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France Research Report for 1983

by

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I. SUBAREA 1

A. Status of the fisheries

As in 1982, the French (M) fishery for northern deepwater shrimp off west Greenland was conducted in 1983 by two freezer trawlers. The total catch decreased from 672 tons to 408 tons in 1983, and no catch-rate was available.

B. Special research studies

No biological data was available in 1983 for the deepwater shrimp in this subarea.

II. SUBAREA 3

A. Status of the fisheries

1. Cod

Catches of cod were reported from the French fishery (M and SPM) in Divisions 3N, 3O, 3Pn and 3Ps in 1983.

i) In Divisions 3NO, catches from French (SP) trawlers were 431 tons.

ii) In Subdivision 3Pn, the French (M) trawlers operated and 3,876 tons were reported. Catches from French (SP) trawlers were only 158 tons.

iii) In Subdivision 3Ps, French (M and SP) trawlers reported cod catches of 5,372 and 3,806 tons respectively, the fishery was mostly conducted in spring and autumn. The inshore dories fishery took place in summer, its catches were only 417 tons. The longline fishery took place in winter and spring and reported catches were 255 tons.

2. Other finfish

A flatfish fishery occurred in Division 3NO in summer and autumn and French (SP) trawlers reported catches of 165 tons for yellowtail flounder, and 41 tons for American plaice.

In Subdivision 3Ps, yellowtail catches were reported by French (SP) trawlers as a by-catch of the cod fishery in autumn (159 tons) and other finfish were also reported (redfish, haddock, pollock, skates, ...); however, in this subdivision, cod catches represented 72% of the total of the French (SP) trawlers.

B. Special research studies

As in previous years, research was carried out in Subarea 3 and three surveys were conducted on board the R/V *Cryos*:

- in Subdivision 3Pn in February 1983,
- in Subdivision 3Ps in February-March and October-November 1983.

1. Hydrographic studies

In Subdivision 3Ps, 110 hydrographic stations (XBT) were occupied from 21 February to 19 March and 80 from 7 October to 16 November 1983.

In winter 1983, negative temperatures in the surface cold layer have only been reported in the northern part of Halibut Channel. The intermediate layer was represented by a weak positive thermic gradient which occurred about 160 m depth on the slope of the Saint-Pierre Bank, and about 120 m depth in Laurentian Channel. Under these layers, the slope water (6°C to 7°C) was observed between 160 and 300 meters depth and the bottom water (between 4°C and 5°C) occurred deeper.

No ice has been observed and generally speaking, the winter 1983 showed higher temperature compared to 1982.

As usual, in autumn 1983, temperatures of the surface layer reached 17°C in the Laurentian Channel; it was separated from the intermediate layer by a strong negative thermal gradient near 40 meters. This intermediate layer was represented by a cold lobe along the slope of the Saint-Pierre between 40 and 160 meters depth and also occurred in the northern part of Saint-Pierre Bank and in the Halibut Channel. Under this layer the slope water (6°C-7°C) occurred from 160 m depth.

The surface temperatures observed in autumn 1983 were higher than those observed in autumn 1982 and can be compared to those of 1981: the intermediate layer was colder in 1983 than in 1982 particularly in the northern part of Saint-Pierre Bank.

2. Biological studies

i) Cod

In Subdivision 3Pn, a total of 13 trawling stations were occupied during the stratified-random survey of the R/V *Cryos* in February 1983, three of them with larger trawl damages.

Cod represented only 20% of the total catch. The largest catch-rate (278 kg/30 min) was observed by 250 meters depths. A total of 251 cod were sexed and measured from research catches in Subdivision 3Pn. The length frequency analysis indicated the presence of a mode at 57 cm (year-class 1977).

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

In winter, a total of 106 trawling stations (30 min duration) were occupied in this subdivision.

The higher catch-rates were observed on the southern part of Halibut Channel (548 kg/30 min) and on Burgeo Bank (628 kg/30 min). A total number of 5,711 cod were sexed and measured and 815 pairs of otolithes were sampled.

