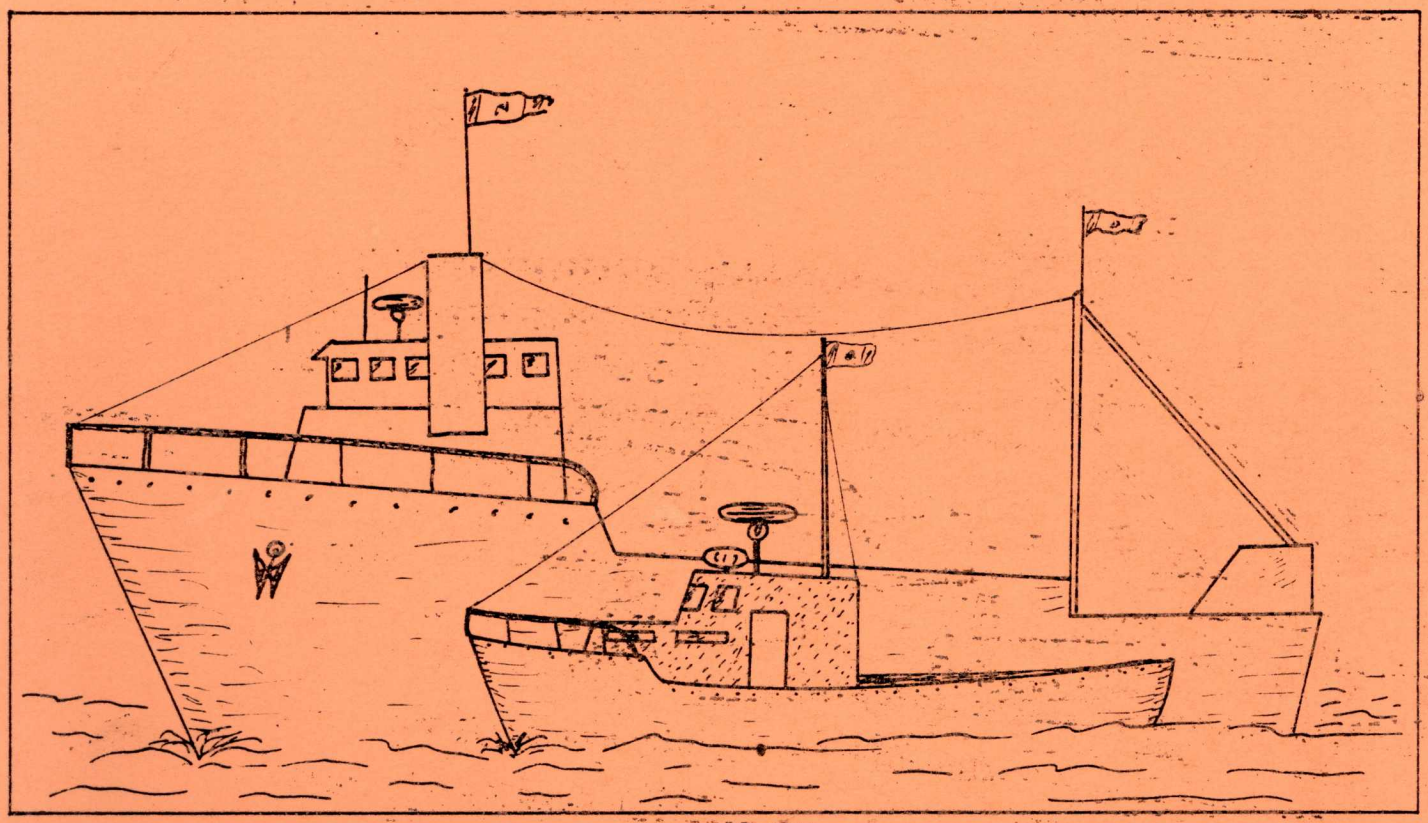
THE MARITIME FISHERIES INDUSTRY OF QUEBEC

STATISTICAL DESCRIPTION



ECONOMIC SERVICES AND DEVELOPMENT BRANCH

QUEBEC REGION

MARCH 1985

Canada

THE MARITIME FISHERIES INDUSTRY OF QUÉBEC — STATISTICAL DESCRIPTION

Economic and Development Services Branch
Department of Fisheries and Oceans
Québec Region

March 1985

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INTRODUCTION

This publication comprises a considerable volume of statistical information on the Quebec maritime fisheries industry from 1977 to 1983 and is indeed the first attempt to compile such extensive data on the subject. This study thus fills a pressing need expressed by those involved in the various areas of activity relating to fisheries. It also links two periods of time, i.e., the one during which the relevant data were gathered by the Quebec Bureau of Statistics (BSQ) and the one during which those data were gathered by the Canadian Department of Fisheries and Oceans.

