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Icelandic Research Report 1958

1. Cod

By Jón Jónsson

A. The Fishery

The Icelandic fishery in the Convention Area in 1958 was mainly concentrated on redfish in Subareas 2 and 3. During the months of July to December Icelandic trawlers made a total of 263 trips to Subdivisions 2J and 3K to new fishing grounds discovered by the Icelandic trawler "Fylkir" in the latter part of July. This fishery will be discussed more thoroughly by Dr. Jakob Magnússon, who was the scientific leader of the "Fylkir" expeditions, in his report on the redfish. The total Icelandic catch of redfish from these new fishing grounds was 77 thousand tons, compared to only 152 tons of cod.

Icelandic trawlers made 25 trips to Subarea 1 during the months January to September. The total catch of cod from this area was about 9600 tons, compared to 9700 tons in 1957. On the other hand, the catch of redfish was only 4 thousand tons, against 13 thousand tons the year before.

B. Biological Investigations

Figure 1 shows the age-composition of trawler-caught cod from some localities fished by Icelandic trawlers in 1958. For comparison the age-distribution of the Icelandic spawning stock of cod (January-May) in 1958 is also shown, but this material includes fish caught on long-lines.

In the Icelandic stock of cod there is a dominance of the 1949 and 1950 year-classes. The big year-class from 1945, 13 years old, was still contributing as much as 12 per cent to the total catch.

Sample "A" from Jónsmid (approximate position: 64°40'N, 35°00'W), which was taken during the period 12-20 April 1958, shows an age-composition which is very much like the Icelandic one. There is a clear dominance of the 1945, 1949 and 1950 year-classes and, further, of the 1947 year-class. This sample represents an almost pure spawning population, as most of the fish were actually spawning at the time of sampling. There were 52% first-time spawners. Most of the fish belonged to the first four spawning classes; one fish was found spawning for the ninth time.

Sample "B" from Fylkismib was taken 1-10 June 1958. It contains more young fish than the two previous ones, but the 1950 year-class is still dominating. Unfortunately, there is no information on sexual maturity for the sample.

Sample "C" from the Fiskenesbank off the west coast (position: 65°25'N, 52°43'W) was taken 11 July 1958. The 1953 year-class constituted about 25% of the catch, but the 1950, 1947 and 1945 year-classes constituted about 13% each.

Sample "D" from the new Ritubank off the Labrador coast (approximate position: 52°15'N, 51°35'W) was taken onboard the

trawler "Fylkir" during 20-23 September 1958. The depth at the sampling localities was 145-180 fathoms.

As stated earlier, the fishery in this area was almost exclusively based upon redfish, but samples were taken of the few cod caught. The age is mostly 3 to 6 years. Of the 282 fish included in this sample, 194 were immature, 106 maturing, 1 spawning, and 8 had recently spawned. The onset of maturity can be expressed by the following table, which shows the percentages of mature fish in each age-group:

<u>Age</u>	<u>% Mature</u>	<u>Age</u>	<u>% Mature</u>
2	0	7	62
3	3	8	62
4	14	9	67
5	32	10	80
6	43	11	100

A comparison between the average lengths of the age-groups in the various areas discussed here is shown in Table 1. In brackets are values based on five or less individuals.

The growth is by far highest in the Icelandic area, even if the observations there were made in the beginning of the year. There seems to be a gradual drop in the average sizes of the age-groups as we move to the southwest, with the lowest values found in the Labrador area.

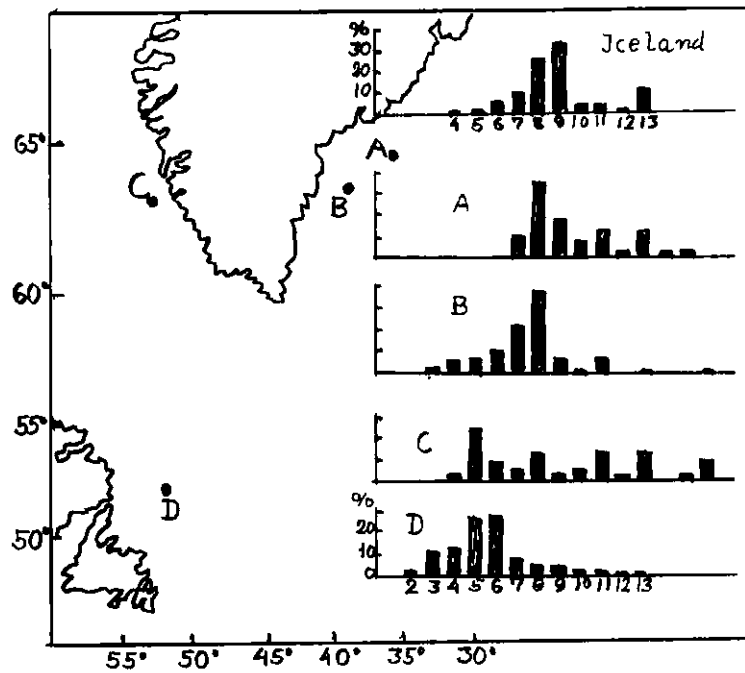


Figure 1. Age-composition of trawler-caught cod, 1958.

