

This paper not to be cited without prior reference to the Council*

International Council for
the Exploration of the Sea

CM 1971/C:23
Hydrographic Committee

Preliminary report of the Working Group on permanent moored
current meter stations in the North Sea

Members

H. D. Dooley
Dr R. Ljøen
Dr H. Neumann
A. Svansson
K. van der Veen
J. W. Ramster (Chairman)



Terms of reference

Hydrography Committee C Res 1969/5:4

C Res 1970/2:15

The Working Group should "investigate the possibility of establishing and maintaining a permanent network of recording current meters etc. in the North Sea"

Report

This report is concerned solely with the logistics and viability of the moored current meter network established in the North Sea by the members of the Working Group in September 1970. A data report covering the period September 1970-September 1971 will be produced as soon as is possible.

Fig. 1 and Table 1 provide details of the positions of the ICES moored current meter stations. Table 1 also gives a first indication of the losses of meters and associated gear incurred at each station, estimates of the amount of ship-time that was required to keep the stations in being and of the speed of basic data-processing, and a preliminary assessment of the level of data retrieval. All these details are included because it is felt that they may help in the planning of future networks. An inter-calibration exercise was arranged during the period 28 June-2 July at a position 20 miles south-east of Lowestoft. Dr Neumann brought the RV GAUSS to Great Yarmouth and 3 stations were established with various combinations of Hydrowerkstatten, Plessey and Anderra current meters at

*Footnote: General Secretary, ICES, Charlottenlund Slot,
2920 Charlottenlund, Denmark

each, the latter being made available by the Institute of Coastal Oceanography and Tides, Liverpool. The results of this exercise will form part of the Working Group's data report.

Although the stations of the ICES network are still in being and the data that have been collected are only partially processed, the Working Group feels that there are two general points arising from its experiences that call for comment.

Firstly, the ICES network was, if anything, a little too informal and, because of this, tended to take a lower priority than other research work in each of the participating laboratories. Consequently, in all cases except that of the Fisheries Laboratory, Aberdeen, the time-lag between data collection and dissemination, for example, was of the order of 6-9 months, whereas 2-3 months had been expected. Such a time-lag was acceptable in this case, but with any future network it should be realized from the first that if basic data processing and assessment are required on a short-term basis the whole scheme needs to be given relatively high priority within the internal working of each laboratory. In particular it would be desirable that the Chairman of any future Working Group organizing such a scheme should be able to devote most of his time during the period of operation to the detailed running of the exercise. As far as permanent networks are concerned, this probably means that the position will have to rotate from year to year. Only when the Chairman is relatively free to look ahead and think about meeting deadlines is it likely that he will be able to hold the other participants to them.

Secondly, the existing means by which information about moored stations is passed to mariners in general and fishermen in particular does not appear to be good enough to meet the needs of scientists using relatively small marker buoys. The Lowestoft Laboratory, for example, pointed out to the British Admiralty the fact that at present radio warnings can only be broadcast for the first month of a moored station's life. The Admiralty noted in reply that firstly the radio-warning system had many other requests for help, and secondly that recent events around the Varne sandbank in the English Channel suggested that frequent warnings did not necessarily produce an ever-present awareness of great danger among ships' officers and watch-keepers. Nevertheless, it appears to the members of the Working Group that attempts should be made to ensure that poster and radio warnings about moored stations should be issued if possible by the ICES secretariat at bi-monthly intervals after moored current meter

networks have been established. Furthermore, those members of ICES who are not actually risking instruments at sea but who have large fleets of trawlers operating at times in the vicinity of one or other of the stations should be asked to provide advance notice of the likely presence of their vessels. There is no doubt that losses of instruments on a large scale and at frequent intervals, such as occurred during 1970-71 to both the German and UK participants, heightens considerably the risks that administrators of all nations will view with concern the cost of moored buoy networks, even though no other technique can provide such detailed information for such a relatively small capital outlay.

Since March 1970 several members of the Working Group (Mr Dooley, Mr van der Veen, Dr Neumann and Mr Ramster) have been concerned in varying degrees with the planning of a moored buoy network in the central and southern North Sea, based on the stations of the ICES pilot scheme but stemming from a rather wider range of interests in that meteorologists and coastal engineers are also taking part in the discussions. This network is a result of a series of informal meetings between representatives of government-sponsored laboratories in Belgium, Germany, The Netherlands and the United Kingdom. H. W. Hill of the Fisheries Laboratory, Lowestoft is presenting to the Hydrography Committee a paper in which the aims and organization of this network are described. It should be noted, however, that it has already been agreed that in order to preserve continuity of observation all of the ICES stations of 1970-71 established by members common to both planning groups will be kept in existence after September 1971 and throughout 1972, and others will be brought into being. It is hoped that it will be possible to maintain the stations put out by Norway and Sweden under the auspices of ICES, so that in effect a second year's data will be collected.