This publication is the outcome of a major operation aimed at compiling statistical data from various sources. Those data are complemented by brief descriptive analyses. All of the information compiled in the course of this study are presented in four main sections.

In the first section the position of Quebec fisheries is presented in two parts. The first compares the fishing industry to aggregate economic activity in Quebec, while the second evaluates the importance of Quebec fisheries on the Atlantic coast. The second section presents information on the primary sector of the fishing industry (landings, fishermen and fishing fleet). The third section presents the secondary sector through data on the number of processing plants, as well as the output and work force of those establishments. The fourth and final section describes the

marketing of Quebec's fishery products.

The data concerning the primary and secondary sectors are presented from both the provincial and the regional perspectives. The six maritime regions considered as the St. Lawrence, the Northern Gaspé, the Southern Gaspé, the Western North Shore, the Eastern North Shore and the Magdalen Islands.

Seeking to facilitate consultation of the data and make the text easier to read, we have placed most of the tables in the appendix. The same data are included in the text in the form of graphs and bar charts. A summary table ranks each of the study regions relative to Quebec in terms of primary and secondary activity.

This document is intended as an informational tool for the use of all those interested in this industry, e.g., organizations active in the economic sectors concerned, fisherman associations, producers, students, research groups and management.

This study was made possible by the contribution of a great many individuals, including those involved in the Career-Oriented Summer Employment Program (COSEP).

Denis Martin
Director General
Quebec Regional Branch
Department of Fisheries and Oceans

A

POSITION OF THE QUEBEC MARITIME FISHERIES INDUSTRY

p. 5

A - POSITION OF THE QUEBEC MARITIME FISHERIES INDUSTRY

In order to situate the Quebec fishing industry with greated precision, it will first be presented in the overall context of industrial activity in the province and then in terms of its importance relative to aggregate fishing activity on the Atlantic coast of Canada.

1. The fishing industry relative to overall economic activity in Quebec

In its infancy, the Quebec fishery was the driving force of an economy centred on the harvesting of natural resources. It is still today the economic mainspring of a number of towns and villages in the eastern part of the province. However, the intense trade and industrial activity of the major urban centres has diminished the relative importance of fisheries for the province as a whole.

Table 1 indicates the importance of each economic activity in terms of Quebec's gross domestic product. It shows, for one, that the economic input of fishing was minimal (less than 0.1%) in 1982 by comparison with total economic activity. Aggregated data on the gross domestic product of the primary sector (agriculture, forestry, fisheries and mines) show fishing ranking slightly higher (1.6% of primary production in 1982). The fishing industry, nevertheless, advanced apace with overall production in Quebec from 1970 to 1982.

The size of the industry work force is another substantial indicator of the position of the fishing industry in the Quebec economy. It is noted, for instance, that in 1982 close to 10,000 workers were employed in the fishing industry at a given time of the year. Those workers accounted for 0.32% of the labour force and 0.37% of employment (see Table 2). The ranking of the fishery industry in the Quebec labour force remained relatively stable from 1970 to 1982.

2. The Quebec fishing industry relative to the Atlantic coast[1]

The position of the Quebec fishing industry relative to that of the Atlantic coast will be examined from two vantage points. For the primary sector, the relative volume of landings will be considered, whereas for the secondary sector data on marine product processing plants will be analyzed.

Overall, the quantity and value of landings in Quebec accounts for only a small portion of landings and landed value on the Atlantic coast (see Fig. 1). The proportion of landings increased considerably, however, between 1977 and 1982, rising from 5.4% to 7.3%. The proportion of the landed value was also slightly higher, 8.6% of the entire Atlantic coast in 1982 as against 7.1% in 1977.

---

[1] The Atlantic coast comprises the five provinces of eastern Canada, i.e., Prince Edward Island, Newfoundland, Nova Scotia, New Brunswick and Quebec.

A similar observation can be made with regard to the main species landed in Quebec in 1982 (see Fig. 2). Those harvests generally totalled less than 25% of landings on the Atlantic coast, with the exception of shrimp, since extensive stocks of that crustacean occur near the Quebec coastlines (Sept Iles, northern and southern Anticosti).

A distinction should be made between the relative importance of the species occurring along the Atlantic coast on the one hand and in Quebec on the other. For example, cod is the main species landed in Quebec (in quantity and value), while considering the Atlantic coast as a whole, shrimp becomes the main species contributed by Quebec.

FIGURE 1 TOTAL LANDINGS AND LANDED VALUE IN QUEBEC AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE ON THE ATLANTIC COAST, 1977-1982

Percentage

- Quantity
- Value

Year

SOURCES: 1. DFO, Canadian Fisheries: Annual Statistical Review, 1977 to 1981.