Table I.

Cod. 1958. Average sizes of the age-groups. For data and positions see the text.

Age	Iceland	East Greenland	West Greenland	Labrador
2				34.0
3	56.6			37.7
4	66.3			47.3
5	70.5		55.5	52.6
6	77.6		64.6	58.8
7	82.3	71.2	(71.2)	63.6
8	79.0	74.2	72.9	61.6
9	82.3	80.0	(74.5)	73.3
10	86.6	77.4	(75.8)	(78.4)
11	89.3	77.3	81.7	(82.8)
12	94.8	(90.0)	(77.0)	(70.5)
13	97.2	89.8	81.3	(101.0)

2. Redfish

By Dr. Jakob Magnússon

In 1958 two cruises were made with the commercial trawler "Fylkir" to the Labrador Sea and the Newfoundland area in order to search for redfish.

The first cruise was made from July 18th to August 2nd. Experimental hauls were made on the north and east part of the Hamilton Inlet Bank from July 22nd to 25th (see Figure 1, T-58) at depths of 180-285 fathoms. Temperature measurements were made at the trawl stations. The bottom temperature varied between 3.4°C. to 3.9°C. with the exception of the northernmost station, where the bottom temperature was 2.5°C. At station T58-8, worked on July 27th, only one haul was made at a depth of 230-240 fathoms; there, the bottom temperature was 3.3°C. At station T58-9, worked on July 27th to 29th, 18 hauls were made at depths of 145-220 fathoms. Here, the bottom temperature was 3.2°C. at 220 fathoms and just 3.1°C. at 170 fathoms. As is seen from Figure 2, below a thin surface layer warmed by the summer heating, a layer of cold water is spread over the Hamilton Inlet Bank. The core of this cold water is found at 100 m. Below this intermediate layer, a distinctly warmer bottom layer is found with temperature increasing downwards. As indicated by the 3.25°, 3.5° and 3.75° isotherms, the temperature of this bottom layer increases slightly from south to north.

Forty hauls were made at the Hamilton Inlet Bank. These hauls were rather poor, on the whole. At station T58-2 the hauls were somewhat better, with an average of 3 tons and a maximum of 6 tons per trawling hour. At station T58-9 an excellent catch was made. Here, 18 hauls were taken with an average of 13.5 tons per trawling hour. The largest hauls were about 22 tons in 75 minutes, and 17 tons in 40 minutes. This new fishing ground was given the name "Sundáll".

At the Hamilton Inlet Bank, the redfish were of a rather small size in all the hauls with the peak at 35-37 cms. At Sundáll, the larger size-groups appeared but there were great differences according to depth. It is worth noting that the size of redfish decreased with increasing depth. In this connection it should be noted that the bottom temperature increased with depth.

At 215-220 fathoms, the 34-36 cm. group made up the maximum and at 165-200 fathoms the 40-42 cm. group, while at 145-155 fathom depth the maxima were found at 40-42 cm., 46-48 cm. and 52-54 cm. Here, the size-groups making up the maximum at 215-220 fathom depth are nearly completely lacking, as sizes of 36 cm. and smaller were only making 6% of the total (see Figure 3).

As opposed to cruises in previous years to East Greenland and Icelandic waters during July, some spawning females were found during this cruise.

Samples of the stomach content of the redfish at the southernmost station (Sundáll) where the densest concentrations of redfish were found, differed from those of the other stations. Here, at Sundáll, the stomach content consisted mainly of Galanus hyperboreus. However, at the other stations some fish species were generally found in the stomachs, particularly Scopelids and Paralepis.

A marked infection by Sphyrion lumpi was noticed on the redfish of the Hamilton Inlet Bank. It varied somewhat in the different hauls, with a maximum of 10% of the fish being infected. The redfish at Sundáll, however, were almost free of this parasite, with the exception of a haul from 215-220 fathoms, where an infection of 1.6% of the fish was found.

