

Northwest Atlantic



Fisheries Organization

Serial No. N695

NAFO SCS Doc. 83/VI/15

SCIENTIFIC COUNCIL MEETING - JUNE 1983

France Research Report for 1982

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Subarea 1

1. Status of the Fisheries

In 1982, the French (M) Fishery for northern deepwater shrimp off west Greenland was again conducted by two freezer trawlers from the end of June to mid September. The fishing grounds were located in division 1 B on the northern part of the Store Hellefiske Bank from 67°07 N to 68°00 N ; the depth of trawling ranged from 200 to 360 m and minor differences were observed in the location of the french fishery compare to previous year.

The total catch was close to 660 tons against a total of 556 tons in 1981. From June to August, the catch rate increased from 235 kg/hour to 324 kg/hour and then decreased in September (288 kg/hour) but this figures were lower than those of 1981 : the total cpue from 1982 decreased of 17 % compare to previous year, but it remained at a higher level than in 1980.

2. Special Research studies

a) Shrimp

Biological data on shrimp were obtained in this area from 8 samples frozen on board the trawler "FINLANDE III", and more than 1000 individuals were examined from measurements, sexual determination, maturity stage and age determination.

These observations indicated a lower abundance of male (age group III) in the catch and an abnormally low percentage of maturing females probably due to coldest conditions during spring 1982. This could affect the recruitment to the fishery in 1986 and 1987. However, most of the commercial catches are based on several ages groups and some of them being abundant, the effect on commercial catches rates would not be too important.

b) Cod

A groundfish survey was carried out on board the R/V "THALASSA" off west Greenland in Divisions 1 C, 1 D, 1 E and 1 F from 5 June to 21 June 1982.

i) Hydrographic studies

During the cruise, ice extended in Divisions 1 D, 1 E and 1 F and the sampling of the southern part of the area was difficult.

A total of 72 XBT casts were made. A very cold layer was observed between 30 and 200 m depth with a temperature lower by about 1°C, than the average usually observed in June.

ii) Biological studies

During the research cruise of the R/V "THALASSA", a total of 61 trawling stations (30 minutes duration) were occupied. Cod represented 54 % of the total catch in weight. The largest catches rates were obtained between 300 and 400 m as indicated in the following table.

Strata (m)	No. sets	Catch rates (kg/30 min)
< 99	9	"0"
100-199	15	2
200-299	24	92
300-399	9	574
> 399	4	7
Total	61	122

The best catches were observed on Namortalik Banc (1 069 kg/30 min), Nassarlik Bank (788 kg/30 min) and Fyllas Bank (3 796 kg/30 min).

Length distribution was bimodal, the first mode being observed at 30-33 cm LT and corresponding to the 1979 year class and the second one at 54 cm LT corresponding to the 1977 year class. The 1978 year class appeared to be relatively poor.

As indicated by Danish Oceanographers natural mortality of cod larvae is very high when the temperature of the surface layer does not reach 1°C. This was the case in 1982, and the abundance of the 1982 year class will be probably poor.

Subarea 2

1. Status of the Fisheries

In 1982, catches of cod were reported from the French Fishery (M) in Divisions 2 G H and 2 J.

i) In Divisions 2 G H, the French (M) trawlers operated at a very low effort and catches of 51 tons were reported.

ii) In Division 2 J, a total of 415 tons of cod were reported by the French trawlers (M) and the fishery was conducted during march.

2. Special Research Studies

As in previous years, a research survey was carried out on board the R/V "CRYOS" off Labrador in Division 2 J, in february 1982.

a) Hydrographic studies

From 31 january to 6 february, 27 XBT stations were occupied in Division 2 J, south of 53°30 N because of ice conditions. A very cold layer (0-60 m, 1°5 C to - 1°C) extended from the surface to 60 m depth and a progressive increase in water temperatures occurred from 60 m depth to the bottom. These observations indicated that bottom temperatures were warmer in 1982, compared to 1981.

b) Biological studies

During the stratified random survey of the R/V "CRYOS", a total of 26 trawling stations (30 minutes duration) were occupied southwest of Hamilton Bank. In the catches, cod represented 37 % of the total weight.

