Northwest Atlantic Fisheries Organization

Serial No. N1306

NAFO SCR Doc. 87/23

SCIENTIFIC COUNCIL MEETING - JUNE 1987

A Newly Developed Stratification Scheme for NAFO Divisions 2G and 2H

by

W. R. Bowering

Department of Fisheries and Oceans, Science Branch
Northwest Atlantic Fisheries Centre, P. O. Box 5667
St. John's, Newfoundland, Canada A1C 5X1

INTRODUCTION

Stratification schemes have been developed and used in groundfish surveys in NAFO divisions south of Div. 2GH since as early as 1972 for some areas. However, deficiencies in charting, accurate navigation technology, and limited biological knowledge of major species in northern waters have seriously impeded the development of good stratifications shemes for Div. 2GH although a basic design for the area was proposed by Messtorff (MS 1974).

In 1978, 1979, and 1981 Canada conducted surveys for groundfish in NAFO Div. 2GH using line transects across depth zones. The difficulty in this method is obtaining estimates of biomass necessary in the stock assessment process. In order to calculate biomass estimates of Greenland halibut for this area from these surveys Bowering (1982) attempted to "post-stratify" these divisions using the results of the cruises. Although some estimates were obtained the stratification schemes left much to be desired since many sets when plotted did not match the depths shown by the charts. This was the result of very archaic chartwork.

This paper will present newly developed stratification schemes for NAFO Div. 2G and 2H based upon state of the art chartwork by the Canadian Hydrographic Service of the Department of Fisheries and Oceans.

Materials and Methods

For many years the Canadian Hydrographic Service has been "sounding" northern regions although due to other higher priorities finalized charts have not been fully developed to release on the navigation market. However, for many areas small highly accurate charts have been contoured based upon these soundings. A graphical representation of these charts are shown in Fig. 1.

The necessary charts for Div. 2GH (Fig. 1) were obtained from the Canadian Hydrographic Service and a composite was made for each NAFO division. These composite charts were then stratified according to standard methods (Bowering 1982) using two basic criteria: 1) depth and 2) restricting the number of strata to that which likely could be surveyed in a standard three week cruise.

Results

The resulting stratification charts are shown in Fig 2 and 3 for Div. 2G and 2H respectively. A list of the strata, their depth range, and the area of each is presented in Tables 1 and 2 for Div. 2G and 2H respectively. In 1986 a Canadian cruise to these areas was initiated to survey for groundfish using these stratification schemes, however, due to mechanical difficulties with the vessel, only the southern portion of Div. 2H was surveyed (28 sets). Although the survey was incomplete there were no difficulties in locating the depths intended according to the positions indicated by the new chart.

Conclusions

It is important to realize that this stratification scheme was designed primarily to focus on deepwater species, particularly Greenland halibut. Therefore, the number of sets made in deeper strata (>200 m) would be disproportionately higher than those in depths <200 m (assuming for practical purposes a cruise of 200 sets). For surveys directed, for example,

towards cod (excluding depths >400 m), it might be necessary to further subdivide the large shallow strata to increase survey coverage where these areas are very important. These problems are presently under consideration by scientists at the Northwest Atlantic Fisheries Centre in St. John's, Nfld.

References

Bowering, W. R. 1982. Minimum trawlable biomass estimates of Greenland halibut in NAFO Divisions 2G and 2H from post-stratified groundfish surveys. NAFO SCR Doc. 82/100, Ser. No. N609. 8 p.

Messtorff, J. MS 1974. Revised stratification scheme for groundfish surveys in Subarea 2 and Division 3K. ICNAF Res. Doc., No. 4, Serial No. 3147.

Table 1. List of strata, depth zones, and stratum areas for NAFO Division 2G.

Strata	Depth range (m)	Area sq. mi.	
901	201-300	1213	
902	301-400	120	
903	401-500	80	
904	501-750	153	
905	751-1000	164	
906	1001-1250	229	
907	1251-1500	360	
908	201-300	585	
909	≤200	2773	
910	≤200	2339	
911	201-300	692	
912	301-400	73	
913	401-500	62	
914	501-750	113	
915	751-1000	96	
916	1001-1250	146	
917	1251-1500	165	
918	1251-1500	515	
919	1001-1250	316	
920	751-1000	172	
921	501-750	142	
922	401-500	186	
923	301-400	186	
924	201-300	756	
925	<200	1804	
926	201-300	433	
927	301-400	832	
928	401-500	783	Total = 16790
929	501-750	1261	

Table 2. List of strata, depth zones, and stratum areas for NAFO Division 2H.