The second cruise was made in the period from September 15th to 28th to the region south of the Sundáll Area (see Figure 1, U58). In this region experimental hauls were made from September 19th to 24th on the slope of the continental shelf at depths of 150-200 fathoms. Temperature measurements were made at the trawl stations. The bottom temperature varied between 2.7° and 3.7°C. The main features of the temperature distribution were the same as found during the first cruise: a thin surface layer warmed by the summer heating, an intermediate layer of cold water with the core at 75-100 m., and a distinctly warmer bottom layer with temperature increasing downwards, (see Figure 4).

As is seen from Figure 5, the salinity increased with depth from 32.50‰ at the surface to 34.75‰ at the bottom.

On the northernmost part of the area surveyed (U58-1/1 to 4/1) hauls were taken at depths of 160-200 fathoms. These hauls were rather poor, with a maximum of 3 tons in 40 minutes. On station U58-4/2 to 7/5 (see Figure 1) an excellent catch was made. This new fishing ground was given the name "Ritubanki". However, the best hauls were at the stations U58-5/4 to 5/13, at depths of 156-165 fathoms. Here 10 hauls were taken, with an average of 14.3 tons per trawling hour. The largest haul was about 20 tons after 40 minutes. In the whole Ritubanki area 38 hauls were taken at depths of 150-180 fathoms, with an average of 65 tons per trawling hour.

On the northernmost part of the area surveyed (station U58-1/1 to 4/1) the size of redfish was mainly 34-40 cm., whereas on the Ritubanki the 40-50 cm. size groups predominated. In hauls from the shelf, the redfish was smaller than at the slope. This is illustrated in Figure 6 which shows the length distribution of redfish at station U58-7/3, 7/4, 6/1 and 6/2 and 7/5. (For location of stations see Figure 1). The distance between stations U58-7/3 and 7/5 is about 18 n.m.

The amount of stomach content of the redfish caught at the Ritubanki was less than that of the fish caught in the Sundáll area in July, and empty stomachs were also more frequently observed, particularly as regards the males. Also during this cruise a great of the stomach content consisted of Calanus sp., but fish species were more numerous than at the Sundáll.

During the rest of 1958 Icelandic trawlers fished on these new fishing grounds and made excellent catches. In the period July to September Icelandic trawlers made 102 trips to Subdiv. 2J, with an average duration of 14.1 days per trip (see Table I). In September the catches were somewhat smaller than in July and August, as shown in Tables I and IV. This is confirmed by the longer duration of the trips and the number of hauls per trip. It should be mentioned that the July catches include the "Fylkir" expedition. Further, it is obvious that the catches of cod and halibut are of no importance compared to the catches of redfish. However, there is an increase in the catches from July to September.

Table II shows that 162 trips were made to Subdiv. 3K in the period September to December with an average of 15.4 days per trip; further, that the number of days per trip and the number of days' fishing increases from September to December, but the number of days per trip increased relatively more. This can be explained by bad weather conditions, as the catches were almost the same throughout the whole period with the exception of September (see also Table V; catch per one haul). The catch of cod and halibut increased in Subdivision 3K from September to December.

Table VI shows that the Icelandic commercial trawler fleet fishing Subdivisions 2J and 3K in 1958 is a very homogeneous one. The same type of gear was used by the trawlers.

The discovery of these new fishing grounds was of a very great importance for the Icelandic fishery in the year 1958. The total amount of fish caught by Icelandic vessels in 1958 was about 505 thousand tons. The total catch of redfish was about 110 thousand tons or 22% of the total catch, which is the highest yearly catch of redfish up to the present time. The total quantity of fish caught by Icelandic trawlers in 1958 was about 199 thousand tons, of which the redfish made up about 55%. The amount of redfish caught by Icelandic trawlers in Subdivisions 2J&3K was about 80 thousand tons or nearly 77% of the total Icelandic catch of redfish in 1958.

The fishery was continued until the beginning of February, 1959, when it was discontinued because of unfavourable ice conditions and bad weather. Since early May, 1959, the fishery has been resumed.

TABLE 1*

Catches of Icelandic Trawlers in Subdivision 2J in 1958.
Fishing Ground: Sundall

Month	No of Trips	Days Absent	Days Fishing	No of Hauls	Redfish Kgs	Cod Kgs	Halibut Kgs	Others Kgs	Total Kgs
July	4	53	11.8	138	1,138,722		390		1,139,112
Average		13.3	3.0	34.5	284,681		98		284,778
August	59	792	196.3	2,441	17,660,513	7,580	10,550	4,270	17,682,913
Average		13.4	3.3	41.4	299,331	128	178	72	299,710
September	39	591	201.5	2,250	12,156,028	15,560	17,665	2,280	12,191,533
Average		15.2	5.2	57.7	311,693	399	453	58	312,603
Total	102	1,436	409.8	4,829	30,955,263	23,140	28,605	6,550	31,013,558
Average		14.1	4.0	47.3	303,483	227	280	64	304,054

* The tables in this paper are to some extent based upon other sources than those from the Icelandic Fisheries Association so there may be a very slight difference in few cases.