The following table indicates that the largest overage catch rates were obtained between 300 and 400 meters, this distribution was very similar to distribution observed in 1981.

Strata (m)	No. sets	Catch rates (Kg/30 min)
201-300	7	488
301-400	8	505
401-500	6	43
501-750	5	4
Total	26	297

However, these figures indicate a very important decrease in research catch rates of cod in this area from 1981 to 1982.

From these research catches, 5 098 cod were sexed and measured. The length distribution showed three modes at 30-33 cm LT, 42 cm LT and 60 cm LT corresponding mostly to the 1979, 1978 and 1975 year classes.

c) Others finfish

Length distribution by sex were also obtained from redfish, grey sole, american plaice and greenland halibut.

Subarea 3

1. Status of the Fisheries

a) Cod

Catches of cod were reported from the French fishery (M and SPM) in Divisions 3 K, 3 L, 3 N, 3 O, 3 Pn and 3 Ps in 1982. No catches were reported from Division 3 M.

i) In Divisions 3 K and 3 L, the French (M) trawlers operated and 674 tons were reported. Catches from French (SP) trawlers were only fishing in Division 3 L and a total of 177 tons were reported. In Divisions 3 N O, the trawlers has caught 37 tons of cod as by-catches in the flatfish fisheries.

ii) In Subdivision 3 Ps, French (M and SP) trawlers reported cod catches of 4 247 and 3 771 tons respectively, and the fishery was mostly conducted in spring and autumn. The inshore dories fishery took place in summer, and its catches increased compared to 1981 (respectively 728 and 333 tons) but the catch-rates were still very low. A nex longline fishery took place in winter and reported cod catches were 281 tons.

b) Squid

Only 32 tons of squid were reported by the inshore French fishery compared to 314 tons in 1981 and 1885 tons in 1980. This decrease was due to very low catches rates.

c) Other finfish

A flatfish fishery occurred in Division 3 N O summer and French (SP) trawlers reported catches of 90 tons for yellowtail flounder, and 42 tons for american plaice.

In Subdivision 3 Ps, yellowtail catches were reported by French (SP) trawlers as a by-catch of the cod fishery in autumn (328 tons) and other finfish were also reported (redfish, haddock, pollock, skates, ...) ; however, in this subdivision, cod catches represented 77 % of the total of the French (SP) trawlers.

2. Special Reserach Studies

As in previous years, research was carried out in subarea 3 and several surveys were conducted on board the R/V "CRYOS" :

- in Divisions 3 K and 3 L in february 1982,
- in Subdivision 3 Ps in february-march and september-november 1982.

a) Hydrographic studies

i) On Ritu Bank (Div. 3 K) 15 hydrographic stations were occupied from 6 to 19 february 1982. The coldest waters were observed on the western part of the Bank (less than - 1°C) ; on the other parts of the Bank, the temperature of the

surface layer (0 - 120 m) ranged from - 0.9 to 0°C ; beneath this layer, water temperatures increased and reached 2°C at 200 m depth. Bottom temperatures averaged 2°C.

ii) Due to the very bad weather conditions, only two hydrographic stations (XBT) were occupied in Div. 3L.

Generally speaking, bottom temperatures observed in Div. 2 J and 3 K L in winter 1982, were higher than in winter 1981 but they were lower than in winter 1980.

iii) In Subdivision 3 Ps, 87 hydrographic stations (XBT) were occupied from 5 march to 3 april and 105 from 25 september to 1 november 1982.

In winter 1982, a thick cold layer (negative temperatures) extended down to 160 m depth. The intermediate layer was only represented by a strong positive thermic gradient which occurred about 200 m depth on the slope of the Saint-Pierre Bank, and about 100 m depth in Laurentien Chanel.

Under these layers, and as usual, the slope water (7°C) was observed between 150 and 300 meters depth and the bottom water (below 5°C) occurred deeper than 400 meters.

Generally speaking, the winter 1982 showed lower temperature compared to the 1981 winter, and some ices were observed on Burgeo Bank and western part of Saint-Pierre Bank in march.