Strata	Depth range (m)	Area sq. mi.	
930	≤200	1028	
931	201-300	276	
932	301-400	55	
933	401-500	50	
934	501-750	78	
935	751-1000	96	
936	1001-1250	78	
937	1251-1500	94	
938	1251-1500	191	
939	1001-1250	130	
940	751-1000	97	
941	501-750	89	
942	401-500	55	
943	201-300	354	
944	301-400	860	
945	401-500	461	
946	501-750	721	
947	501-750	227	
948	401-500	246	Some of this strata not fishable
949	301-400	206	" " " " " "
950	201-300	261	" " " " " "
951	401-500	234	
952	301-400	177	
953	201-300	291	
954	≤200	971	117≤100 m included in total
955	201-300	389	
956	≤200	1051	
957	≤200	1371	
958	201-300	294	
959	301-400	178	
960	401-500	107	
961	501-750	211	
962	751-1000	242	
963	1001-1250	265	
964	1251-1500	342	
	Total	11776	

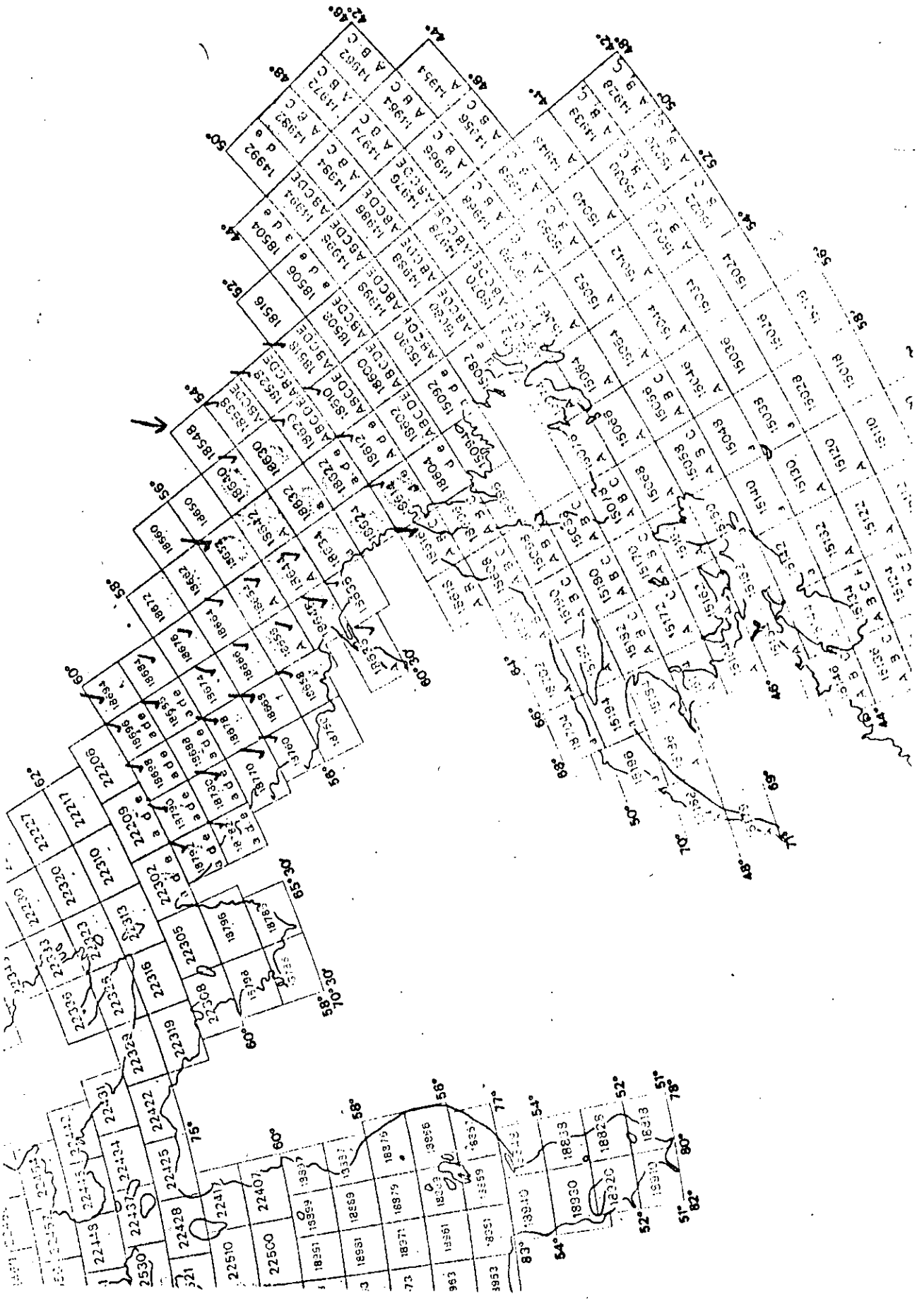

Fig. 1. Plot of work charts from the Canadian Hydrographic Service for certain areas of the Canadian Northwest Atlantic.

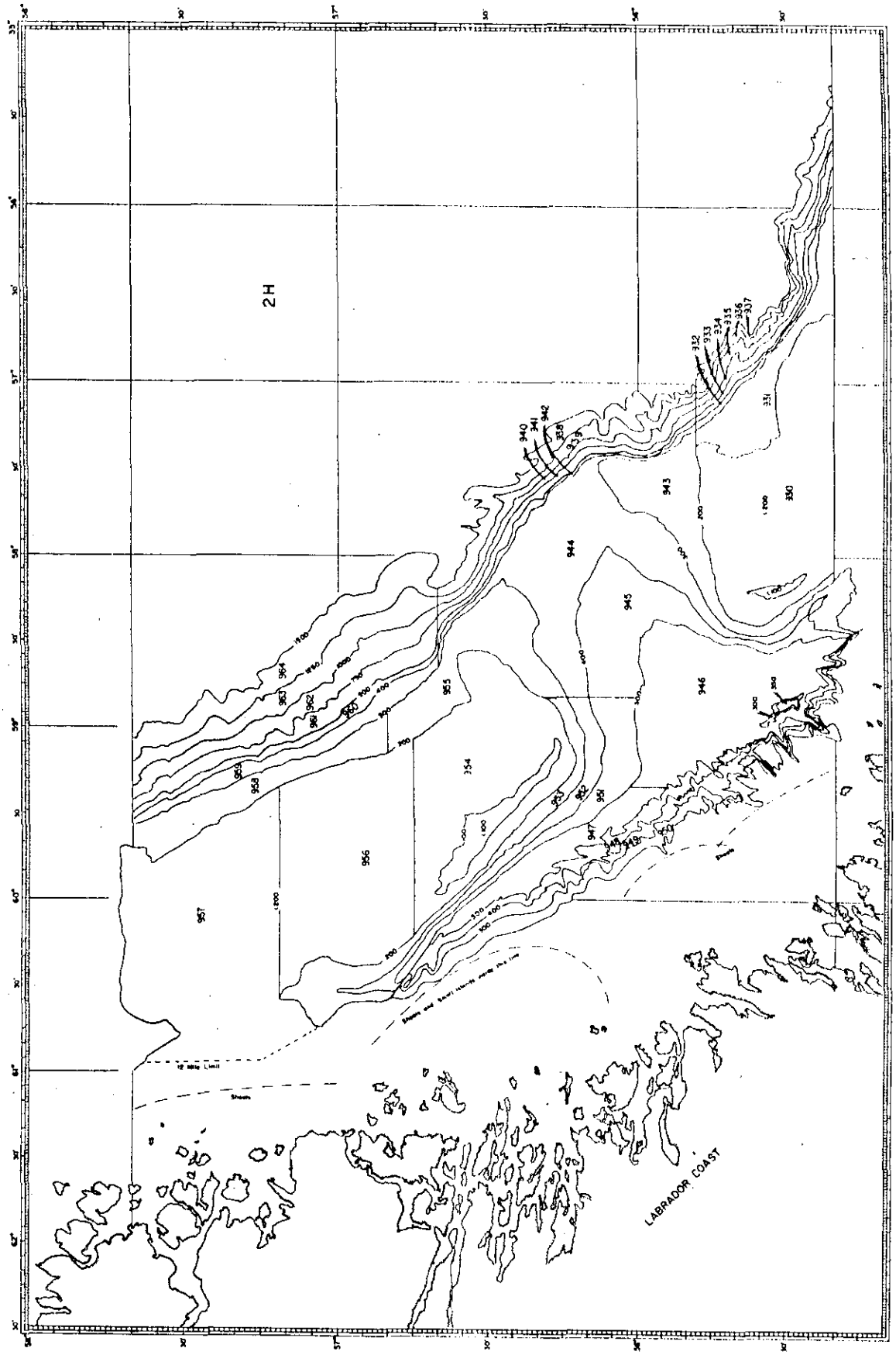

Fig. 2, Stratification scheme for NAFO Division 2H.