TABLE II
Catches of Icelandic Trawlers in Subdivision 3K in 1958
Fishing Ground: Ritubenki

Month	No of Trips	Days Absent	Days Fishing	No of Hauls	Redfish Kgs	Cod Kgs	Halibut Kgs	Others Kgs	Total Kgs
September									
Total	14	194	42.6	472	4,173,887	10,270	1,705	1,200	4,187,062
Average		13.9	3.0	33.7	298,135	734	122	86	299,076
October									
Total	70	1,031	306.5	3,147	20,848,159	48,715	11,154	4,510	20,912,538
Average		14.7	4.4	45	297,831	696	159	64	298,751
November									
Total	48	773	226.4	2,192	14,335,318	97,425	4,423	6,500	14,443,666
Average		16.1	4.7	46	298,652	2,030	92	135	300,910
December									
Total	30	501	144.5	1,353	9,001,103	102,500	8,887	1,065	9,113,555
Average		16.7	4.8	45	300,037	3,417	296	36	303,785
Total									
Total	162	2,499	720.0	7,164	48,358,467	258,910	26,169	13,275	48,656,821
Average		15.4	4.4	44.2	298,509	1,598	162	82	300,351

TABLE III
Total Catch of Icelandic Trawlers in Subdivisions 2J and 3K in 1958.

	No of Trips	Days Absent	Days Fishing	No of Hauls	Redfish Kgs	Cod Kgs	Hallbut Kgs	Others Kgs	Total Kgs
Sundáll and Ritubanki	264	3,935	1,129.8	11,993	79,313,730	282,050	54,774	19,825	79,670,379
Average		14.9	4.3	45	300,431	1,068	208	75	301,782

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TABLE IV

Icelandic Fishery in Subdivision 2J in 1958.

Catch per-unit-effort

(In Kgs)

Month	Species	Catch per Day Absent	Catch per Day Fishing	Catch per One Haul
July	Redfish	21,485	96,502	8,252
	Cod	-	-	-
	Halibut	7	33	3
	Others	-	-	-
Total		21,492	96,535	8,255
August	Redfish	22,299	89,967	7,235
	Cod	10	39	3
	Halibut	13	54	4
	Others	5	22	2
Total		22,327	90,082	7,244
September	Redfish	20,569	60,328	5,403
	Cod	26	77	7
	Halibut	30	88	8
	Others	4	11	1
Total		20,629	60,504	5,419
July - September Total	Redfish	21,557	75,539	6,410
	Cod	16	56	5
	Halibut	20	70	6
	Others	5	16	1
Total		21,598	75,681	6,422

TABLE V

Icelandic Fishery in Subdivision 3K in 1958
Catch per-unit-effort.
(In Kgs)

Month	Species	Catch per Day Absent	Catch per Day Fishing	Catch per One Haul
September	Redfish	21,515	97,979	8,843
	Cod	53	241	22
	Halibut	9	40	4
	Others	6	28	0.3
	Total	21,583	98,288	8,872
October	Redfish	20,221	68,020	6,625
	Cod	47	159	15
	Halibut	11	36	4
	Others	4	15	1
	Total	20,283	68,230	6,645
November	Redfish	18,545	63,319	6,540
	Cod	126	430	44
	Halibut	6	20	2
	Others	8	29	3
	Total	18,685	63,798	6,589
December	Redfish	17,966	62,291	6,653
	Cod	205	709	77
	Halibut	18	62	7
	Others	2	7	0.8
	Total	18,191	63,069	6,738
September- December Total	Redfish	19,351	67,165	6,750
	Cod	104	360	36
	Halibut	10	36	4
	Others	5	18	2
	Total	19,470	67,579	6,792

TABLE VI

Icelandic Vessels Taking Part in the Fishery of Redfish
in Subareas 2 and 3 in 1958.