2. DFO, Canadian Fisheries: Landings, December 1982.

Fig. 3 allows for comparison of the landed prices of the ten main species
p. 7 in Quebec against the average prices of the same species on the Atlantic coast in 1982. It is observed that for several species the prices obtained

in Quebec exceed those obtained on the Atlantic coast. It is further observed that the species having the highest value are eel and lobster and that the landed value of shellfish is generally higher than that of the other species.

TABLE 1 GROSS DOMESTIC PRODUCT AT FACTOR COST BY ECONOMIC ACTIVITY, PERCENTAGE IMPORTANCE AND VALUE, QUEBEC, 1970, 1977-1982 (IN MILLION CURRENT DOLLARS) p. 6

	1970	1977	1978	1979	1980	1981	1982
	($'000,000)						
1 - Agriculture							
2 - Forestry							
3 - Fishing and trapping							
4 - Mines (incl. milling), quarries and oil wells							
5 - Manufacturing							
6 - Construction							
7 - Transportation							
8 - Storage							
9 - Communication							
10 - Electric power, gas and water utilities							
11 - Wholesale trade							
12 - Retail trade							
13 - Finance, insurance and real estate							

14 - Public administration and defence

15 - Services

16 - TOTAL

SOURCE: BSQ, Comptes économiques des revenus et des dépenses, Quebec, 1961-1982.

TABLE 2 PERCENTAGE IMPORTANCE OF THE FISHING INDUSTRY RELATIVE TO THE LABOUR FORCE AND EMPLOYMENT, QUEBEC, 1970, 1977-1982

Year

Labour force

Number of fishermen

Employment in fish processing plants

Person-years Maximum number

Total

Total

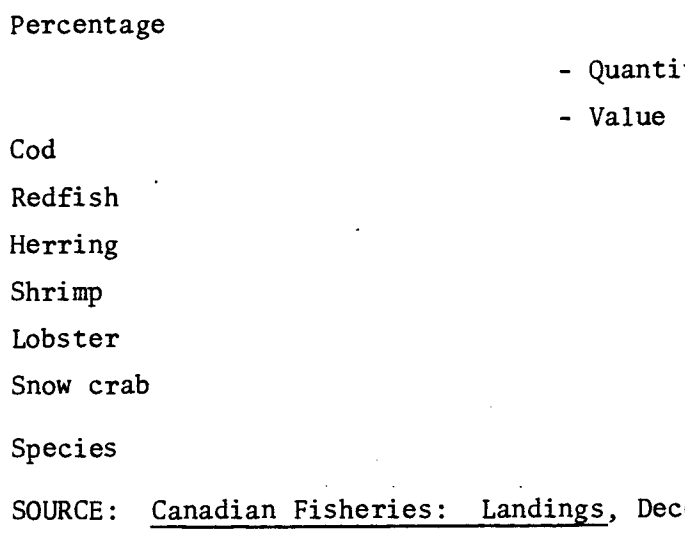
Share (%) of labour force

Share (%) of employment

SOURCES: BSQ, Pêche commerciale, 1970, 1977-1982.
Statistics Canada, Cat. 71-201.

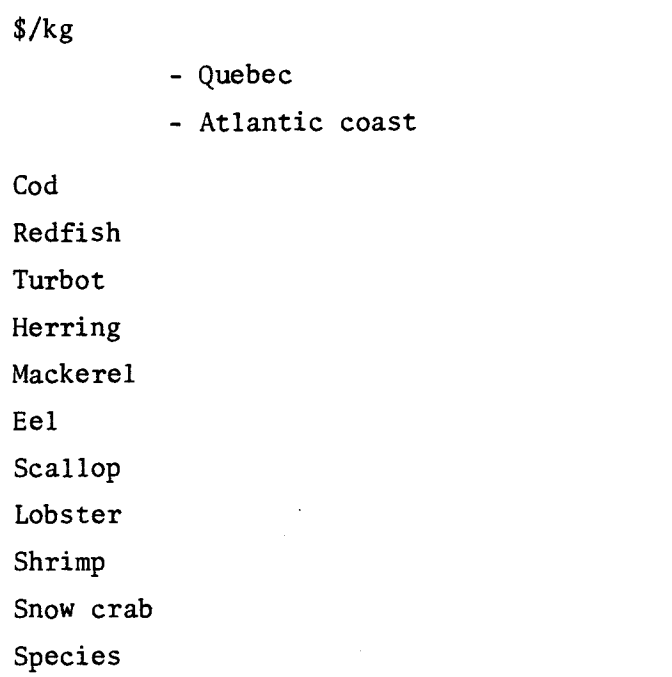
N.B. The size of employment in fish processing plants is a minimum, as not all of those plants are censused by Statistics Canada.

FIGURE 2 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN QUEBEC AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE ON THE ATLANTIC COAST, 1982 p. 7



SOURCE: Canadian Fisheries: Landings, December 1982.