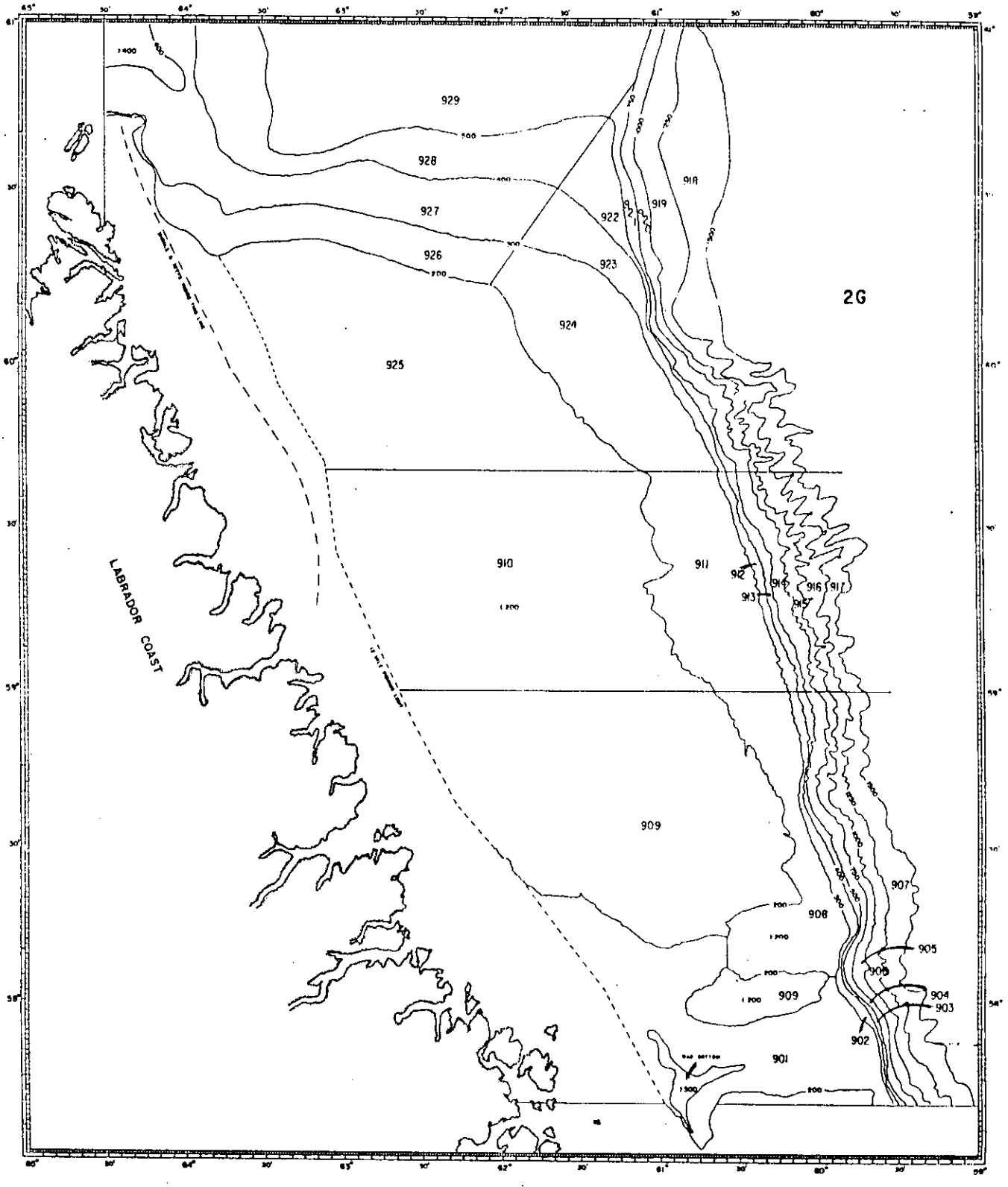

Fig. 3. Stratification scheme for NAFO Division 2G.