Brutto Reg. Tons	Number of Vessels	Average Br. Reg. Tons	Engine HP	Average Engine HP
450 - 500	1	491	950	950
501 - 550	-	-	-	-
551 - 600	-	-	-	-
601 - 650	3	620.7	1200-1400	1266.7
651 - 700	29	664.4	1000	1000
701 - 750	6	722.3	1000-1332	1110.7
751 - 800	-	-	-	-
801 - 850	2	826.5	1470-1600	1535
Total 27608	41	673.4	43484	1047.1

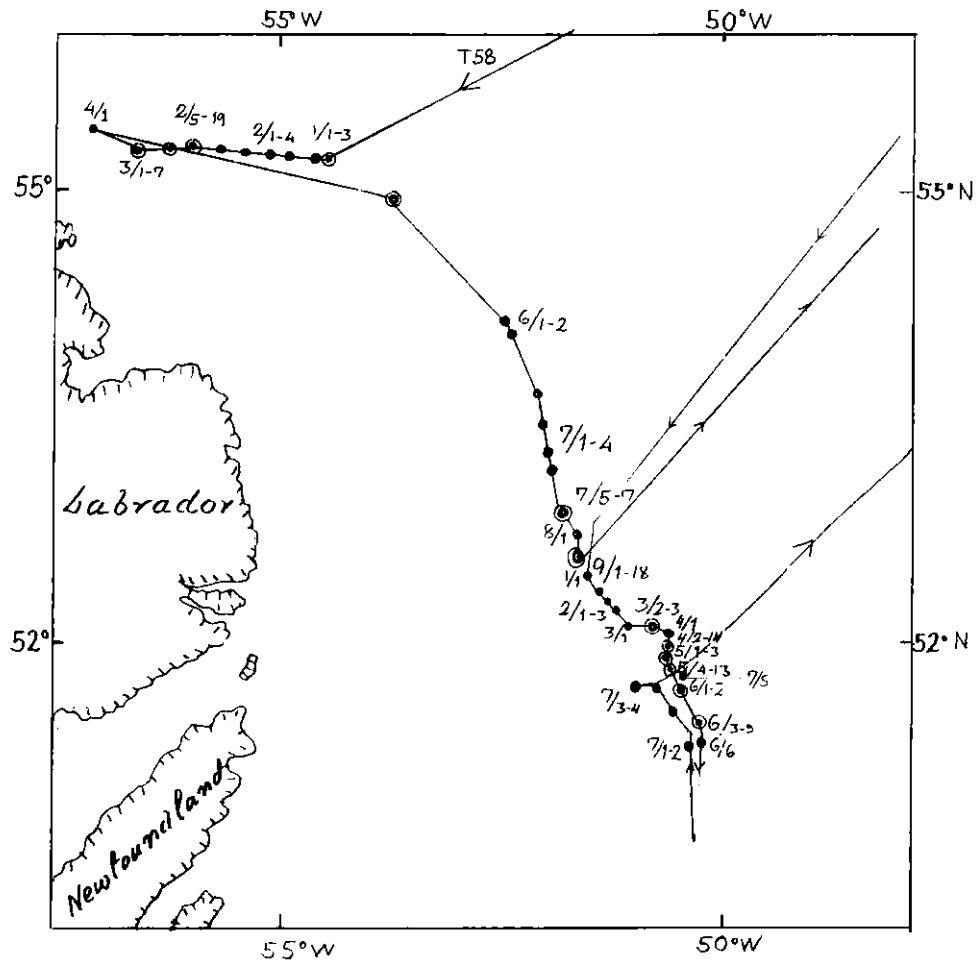


Figure 1: The Location of Trawling Stations on the "Fylkir" Expeditions in 1958. T58: The Cruise in July. U58: The Cruise in September.