FIGURE 3 LANDED PRICES OF SELECTED SPECIES, QUEBEC AND ATLANTIC COAST, 1982 (IN DOLLARS/KG)



SOURCE: Canadian Fisheries: Landings, December 1982.

p. 7 The differences in landed prices in Quebec and on the Atlantic coast depend on various factors, among them the nature and quality of the species landed and the target markets. For one, the 1981 eel embargo imposed by West Germany sent prices for this species plummeting from $4.60 to $2.22 per kilogram between 1980 and 1982.

The profits of Quebec's fish products industry relative to those of the Atlantic coast as a whole parallel the profile for landings. Indeed, Table 3 shows the proportions of the various parameters varying from 7% to 14%. From 1977 to 1982 the number of establishments in Quebec remained fairly stable compared to that of the Atlantic coast, as did the proportion of plant workers. During that five-year period Quebec plant production, expressed by the total value of shipments, showed much the same results as for the Atlantic coast as a whole, varying from 8% to 10%.

p. 8 TABLE 3 PERCENTAGE IMPORTANCE OF FISH PROCESSING PLANTS, NUMBER OF WORKERS WAGES, TOTAL VALUE ADDED AND TOTAL VALUE OF SHIPMENTS IN QUEBEC AS COMPARED TO THE ATLANTIC COAST, 1970, 1977-1982

	1970	1977	1978	1979	1980	1981	1982
Number of establishments (%)							
Number of production workers (%)							
Wages (%) (production workers)							
Total value added (%)							
Total value of shipments (%)							

SOURCE: Statistics Canada, Catalogue 32-216.

TABLE 4 NUMBER OF ESTABLISHMENTS HAVING FISH PROCESSING AS THEIR PRINCIPAL ACTIVITY ACCORDING TO NUMBER EMPLOYED, QUEBEC AND ATLANTIC COAST, 1981

Size class (number of workers)	Quebec		Atlantic coast	
	Number of establishments	%	Number of establishments	%
0 to 4				
5 to 9				
10 to 19				
20 to 49				
50 to 99				
100 to 199				
200 to 499				
500 to 999				
1,000 and over				
TOTAL				

SOURCE: Statistics Canada, Catalogue 31-203.

N.B. See footnote to Table 2.

Table 4 gives the distribution of plants by number of workers. Quebec compares favourably with the Atlantic coast as a whole. It has 31% of the medium-sized establishments (50 to 500 workers), as compared to 35% for the Atlantic coast.

3. Definition of the six maritime regions of Quebec

One of the chief characteristics of this publication is to draw regional profiles from the various fisheries data. This brief section defines the area covered by each of the six maritime regions of Quebec studied in this document. The regions in question result from aggregation of the 28 maritime districts defined by the Quebec Bureau of Statistics (BSQ). Those districts cover all of eastern Quebec, from Cap Tourmente to Blanc-Sablon on the north shore and from Anse-à-Gilles to the Restigouche River (Chaleur Bay) on the south shore. This aggregation also includes Anticosti Island and the Magdalen Islands. It should be noted that the limits of each of the districts coincides with such topographical features as rivers and capes, with the limits of other territorial divisions, e.g., electoral wards, or with the limits of regions in which specific fisheries are practiced.[1]

St. Lawrence

The St. Lawrence is the only region that embraces both shores of the St. Lawrence River.

It comprises BSQ districts 1, 2, 3 and 16 (see Fig. 4). The area extends from Cap Tourmente to the Saguenay River on the north shore and from Anse-à-Gilles up to, but not including, Sainte-Flavie on the south shore.

---

[1] BSQ, Pêche commerciale, 1981, p. 12.

Northern Gaspé

The Gaspé Peninsula is divided into two areas for the purposes of this analysis. Northern Gaspé comprises BSQ districts 4 through 8 (see Fig. 5). It includes the communities from Sainte-Flavie (near Rimouski) up to, but not including, Cap Gaspé. Major fishing communities, such as Rivière-au-Renard and Matane, are situated in this area.

Southern Gaspé p. 9

The Southern Gaspé region covers the rest of the Gaspé Peninsula. It extends from Cap Gaspé to the Restigouche River and comprises BSQ districts 9 to 15 (see Fig. 6). Gaspé, Percé and Newport are a few of the communities in this area.

Western North Shore

For the purposes of this study, the North Shore is divided into two regions. The Western North Shore comprises BSQ districts 17 to 20 and 25 (see Fig. 7) and covers the area between Tadoussac and Havre-Saint-Pierre (excluded). It also includes Anticosti Island, where a number of fishing communities are found. The towns of Baie Comeau and Sept Iles form part of this region.

Eastern North Shore

The Eastern North Shore corresponds to the region known as the Lower North Shore

and comprises the municipalities between Havre-Saint-Pierre and Blanc-Sablon. It covers BSQ districts 21 to 24 (see Fig. 8). Major fishing areas, such as La Tabatière and Blanc-Sablon, are found in the Eastern North Shore.