In autumn 1982, temperatures of the surface layer reached 16°C in the Laurentien Chanel ; it was separated of the intermediate layer by a negative thermal gradient near 50 meters.

This intermediate layer was represented by a cold lobe along the slope of the Saint-Pierre Bank between 50 and 180 meters depth and also occurred in the north part of Saint-Pierre Bank and in Halibut Chanel.

Under this layer the slope water (7-8°C) occurred between 200 and 300 meters depth ; beneath the slope water, bottom water (below 5°C) was also observed.

Generally speaking, the bottom temperatures observed in autumn 1982 were lower than those observed in autumn 1981 : on the shelf of Saint-Pierre Bank, the maximum observed in 1982 was 4.6, compared to 6°C in 1981 ; in addition extension of the cold intermediate layer was greater in 1982 than in 1981, particularly in the Halibut Channel.

b) Biological studies

i) Cod

In Div. 3 K, a total of 15 trawling station (30 min duration) were

occupied in february during the stratified random survey of the R/V "CRYOS", but due to dammages to the trawl, only 10 of these stations were used in the calculations.

Cod represented 60 % of the total catch and the largest catch rate was 910 kg/30 min ; the following table showed mean catch-rates observed by strata during this survey.

Strata (m)	No. sets	Catches rates (kg/30 min)
201-300	5	200
301-400	4	215
401-500	1	53
Total	10	191

A total of 1 158 cod were sexed and measured. Length distribution showed 4 modes at 33 cm LT corresponding to the 1979 year class, 42 cm LT corresponding to the 1978 year class, 60 cm LT corresponding to the 1975 year class and 72 cm LT. This analysis indicated that 1978 year class was abundant in the research catch and that the 1979 year class seemed to be a good one.

In Div. 3 L, due to the very bas weather conditions, only 2 trawling stations were occupied, the best catch-rate being 1 220 kg/30 min. Length frequency, analysis in this division indicated the presence of three modes at 30 cm LT, 54 cm LT and 66 cm LT.

In Subdivision 3 Pn, a total of 6 trawling stations were alos occupied during the stratified random survey of the R/V "CRYOS" in february 1982 , one of them with large trawl dammages.

Cod represented 79 % of the total catche. The largest catch-rates (990 and 631 kg/30 min) were observed between 180 and 205 meters depth.

Mean catch-rates observed by strata during this survey are shown in the following table :

Strata (m)	No. sets	Catches rates (kg/30 min)
94-185	3	436
186-278	1	990
279-370	1	30
Total	5	466

A total of 1 522 cod were sexed and measured from research catches in Subdivision 3 Pn.

The length frequency analysis indicated the presence of a mode at 51-54 cm (year class 1976 and 1977).

As in previous years, two stratified research surveys were conducted on board the R/V "CRYOS" during winter and in autumn in Subdivision 3 Ps.

In winter, a total of 79 trawling stations (30 min duration) were occupied in this subdivision.

The higher catch-rates were observed on the southern part of Halibut Channel (5 030 kg/30 min), on the western slope of Saint-Pierre Bank (1 328 kg/30 min) and on Burgeo Bank (791 kg/30 min).

A total of 5 972 cod were sexed and measured and 1 065 pairs of otoliths were sampled.

The distribution of catch-rates are indicated in the following table.

Strata (m)	No. sets	Catches rates (kg/30 min)
0- 55	6	4
56- 92	14	29
93-183	25	125
184-275	18	95
276-366	14	547
367-549	2	47
Total	79	165

Length frequency distributions analysis indicated the presence of two main modes at 19 cm LT and 48 cm LT. Age composition showed that the year classes 1978 and 1980 were abundant but that 1979 was a poor one.

In september and october 1982, 95 trawling stations (30 min duration) were occupied on Saint-Pierre Bank, Burgeo and Green Banks.

The best catches rates were observed on Saint-Pierre Bank shelf (928 kg/30 min) and on the southwestern part of this Bank (645 kg/30 min).

The mean catches rates obtained by strata were as follows :

Strata (m)	No. sets	Catches rates (kg/30 min)
0- 55	8	236
56- 92	19	102
93-183	28	62
184-275	22	34
276-366	16	2
367-549	2	0
Total	95	67

A total of 4 039 cod were sexed and measured and 824 pairs of otoliths were sampled for analysis of age structures.