● Trawling Stations
⊙ 2 or more Hauls

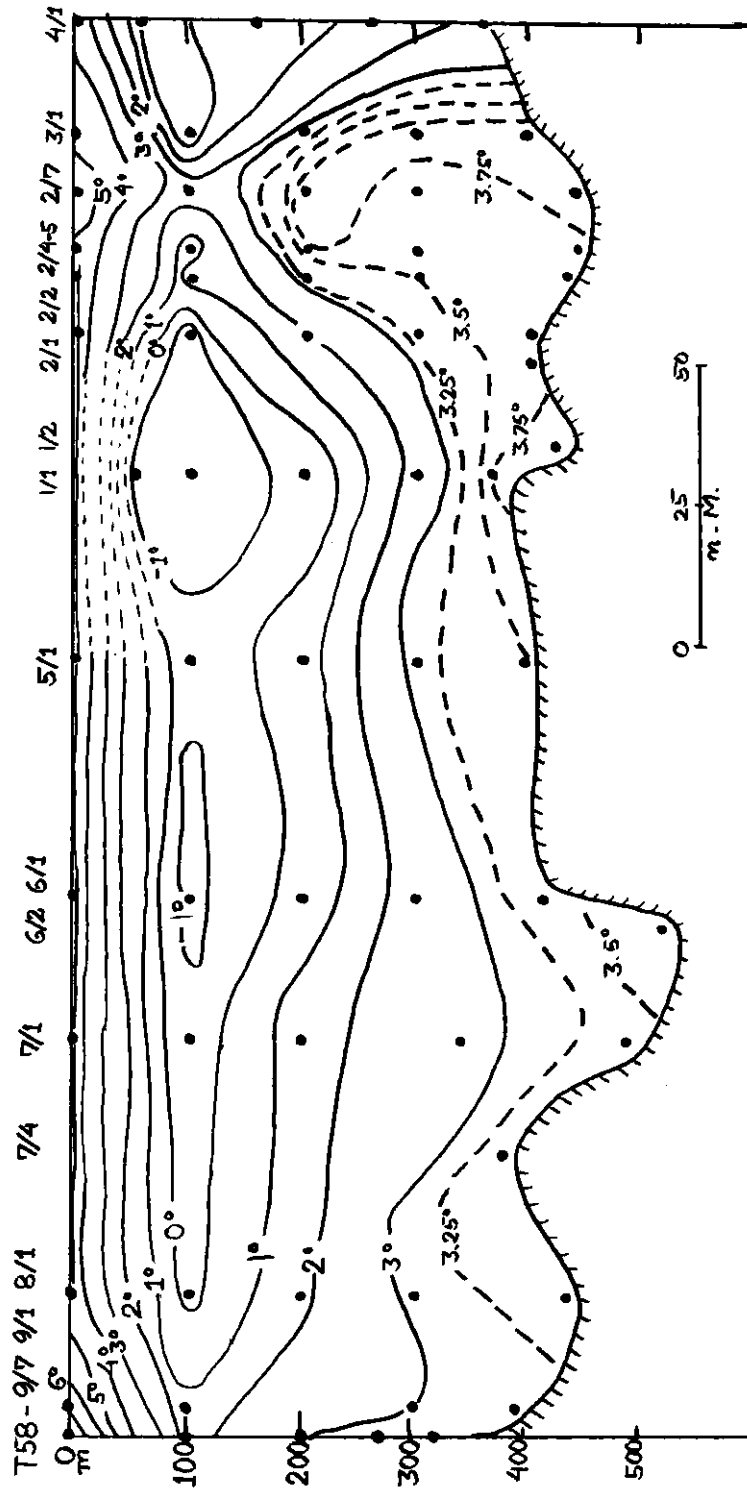


Figure 2: The Distribution of Temperature at the Trawling Stations on the Cruise in July.

