hull
although power cable fouled fish once and had to be
disentangled. When sea subsided, profile measurements
resumed, and again when ship's motion increased
single depth readings taken.

Friday
21 February

0248 hours cycle completed. Fish brought inboard, vessel sailed for Lowestoft. All four toroidal buoy marker lights sighted, fifth (dan) buoy located on radar. Gear partially packed, completed on arrival at Lowestoft (0700 hours).
BJL and HLK left for Taunton. CJW joined ship during evening.

Current Meter Recovery

Saturday
22 February

Following is paraphrased from Report by C J Walker (IOS, Bidston). Weather deteriorating, forecast not good. Decided to commence with most southerly rig and work towards Lowestoft. Recoveries of four rigs went reasonably well.

Difficulties: 1. With hydraulic failures which covered deck with oil.

2. In closing with toroids. Manoeuvring whilst at anchor tried, unsuccessful in freshening wind.

3. With fifth rig. Serious delays owing to ship handling difficulties in rising wind. Toroid over-run by ship, eventually brought to stern when heavy line was attached and put over windlass.

Losses: 1. Section of wire cut from main winch leader after attachment to toroid was followed by immediate hydraulic failure.

2. Several grapnelling irons during approaches when lines attached to them parted under strain.

3. One Pains-Wessex light attached to Dan buoy mast.

4. Railway wheel, cut away as motion of ship would have made recovery too dangerous.

All meters were intact and functioning when recovered.

Sunday
23 February

CJW returned to Birkenhead.

Monday
24 February

Two toroids, two subsurface buoys offloaded at Lowestoft to return to Barry by road.
Reineck box corer (on loan to IOS Taunton by MAFF

Lowestoft) taken aboard.

Sailed for Barry c. 1200 hours.

Comments

The main problem has been the loss of ten working days from Cruise 2/75 because of adverse weather conditions, including gales, heavy seas and fog. This caused the sampling programme of the two cruises to be abandoned.

Deployment of the five current meter rigs was satisfactory, although recovery proved to be somewhat hazardous. Ship handling became difficult in the deteriorating weather conditions particularly with the fifth rig (buoy moored), and it was partly due to the fact that the forecast was of worse to come that the recovery of this rig was not abandoned. Several wires parted due to the severe strains placed on them, and difficulties were experienced with hydraulic failures. CJW lost his glasses and received bruising to his face when one wire parted. The current meters appeared to have functioned normally during the programme.

The bottom rig should have been placed in slightly shallower water; as it was, the buoy line was a little short and caused submergence of the Dan buoy, and flooding and therefore ruin of the light unit.

Despite problems, in this case malfunction of the Maglog, loss of the Klein fish tail fins, snapping of the ORE helix, occasional submergence of the boomer, and poor records from the last in choppy seas, the geo-physical programme was completed. Detailed study of the records will indicate where the quality of the data can be improved by subsequent field work.

There were no problems with tidal stream readings, except when a single depth reading had to be substituted for profile readings when the ship's motion became very marked.

We would like to thank the Masters for the two cruises, P McDermott and B Chapman, and the officers and crew of RV Edward Forbes for their help in making the cruises successful despite the working time lost because of the weather.