Magdalen Islands

Situated in the middle of the Gulf of St. Lawrence, the Magdalen Islands region covers BSQ districts 26 to 28 (see Fig. 9) and includes towns and villages such as Havre-aux-Maisons, Havre-Aubert and Cap-aux-Meules.

FIGURE 4 ST. LAWRENCE REGION

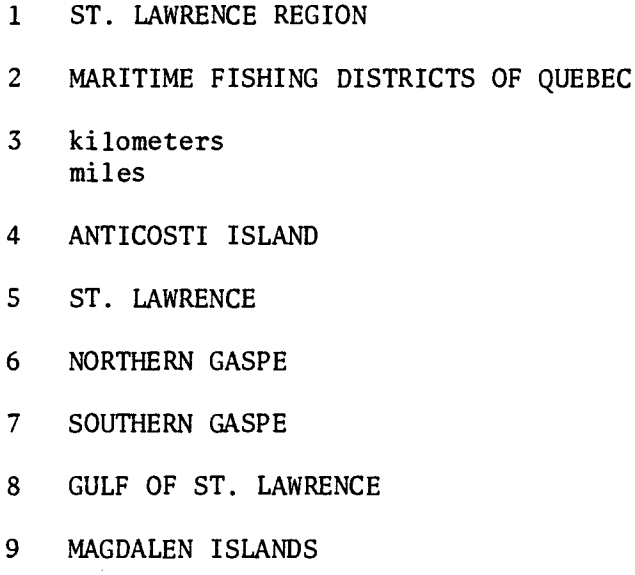


FIGURE 5 NORTHERN GASPE REGION

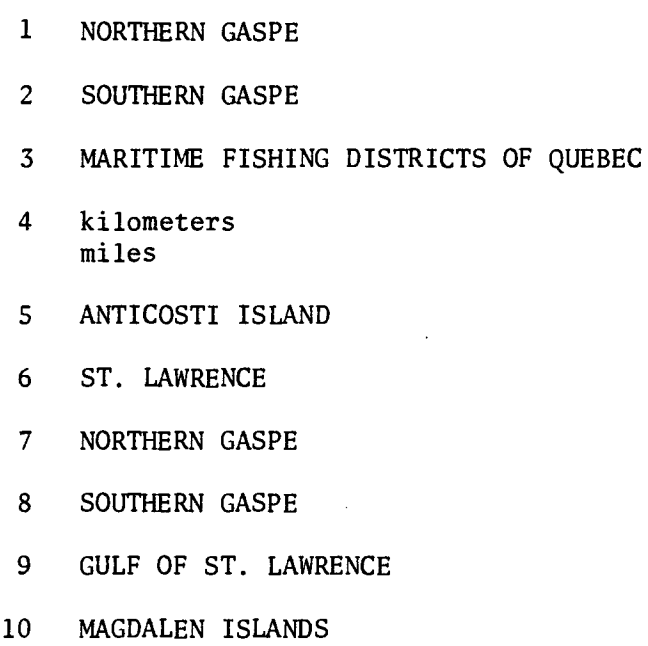


FIGURE 6 SOUTHERN GASPE REGION

1 SOUTHERN GASPE

2 SOUTHERN GASPE

3 MARITIME FISHING DISTRICTS OF QUEBEC

4 kilometers
miles

5 ANTICOSTI ISLAND

6 ST. LAWRENCE

7 NORTHERN GASPE

8 SOUTHERN GASPE

9 GULF OF ST. LAWRENCE

10 MAGDALEN ISLANDS

FIGURE 7 WESTERN NORTH SHORE REGION

1 WESTERN NORTH SHORE

2 MARITIME FISHING DISTRICTS OF QUEBEC

3 kilometers
miles

4 ST. LAWRENCE

5 NORTHERN GASPE

6 SOUTHERN HASPE

7 GULF OF ST. LAWRENCE

8 MAGDALEN ISLANDS

9 ANTICOSTI ISLAND

FIGURE 8 EASTERN NORTH SHORE REGION

1 EASTERN NORTH SHORE

2 MARITIME FISHING DISTRICTS OF QUEBEC

3 kilometers
miles

4 ANTICOSTI ISLAND

5 ST. LAWRENCE

6 NORTHERN GASPE

7 SOUTHERN GASPE

8 GULF OF ST. LAWRENCE

9 MAGDALEN ISLANDS

FIGURE 9 MAGDALEN ISLANDS

1 MAGDALEN ISLANDS

2 MARITIME FISHING DISTRICTS OF QUEBEC

3 kilometers
miles

4 ANTICOSTI ISLAND

5 ST. LAWRENCE

6 NORTHERN GASPE

7 SOUTHERN GASPE

8 GULF OF ST. LAWRENCE

9 MAGDALEN ISLANDS

B

PRIMARY SECTOR

B - PRIMARY SECTOR p. 15

1. Fisheries Resources[1]

This section is an overview of the main fish species harvested in the Quebec fisheries industry and provides information on the description and distribution, fishing methods and commercial utilization of each of the 18 species selected for study.[2]

The study species are grouped in four classes: groundfish, molluscs and crustaceans, pelagic fish and the harp seal.