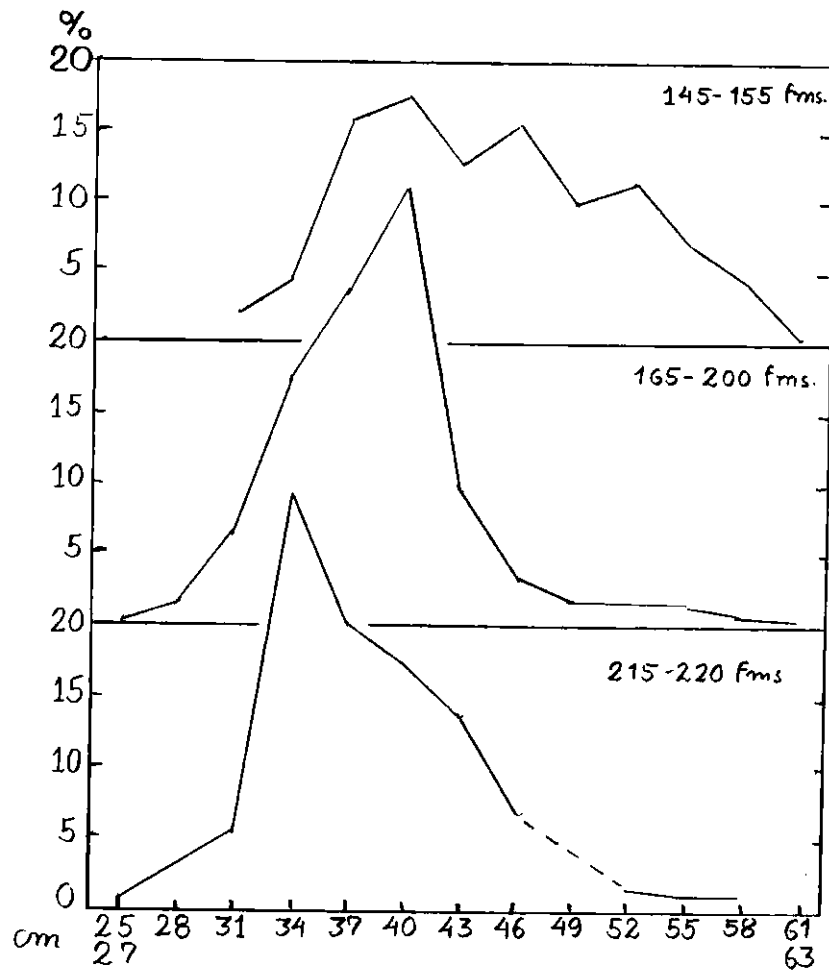


Figure 3: Redfish. Length Distribution for Various Depth Intervals at Sundall (Station T58-9).

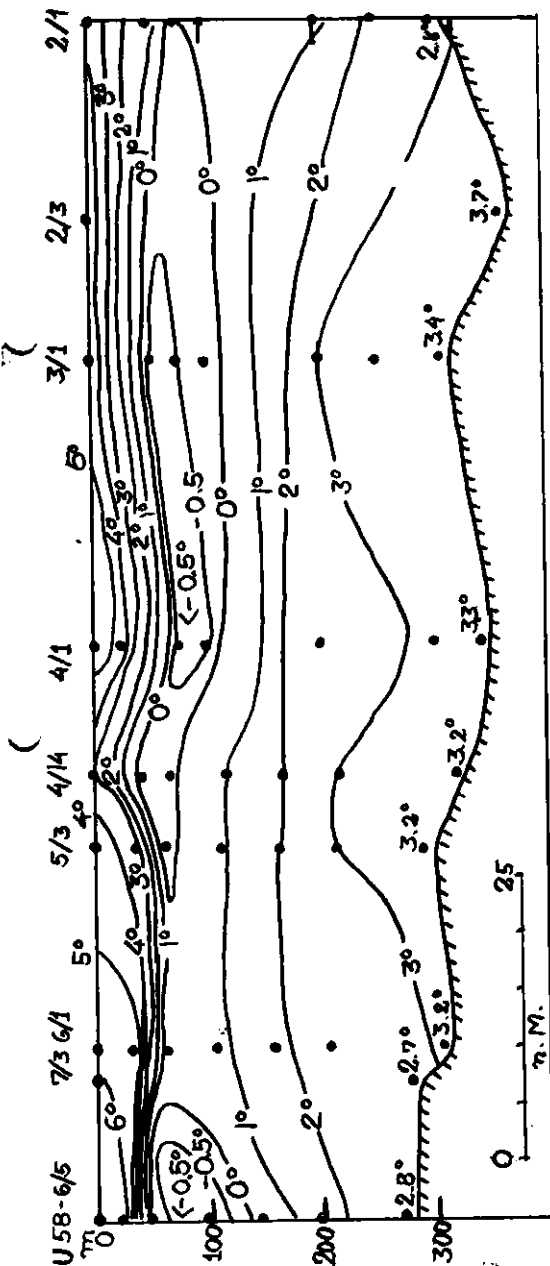


Figure 4: The Distribution of temperature at the Trawling Stations on the Cruise in September (U58).