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

Strata (m)	Nº of sets	Catch rates (kg/30 min)
31 - 55	6	15
56 - 92	20	18
93 -183	32	94
184-275	21	200
276-366	19	73
367-549	8	4
Total	106	86

Length frequency distributions analysis showed the presence of two modes at 19 cm LT and 55-58 cm LT corresponding respectively to 1981 and 1978 year-classes; age composition showed that the year-classes 1980 and 1982 were abundant too.

In October and November 1983, 74 trawling stations (30 min duration) were occuped on Saint-Pierre, Burgeo and Green Banks.

The best catch rates were observed on Saint-Pierre Bank shelf (849 kg/30'). The mean catch rates obtained by strata were as follows:

Strata (m)	Nº of sets	Catches rates (Kg/30 min)
31- 55	7	442
56- 92	17	92
93-183	20	48
184-275	15	21
276-366	8	5
367-549	7	0
Total	74	81

A total number of 5,838 cod were sexed and measured and 594 pairs of otoliths were sampled for analysis of age structure. Length distribution analysis indicated the presence of a main mode at 40 cm LT with two smaller at 58-61 cm LT and 19 cm LT.strong.

The totality of the results obtained for cod in the Subdivison 3Ps in 1983 confirmed the strength of the 1978 and 1980 year-classes and indicated that the 1981 and 1982 year-classes are strong.

ii) Redfish

During the winter 1983 stratified research survey of the R/V *Cryos* redfish was observed in abundance in Hermitage Channel (606 kg/min) and on the southern slope of Halibut Channel (1,056 kg/30 min).

In autumn 1983, similar catch rates were observed on the same strata.

Length frequency distributions in the research catches of the R/V *Cryos* showed the presence of a very important mode at 11 cm LT in winter and two other modes at 16 cm LT and 24 cm LT in autumn.

iii) American plaice

As in previous years, American plaice was observed in the totality of strata surveyed in Subdivision 3Ps during winter and autumn stratified-random surveys of the R/V *Cryos*.

During the winter cruise, best catch-rates were obtained between 100 and 200 meters depth, particularly in Halibut Channel (361 kg/30 min) and on northern part of Saint-Pierre Bank (982 kg/30 min).

In autumn, the highest catch-rates were observed in Halibut Channel (254 kg/30 min) and in the southern part of Saint-Pierre Bank (184 kg/30 min).

Length frequency distributions by sex were bimodal in winter with modes at 23 cm LT and 31 cm LT for males, 23 cm LT and 38 cm LT for females. A single mode was noted during autumn cruise around 22-24 cm LT.

In both cruises, large numbers of small individuals less than 20 cm LT were noted indicating good recruitment rates.

iv) Witch flounder

During winter and autumn, stratified-random surveys of the R/V *Cryos* in Subdivision 3Ps, witch flounder was caught on the slopes of the banks.

The observed catch-rates were very low (generally less than 30 kg/30 min) and length frequency analysis for each sex indicated that most of the research catches were composed of individuals with length between 30 cm LT and 50 cm LT.

v) Other finfish

During the two research cruises of the R/V *Cryos* in Subdivision 3Ps observations were made on all commercial species (including skate, silver hake, haddock, pollock, halibut, yellowtail flounder, angler fish, ...).

Very high catch-rates in numbers of young haddock were obtained during both cruises. Length composition for this species indicated the presence of a single mode at 30 cm LT in winter and 37 cm LT in autumn corresponding to the 1981 year-class.

The thorny skate was observed in the totality of the sampled area except on Burgeo Bank, during the two research cruises of the R/V *Cryos*. The larger catch rates were obtained on the western slope of Saint-Pierre Bank.

For the silver hake, the catch-rates were low and their decreasing year after year is going on according to the lack of abundant year-classes since 1978.

Also noted during the winter cruise in Subdivision 3Ps, was the high catch rates for halibut due to the arrival of young classes.

vi) Squid

Only 16 kg of squid corresponding to 66 individuals have been caught in Subdivision 3Ps during the autumn cruise. These very low catch rates explain that no catch of squid have been reported in the inshore French fishery for 1983.

vii) Shellfish

As in previous years, studies were conducted on scallops (*Placopecten magellanicus* and *Chlamys islandica*) in Subdivision 3Ps. 30 standard dredging tows (10 minutes duration) were made during the winter cruise and 160 tows during the autumn.