Figures 10, 11 and 124 to 136 illustrate the chief fishing areas in the gulf and estuary of the St. Lawrence River, as well as the fishing methods and gear used in those areas.

---

[1] Much of the information in this section was taken from the factsheet series titled Underwater World, cited in the references.

[2] In 1983 total landings or landed value of the study species in each of the six regions accounted for 95% or more of total landings or landed value of all species harvested in those regions.

FIGURE 10 BOUNDARIES OF THE NAFO FISHING DIVISIONS

QUEBEC

SECTOR

GULF

NEWFOUNDLAND

SCOTIA-FUNDY

NAFO AREA

4RST - 3 Pn

0,2,3,K,LPs

4 VWX, 5

ATLANTIC OCEAN

LABRADOR

POINTE DES MONTS

NEW BRUNSWICK

P.E.I.

NEWFOUNDLAND

NOVA SCOTIA

FIGURE 11 THE LAURENTIAN CHANNEL p. 16

QUEBEC
BAIE COMEAU
MATANE
TADOUSSAC
TROIS-PISTOLES

QUEBEC
ESQUIMAN CHANNEL
NEWFOUNDLAND
P.E.I.
NEW BRUNSWICK
NOVA SCOTIA
U.S.A.

(A) GROUNDFISH

The various groundfish species form a major economic group. In 1983 they accounted for close to 65% of the quantity and upwards of one-third of the value of all landings in Quebec.[1] The group derives its name from the fact that the component species spend most of their adult life near the bottom or "ground" of the sea. Each species of groundfish has its own specific geographical distribution, which varies with water salinity, depth and temperature, feeding areas and spawning period.

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[1] See Table A.10.

The main species in order of landings are: cod, redfish, sole (American plaice, witch flounder and winter flounder), Greenland halibut (turbot) and Atlantic halibut.

An Atlantic groundfish management plan was first introduced in 1976 to
p. 17 divide exploitation of the resource more equitably and effect the reconstitution and conservation of existing stocks.[1]

Atlantic Cod

A. Description and Distribution

Common names: Cod, codfish, common cod

Scientific name: Gadus morhua

French names: Morue franche, morue

Cod are the major groundfish harvested in eastern Canada and the leading species fished in Quebec in terms of quantity. They average 2 to 3 kg in weight and 60 to 70 cm in length. Cod belong to the Gadidae family, which also includes pollock and haddock, species which are scarce in Quebec and constitute only minor fisheries. They do, however, have considerable economic value in the Atlantic provinces. Two major cod stocks occur in the Gulf of St. Lawrence on either side of the Laurentian Channel.

---

[1] Atlantic Groundfish Management Plan 1984, Department of Fisheries and Oceans.

- One stock is concentrated in the northern and eastern Gulf of St. Lawrence, in divisions and subareas 4RS-3Pn of the Northwest Atlantic Fisheries Organization (NAFO) (see Fig. 10).

- The other stock occurs in the southwest Gulf, in NAFO divisions 4T and 4Vn.

The cod stocks undergo extensive migrations inshore from May to September and then move back out to sea in autumn.

B. Fishing Methods

Inshore fishermen harvest cod with handlines, gillnets and longlines; cod traps are used as well along the Lower North Shore. Offshore fishermen make use of basket nets to land cod as the principal or secondary fishery.

C. Utilization

Cod are marketed in several forms. In Quebec they are sold round (whole), salted, dried, filleted or frozen.

Redfish

A. Description and Distribution

Common names: Ocean perch, rosefish

Scientific names: Sebastes marinus, Sebastes mentella, Sebastes faciatus

French name: Sébaste

Redfish range in length from 20 to 41 cm and average weight is about 0.5 kg. The minimum commercial size is about 25 cm. Redfish occur in the deep waters (100-700 m) along major fishing banks. In the Gulf of St. Lawrence, this species is concentrated on the steep slopes of the Laurentian Channel. In Quebec redfish are harvested mainly in the eastern Gulf of St. Lawrence, in NAFO divisions 4R and 4S.

B. Fishing Methods

In Quebec redfish are caught mainly in the Magdalen Islands by large trawlers.[2] Redfish landings in the other regions are by-catches from the shrimp fishery.

C. Utilization

Redfish became commercially important around 1935 as a result of technological advances in filleting and fast freezing. Today, the bulk of the redfish catch goes to market as fresh or frozen fillets. Part of the catch is frozen in blocks, round or dressed (eviscerated and head-off). This groundfish is also used in prepared and semi-prepared dishes.