The Working Group views with great interest the coming into being of this enlarged North Sea network, since it is, in many ways, a natural development of the ICES scheme. Furthermore, because of its informal nature it should be relatively easy for any interested member of ICES to become directly involved with its implementation. A third feature of the scheme which appeals to the Working Group is the greatly enlarged range of observations complementing the basic oceanographic parameters of current velocity, direction and sea-temperature. As long as the latter are observed, the basic needs of fisheries oceanographers will be met, but the fact that other data of indirect but growing interest are also being

collected at the same time on a systematic basis is a very big step forward. On the other hand it is very noticeable on the chart that accompanies Mr Hill's paper (Doc. C:4) that in the early stages of this scheme there are few stations in the northern North Sea, and yet an established network there is crucial to any understanding of the general circulation pattern. The Working Group feels that every effort should be made to get additional long-term moored stations in this region. Alternatively, the re-establishing of the line of stations put out by the Deutsches Hydrographisches Institut from Scotland to Norway in 1962 (D.H.I. 1969) ought to be considered for relatively short periods at critical times during the yearly Atlantic Inflow cycle of September 1972-September 1973, via a series of exercises organized jointly by interested members of ICES.

Recommendations

The Working Group on permanent moored current meter stations in the North Sea, as a result of its experiences in establishing and maintaining 8 stations in the North Sea during the period September 1970-September 1971, notes that although instrument losses at particular stations were undoubtedly heavy, no other oceanographic technique can provide such detailed data on the circulation of the North Sea for such a relatively small capital outlay as the mooring of untended recording current meters. It recommends:

- (i) that in the organization of any future North Sea network it should be recognized that at any time at least one of the participants should be giving first priority to the day-to-day running of the network and the organization of data processing;
- (ii) that poster and radio warning to mariners about the presence of moored stations should be made at 2-monthly intervals after their establishment, and that, if possible, the organization of this warning system should be done by a central body such as the ICES secretariat. Furthermore, information about the likely presence of fleets of trawlers in particular areas should be circulated via the central body;
- (iii) that ICES should give every encouragement to the proposals for a North Sea moored buoy network made by an informal group of scientists from Belgium, Germany, The Netherlands and the United Kingdom. These proposals, in effect, mean that the ICES North Sea networks will be maintained and enlarged during 1972;

(iv) that if it does not prove possible to establish further long-term moored stations in the northern North Sea during the 1971-72 Atlantic Inflow cycle, the DHI line of 1962 should be re-occupied for short periods at critical times during the 1972-73 Inflow cycle via a series of joint cruises organized under the auspices of ICES.

REFERENCE

Deutsches Hydrographisches Institut, 1969. Strombeobachtungen 1962 Nordsee und Fehmarnbelt Meeres. Beo. und Erg. No. 27. Hamburg.