Length distribution analysis indicated the presence of a main mode at 51 cm LT with a smaller at 27 cm LT.

During the autumn research cruise, 1 496 cod were also tagged for migration studies.

The totality of the results obtained for cod in the Subdivision 3 Ps indicated that the 1978 and 1980 year class are strong and that 1979 is a poor one.

ii) Redfish

During the winter 1982 stratified research survey of the R/V "CRYOS" redfish was observed in abundance in Hermitage Chanel (1 173 kg and 767 kg/30 min) and on the southern slope of Halibut Chanel (379 kg/30 min).

In autumn 1982, the higher catches rates were also observed on the slope of Hermitage Chanel (986 kg/30 min), on southern part of Saint-Pierre Bank (836 and 833 kg/30 min) and on southwestern slope of this Bank (753 kg/30 min).

Length frequency distributions in the research catches of the R/V "CRYOS" indicated that small redfish were very abundant (one mode at 7,5 cm LT in winter and 9,5 cm LT in autumn, one another at 11,5 cm LT in winter and 14,5 cm LT in autumn).

Another mode occurred near 23,5 cm LT.

iii) American plaice

As in previous years, american plaice was observed in the totality of strata surveyed in Subdivision 3 Ps during winter and autumn stratified random surveys of the R/V "CRYOS". During the winter cruise, best catch-rates were obtained between 90 and 180 meters depth, especially on southern part of Saint-Pierre Bank (869 kg/30 min) and Halibut Chanel (785 and 666 kg/30 min).

In autumn, higher catch-rates were observed in Halibut Chanel (401 and 361 kg/30 min) and north of Green Bank (631 kg/30 min).

Length frequency distributions by sex were bimodal, with a mode at 32 cm LT and another at 21 cm LT. Also noted was the scarcity of small individuals less than 20 cm LT.

iv) Witch flounder

During winter and autumn, stratified random surveys of the R/V "CRYOS" in Subdivision 3 Ps, witch flounder was caught on the slopes of the Banks. However, observed catch-rates were relatively low (usually less than 30 kg/30 min).

Length frequency analysis for each sex indicated that most of the research catches were composed of individuals larger than 30 cm LT.

v) Other finfish

During the two research cruises of the R/V "CRYOS" in Subdivision 3 Ps, observations were made on all commercial species including skate, silver hake, haddock, pollock, halibut, yellowtail, anglerfish, ...).

Very high catch-rates in number of small haddock were obtained on the slope of Saint-Pierre Bank (2 182, 1790, 1708 individuals/30 min for highest catch rates in winter).

Length composition for this species indicated the presence of a single mode at 18 cm LT in winter and 28 cm LT in autumn, corresponding to the 1981 year class.

The thorny skate was observed in almost the totality of the sampled strata during the two research cruises of the R/V "CRYOS". The larger catch-rates were obtained on the western slope of the Saint-Pierre Bank.

For the silver hake, the catch-rates were low and the maximum observed was 140 kg/30 min. The decrease of the catches for this species during last years is due to the lack of abundant year class since 1978.

Also noted during these cruises in Subdivision 3 Ps, was the high catch-rates for halibut on the south and southwestern slopes of Saint-Pierre Bank.

vi) Squid

Catch-rates of squid were very low during the full cruise of the R/V "CRYOS" in Subdivision 3 Ps compared to the previous years, and a total of 48 kg only were caught during the survey.

Very low catches were also observed in the inshore french fishery, and only one sample for biological observations was obtained.

vii) Shellfish

As in previous years, studies were conducted on scallops (Placopecten magellanicus and Chlamys islandica) in Subdivision 3 Ps, and 122 standard dredging tows of 10 minutes duration were made during the autumn research survey of the R/V "CRYOS"

The catch-rates of Placopecten were higher on northern part of the Saint-Pierre Bank than on southern part (maximum catch rates respectively 40 and 23 kg/10 min) and the best catch rate observed for Chlamys was 100 kg/10 min.