Greenland Turbot

A. Description and Distribution

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[2] See Table A.10.

Common names: Greenland halibut, black or blue halibut

Scientific name: Reinhardtius hippoglossoides

French name: Flétan du Groenland

Greenland turbot reach a maximum weight of 25 kg and measure about 120 cm. p. 18 The average weight in the commercial catch ranges from 4.5 to 11.5 kg. Optimum water temperature for this species ranges from 1^{o} to 3^{o}C. In the Gulf, the main stocks occur at a depth of about 300 m.

Greenland turbot are concentrated in the northeastern Gulf of St. Lawrence, around Anticosti Island and west of Newfoundland. Mature individuals concentrate and spawn in winter in the Laurentian Channel off Newfoundland. The young fish then move to nurseries on the north shore of Anticosti Island where small shellfish provide plentiful food.

B. Fishing Methods

Young turbot are frequently taken as a by-catch by shrimp trawlers at depths of 200 to 400 metres near the bottom. In Quebec most turbot are taken by inshore fishermen using longlines or gillnets.

C. Utilization

The 1981 turbot catch was marketed mainly as whole fish or fresh or frozen fillets. As its meat is easily processed, producers use turbot to make fish sticks and semi-prepared portions.

Plaice

A. Description and Distribution

American Plaice

Common names: Canadian plaice, plaice, dab, flounder, sole

Scientific name: *Hippoglossoides platessoides*

French name: Plie canadienne

Witch Flounder

Common names: Pole flounder, gray sole, Craig fluke, flet

Scientific name: *Glyptocephalus cynoglossus*

French name: Plie grise

Winter Flounder

Common names: Blackback, sole, flounder, dab, lemon sole, Georges Bank flounder

French name: Plie rouge

These three species are grouped here given that they are usually landed and marketed under the generic name of sole.

The species in this group are relatively slow-growing fish and cannot be harvested for commercial use until they are about 10 years old.

The size that winter flounder attain at any particular age varies with locality, which is related to various environmental factors. In the Bay of Fundy, they are about 25 cm long and on the east coast of Newfoundland, they are about 20 cm long. Winter flounder rarely weigh more than 1.4 kg. They normally inhabit the coastal regions; they live in shallow, warmer waters and can tolerate low salinities. In summer, winter flounder are concentrated in most of the coastal bays, particularly along the North Shore.

Witch flounder and American plaice are found especially in the eastern Gulf of St. Lawrence, between Anticosti Island and Newfoundland. Witch flounder average 45 cm in length and weigh about 0.7 kg. American plaice range in length from 38 to 40 cm and weigh from 0.9 to 1.4 kg.

In 1982 quotas on American plaice applied solely to the southern Gulf of St. Lawrence, NAFO division 4T (see Fig. 10). Quotas on witch flounder applied to the northern Gulf, NAFO divisions 4R and 4S.[1]

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[1] Atlantic Groundfish Management Plan 1984, Department of Fisheries and Oceans, p. 10.

B. Fishing Methods

These three species may be a by-catch fishery of offshore otter trawl fisheries for groundfish and shrimp. They are caught with fixed gear, such as gillnets; longlines and handlines are also efficient gear for this fishery.

C. Utilization

All of these species are filleted, and the bulk of the catch is sold frozen.
p. 19 Fresh fillets of sole are among the most plentiful sea products available in fish stores and the most in demand among Quebec consumers.

Atlantic Halibut

A. Description and Distribution

Common name: Halibut

Scientific name: Hippoglossus hippoglossus

French name: Flétan de l'Atlantique

Atlantic halibut are the largest members of the flatfish family, growing up to 300 kg and 2.5 m long. In the commercial catch, however, their weight range is from 2.3 to 56 kg. Halibut are fairly sedentary groundfish and dwell in deep waters where temperatures are variable and fairly high (1.6^{o}

to 11°C).[1] Year-round fishing of this species is possible in the Gulf of St. Lawrence when ice conditions permit. The halibut fishery takes place mostly in April and May on the south side of the estuary.

B. Fishing Methods

In Quebec halibut are a coastal fishery for the most part. The fixed gear used are: longlines, handlines and gillnets.[2] Halibut landings are often a by-catch from trawl fisheries. There is no management strategy for the halibut fishery.

C. Utilization

Atlantic halibut are marketed fresh or frozen, whole or as steaks or fillets. In 1981 the entire Quebec catch was sold round.

(B) MOLLUSCS AND CRUSTACEANS

The mollusc and crustacean group forms the second largest fishery in Quebec in terms of landings and the first in terms of commercial value. In 1983 it accounted for slightly more than 25% of the quantity and about 61% of the value of all landings in Quebec.[3] In order of landed quantities in 1983, the

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[1] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 17.

[2] Ibid.

[3] See Table A.10.

species in this group are: crab, shrimp, lobster, scallop, whelk and clam.