Fig.1 Stations of the I.C.E.S. North Sea network, 1970-1971

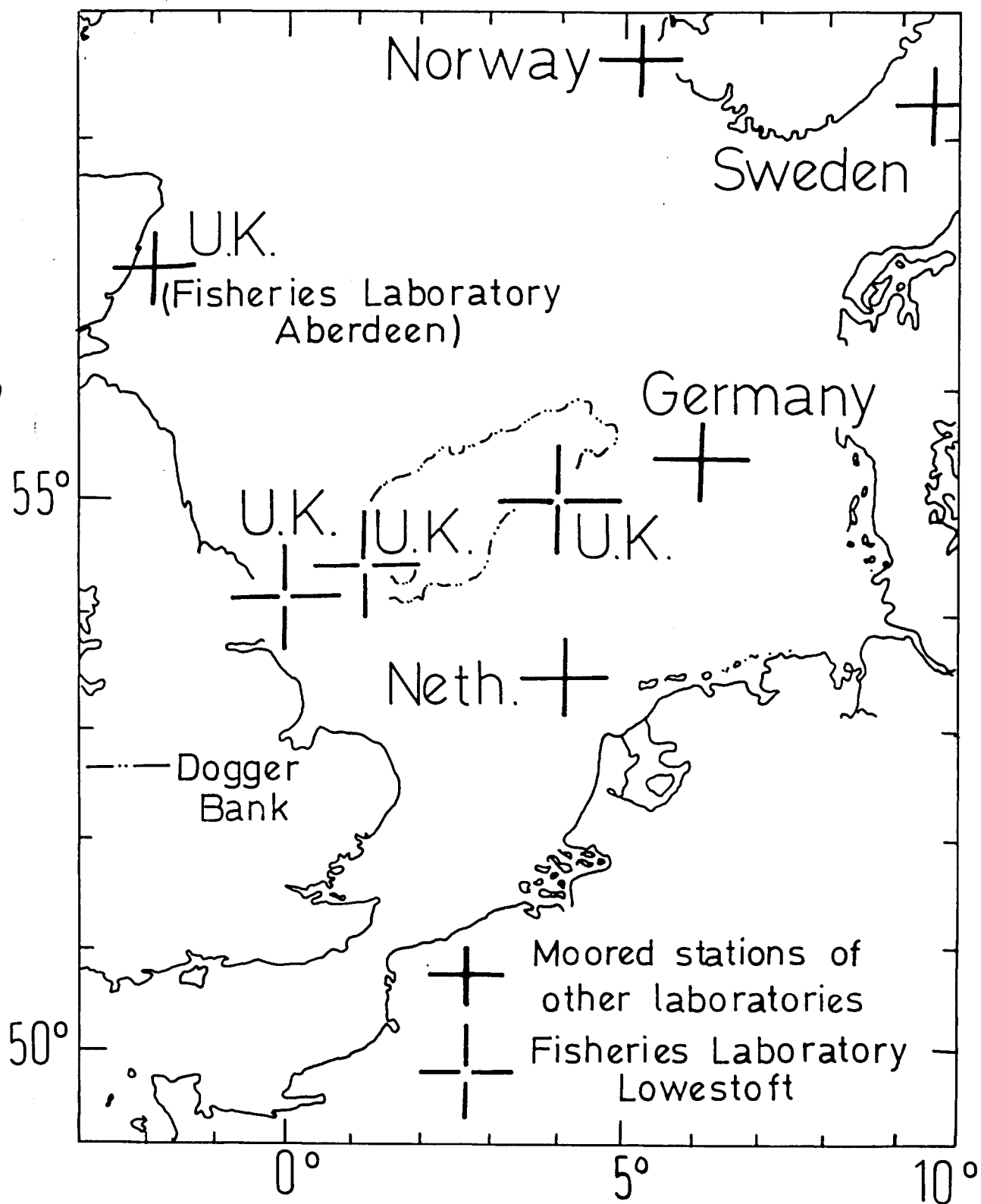


Table 1 continued

Country	Station position	Depth of station (m)	Date station established	Sampling depth (m) above bottom	Gaps in periods of observation	Reason for gaps	Numbers of meters lost to date	Number of ship-days spent in establishing and servicing stations	Net level of data retrieval*
United Kingdom	54°23'N 01°06'30"E (B)	53	15 Jan 1971	40.2 5.2	} 20 Mar 1971-24 May	Station trawled through or run down	2 of 6	To 23 Jul 1971 14 days, 7 to establish, 3, 2 and 3 to service	Not yet known
	55°00'N 04°00'E (C)	49	16 Jan 1971	38.4 5.2					

*of instruments recovered from sea

Table 1

Country	Station position	Depth of station (m)	Date station established	Sampling depth (m) above bottom	Gaps in periods of observation	Reason for gaps	Numbers of meters lost to date	Number of ship-days spent in establishing and servicing stations	Net level of data retrieval*
Germany	55°20'N 6°E		16 Sep 1970	?	(16 Sep-28 Oct 16 Dec- 6 Jan 1971 18 Feb-17 Mar	Stations trawled up or run down			
				?	(30 Sep-28 Oct 25 Nov-16 Dec 18 Feb 1971- 7 Apr	5 instruments beached in Denmark and in process of being recovered	9 of 19		
				1	(27 Oct-16 Dec 28 Jan 1971-18 Feb				
The Netherlands	53°25'N 3°55'E		26 Feb 1970	16	(26 Apr-29 May 23 Jun-26 Aug 11 Oct-26 Nov 1970 5 Jan 1971-16 Apr	Station trawled up or run down	2 of 16	12	80%
				6					
Norway	53°19.8'N 04°45'E		25 Nov 1970						
Sweden	58°14.6'N 11°03.4'E		14 May 1970		14 May 1970 onwards	9 Jul 1970: Fishermen complain rig is liable to foul nets	2 of 2		
			5 Mar 1971			12 Aug 1970: Instruments lost			
United Kingdom	57°18'N 1°54'W	22	31 Aug 1970	4	1 Dec-13 Dec 20 Jan 1971-31 May	Battery pack exploded. Heavy losses at other stations caused temporary withdrawal from site			91% (3102 of 3414 hours)
			15 Jan 1971	40.2 5.2	Nil Nil		0 of 6	Not yet known	
	54°13'40"N 00°01'40"E (A)	57							