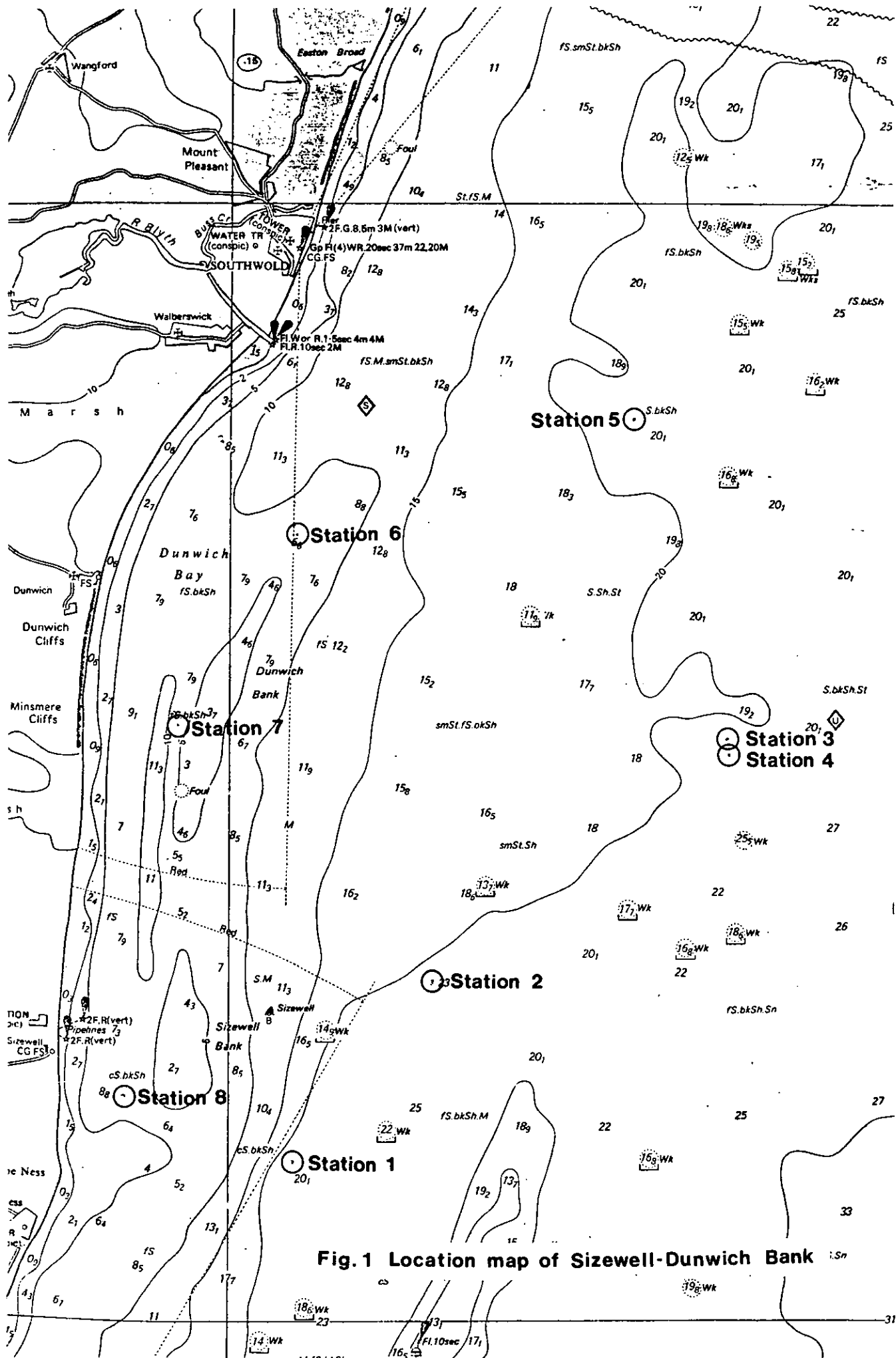


Fig. 1 Location map of Sizewell-Dunwich Bank

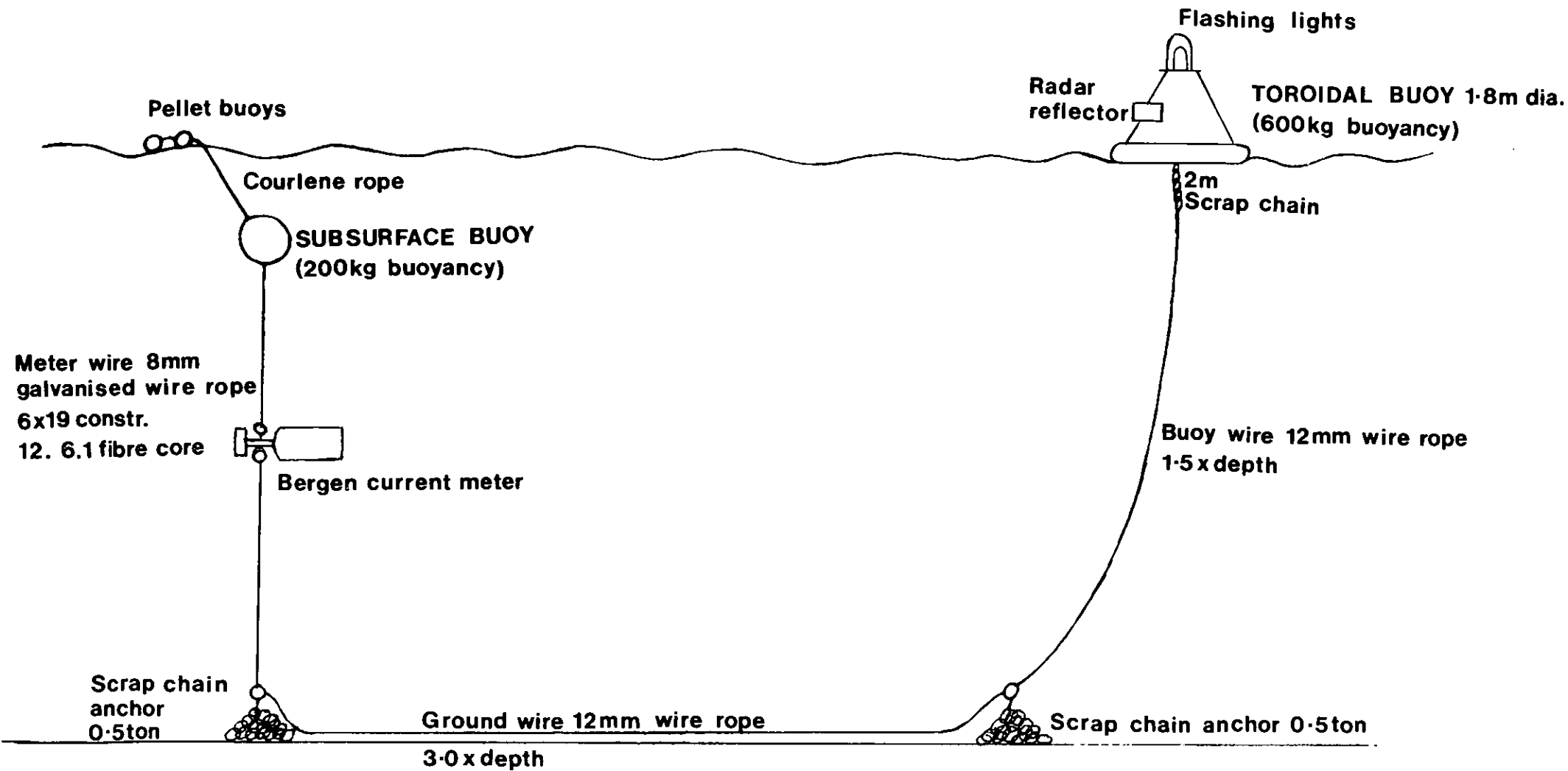


Fig.2 CURRENT METER MOORING SYSTEM I.O.S. BIDSTON