The catch-rates of *Placopecten* were higher on the northern part of Saint-Pierre Bank than on the southern part in winter. In autumn the contrary was noticed. A strong decrease of the catch-rates was observed between 1982 and 1983 autumn cruises, particularly on the northern part of Saint-Pierre Bank.

The best catch rate observed for *Chlamys* was 148 kg/10 min in winter and 136 kg/10 min in autumn.

Length and age composition analysis for *Placopecten* indicated that two very abundant year-classes (1977 and 1978) still made the bulk of the research catches.

Length composition for *Chlamys* showed 4 modes in winter (50 mm, 65 mm, 70 mm and 85 mm) and a single one around 80 mm in autumn.

III. SUBAREA 4

A. Status of the fisheries

1. Cod

In 1983, catches of cod were reported from French fishery (M and SP) in Division 4R and Subdivision 4Vn.

i) A total of 6,615 and 1,682 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 in the southern part of the Division 4R.

ii) In Subdivision 4Vn, French (M) and French (SP) trawlers reported cod catches of 5,282 tons and 1,313 tons respectively and the fishery occurred from January to March.

2. Squid

No squid fishery was conducted in Subarea 4 by French trawlers in 1983.

B. Special research studies

In 1983, research was carried out in Subarea 4 during two stratified-random surveys on board the R/V *Cryos*:

- in Division 4R in January,
- in Divisions 4VWX in September.

1. Hydrographic studies

i) From 19 to 31 January, 67 hydrographic stations (XBT) were occupied in the eastern Gulf of St. Lawrence in Division 4R.

It was observed that cold water surface layer (-0.5 to 0°C) down to about 70 meters depth was present in the area. After this depth, water temperatures were increasing progressively with depth.

ii) In September, during the survey of the R/V *Cryos*, 137 XBT casts were made. In addition, 4 hydrographic transects were realized (27 stations with temperature and salinity data).

The usual 3 layers structure was observed:

- a surface layer, down to 30-40 m depth of warm water (temperature 14 to 19°C, salinity 29 to 32°/₀₀),
- an intermediate cold water layer (minimum temperature between 2 and 3°C); the thickness of this layer was reducing from north to south (100 m to 60 m),
- a deep warmer layer (temperature 7 to 8°C, salinity 33 to 34°/₀₀) along the edge of the shelf and occupying the depressions.

2. Biological studies

i) Cod

A total of 59 trawling stations were occupied in Division 4R during the stratified-random survey of the R/V *Cryos* in January 1983, but due to damages to the trawl, only 54 can be used for calculation.

Cod catches represented 55% of the total catches compared to 76% on January 1982 and 61% on January 1981. The higher catch-rates were observed west of St. Georges Bay (1,518 kg/30 min) at 220 m depth, west of Bay of Islands (931 kg/30 min) at depth ranging from 225 m to 270 m and west of Rich Point (876 kg/30 min) at 175 m depth.

The mean catch-rates by strata were as follows:

Strata (m)	No. sets	Catch rates (Kg/30 min)
< 94	6	167
94-185	19	476
186-278	20	406
279-370	7	123
> 370	2	404
Total	54	380

A total of 14,168 cod were sexed and measured and 747 pairs of otoliths sampled during this survey for analysis of length and age structures.

Two modes were observed on length frequency distribution of research catches at 27 cm LT and 51-54 cm LT. The 1977 year-class represented 38% of the total number of individuals caught and the 1978 year-class 18%.

ii) Squid

In Divisions 4VWX the areal expansion method was used to estimate the minimum trawlable biomass. 129 tows distributed in 22 strata were considered. Relative biomass indices, compared to a basis of 100 in 1980, were respectively for the following years: 32, 3 and 9 in 1983 which shows a slight recovery.

In the length frequency distributions the proportion of small animals was lower than in 1982, 15% of males and 11% of females were under 18 cm (mantle length). The general pattern of these distributions looks better like those observed in 1980 and 1981. Nevertheless, the mode of the squid larger than 17 cm was smaller in 1983 than in previous years.

The proportion of sexually mature animals remained in 1983 as low as in 1982. Only 6% of males had reached the stage II in 1983. The corresponding percentage was 9% in 1982, 33% and 44% in 1981 and 1980.