Biomass estimates and biological data were derived from the results for the two species. Length and age composition analysis for Placopecten indicated that two very abundant year classes (1977 and 1978) made the bulk of the research catches.

Length composition for Chlamys showed 4 main modes (50 mm, 65 mm, 70 mm and 75 mm).

Studies on comparison of the efficiency dredges with different riggings were carried out in order to check the best gear for this fishery.

Subarea 4

1. Status of the Fisheries

a) Cod

In 1982, catches of cod were reported from French fishery (M and SP) in Divisions 4 R and Subdivision 4 Vn.

i) A total of 11 155 and 1 458 tons of cod were reported from French (M) and French (SP) trawlers respectively. As previous years, the fishery mainly occurred during the first three months of the year on the southern part of the Division 4 R.

ii) In Subdivision 4 Vn, French (M) and French (SP) trawlers reported cod catches of 5 639 and 1 930 tons respectively, and the fishery occurred from January to March.

b) Squid

No squid fishery was conducted in Subarea 4 by French trawlers in 1982.

2. Special Research Studies

As in 1981, in 1982 research was carried out in Subarea 4 during two stratified random surveys on board the R/V "CRYOS" :

- in Division 4 R in January,
- in Divisions 4 V, 4 W, 4 X, in August and September.

a) Hydrographic studies

i) From 12 to 23 January, 31 hydrographic stations (XBT) were occupied in the eastern gulf of Saint Lawrence in Division 4 R.

From the surface to 180 m depth water temperatures increased from 1,5°C to 6°C ; beneath this layer, water temperatures remained roughly constant, about 6°C. However, the structure had rapidly changed during the survey and water temperatures tended to become colder.

ii) A total of 116 XBT casts were made during the survey of the R/V "CRYOS" from 18 august to 21 september in Subdivisions 4 V, 4 W and 4 X.

In addition, 4 hydrographic transects (25 stations) were also occupied (temperature and salinity).

There water layers were observed : a surface layer (temperature 10 to 20°C, salinity 30 to 31,5 ‰) down to 30 m depth, a cold intermediate layer (salinity 31,5 to 33,5 ‰) from 30 to 100 m depth and a warmer water layer (temperature 3 to 10°C, salinity 33,5 to 34,5 ‰) along the slope of the shelf and entering in the depression of the Scotian Shelf.

b) Biological studies

i) Cod

A total of 31 trawling stations were occupied in Division 4 R during the stratified random surveys of the R/V "CRYOS" in january 1982, but due to damages to the trawl, only 26 can be use for calculation.

Cod catches represented 76 % of the total catches compared to 61 % on january 1981 and 91 % in january 1980. The higher catch-rates were observed west of Saint George Bay (1 579 kg/30 min) at depth ranging from 133 to 185 m and northwest of Port au Port Peninsula (1 034 kg/30 min) at 297 m depth.

The mean catch-rates by strata were as follows :

Strata (m)	No. sets	Catches rates (kg/30 min)
> 94	5	104
94-185	11	567
186-278	6	293
279-370	4	479
Total	26	401

A total of 8 514 cod were sexed and measured, and 756 pairs of otoliths sampled during this survey for analysis of length and age structures.

Three modes were observed on length frequency distribution of research catches, at 18 cm LT, 27-30 cm LT, 48 cm LT. Age composition indicated that the 1977 year class predominated in these research catches, and that 1975 and 1979 year class were also abundant. On the other hand, 1978 year class appeared to be not very abundant.

ii) Squid

During the stratified random survey of the R/V "CRYOS" in Divisions 4 V, W, X, a total of 116 trawling stations were occupied during the daylight period only. The minimum trawable biomass was calculated and these calculation indicated a very important decrease between 1980, 1981 and 1982 : relative abundance indices were respectively 100, 35 and 3 for these 3 years.

Length frequency in research catches were ranging from 5 to 28 cm ML with probably 4 main modes : a group of small immatures (5 to 11 cm ML), a group of just maturing individuals (11 to 16 cm ML), a group of maturing individuals (15 to 18,5 cm ML) and finally a group of mature squids (18,5 to 25 cm ML).

The same length distribution was observed during previous surveys in 1980 and 1981 ; however large individuals were more abundant during these years.