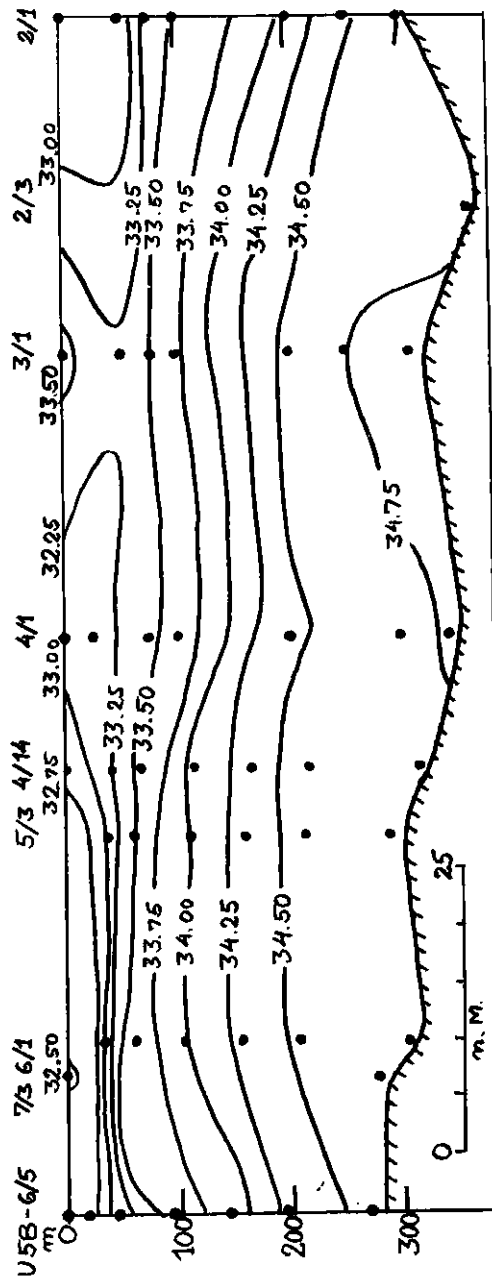


Figure 5: The Distribution of Salinity at the Trawling Stations on the Cruise in September (U58).

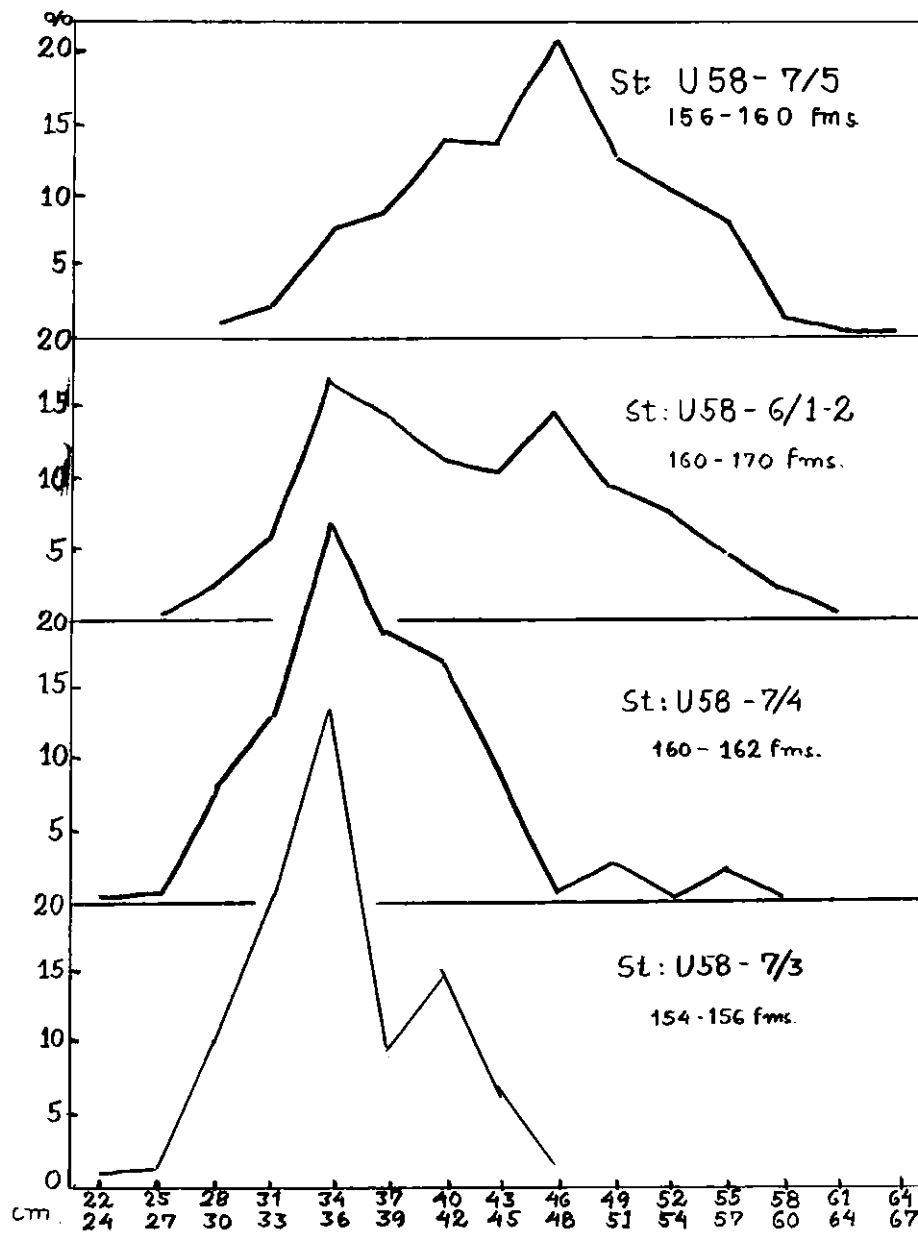


Figure 6: Redfish, Length Distribution for Different Hauls Taken on the Shelf and the Slope at Ritubanki.