Snow Crab

A. Description and Distribution

Common names: Queen crab, crab, spider crab

Scientific name: Chionoecetes opilio

French name: Crabe des neiges

The average size crab in the commercial catch weighs 0.5 to 1.35 kg and the shell width may attain 9.5 to 16.5 cm. In keeping with management strategy, only male crabs are harvested; fishermen throw back female crabs, which, size being equal, have smaller legs and claws. In addition, females never reach the commercially acceptable minimum size.

Snow crabs live most commonly on the muddy or sandy bottoms at average depths (70 to 140 m in the Gulf of St. Lawrence) where the water temperature ranges from -0.5° to 4.5°C. They occur in the northwest Atlantic from Greenland down the Canadian Atlantic coast and into the Gulf of Maine, off Labrador and Newfoundland and in the Gulf of St. Lawrence. Although year-round fishing is permitted in the Gulf, most snow crab landings there occur between May and September. The snow crab fishery sometimes extends from April to November.

In the estuary of the Gulf, snow crabs occur mainly north of the Laurentian Channel.

B. Fishing Methods

Gulf fishermen use mainly large rectagular traps (1.8 m x 1.8 m x 0.9 m) with two entrances placed on opposite sides. Some use Japanese conical traps (see Fig. 108).

C. Utilization

Crabs are sold mainly as frozen or canned meat. In season they are also available fresh (meat or whole). Since 1982 crab in sections have been in demand, mostly on the Japanese market.

Pink Shrimp p. 20

A. Description and Distribution

Common names: Northern pink shrimp, great northern prawn

Scientific name: Pandalus borealis

French name: Crevette nordique

Pink shrimp are small, spindly, long-bodied animals of pale scarlet colouring, like that of lobster. This crustacean averages 7.4 to 10 cm long.[1] It takes

[1] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 7.

approximately 4.1 kg of whole shrimp to make one kg of shrimp meat.

Commercial size shrimp are found at depths of 185 to 300 m, near clayey bottoms rich in organic carbon where the water temperature ranges from 2° to 5°C and the salinity is about 34°/oo.[2] During the day the shrimp presumably dwell at less than 5 m from the bottom, while at night they move upward in the water column.

The Canadian shrimp fishery takes place mainly in the northern Gulf of St. Lawrence on the Scotian Shelf and off the Labrador coast. In Quebec it takes place from April to November off Anticosti Island and along the North Shore between Pointes-des-Monts and the Sheldrake River.

B. Fishing Methods

In Quebec vessels participating in the shrimp fishery use small-meshed otter trawls (see Fig. 99). Shrimp boats use different types of trawls depending on their characteristics and the nature of the bottoms harvested. Since 1970 the commercial shrimp fishery has greatly expanded,[3] with the number of vessels rising from 36 (133 fishermen) in 1977 to 45 (160 fishermen) in 1981.[4]

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[2] Ibid., p. 7

[3] See Table A.5.

[4] BSQ, La pêche de la crevette au Québec, 1977-1981, p. 7.

C. Utilization

Quebec shrimp are marketed as cooked and pealed meat. This crustacean is also sold fresh or frozen, individually fast frozen or in cans.

American Lobster

A. Description and Distribution

Common name: Lobster

Scientific name: Homarus americanus

French name: Homard d'Amérique

The lobster is a highly prized shellfish. Lobsters in the commercial catch generally range from 18 to 30 cm in length and weigh from 0.23 to 0.91 kg. Giant lobsters may exceed 20 kg.

Lobsters are found all along the North American coast and prefer rocky bottoms. Canada's commercial lobster fishery began before 1870. The two major lobster fishing areas in Quebec are located south of the Gaspé Peninsula (from Pointe-Gaspé) and in the Magdalen Islands. More than half of Quebec's lobster catch is landed in this archipelago.[5] The lobster fishing season lasts about two months between May and July.

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[5] See Table A.22.

B. Fishing Methods

The Quebec lobster fishery is confined entirely to inland waters. Fishermen use small boats equipped with wooden-frame traps or pots which are baited with herring, mackerel or small flatfish, weighted and lowered to the sea bottom. The traps are hauled by ropes attached to buoys that mark their location.

C. Utilisation

Lobster goes to market in various forms. Large lobsters are almost always sold live. Average and smaller sizes are channeled to freezing and canning plants.

p. 21 Sea Scallop

A. Description and Distribution

Common names: Giant scallop, smooth scallop

Scientific names: Placopecten magellanicus, Chlamys islandica

French names: Pétoncle géant, pétoncle d'Islande

Sea scallops are bivalves. The shell size in the commercial catch ranges from 10 to 12 cm in diameter. The other species on the east coast of Canada is the smaller Iceland scallop.

Iceland scallops prefer colder, deeper waters than sea scallops. When conditions are favourable (temperature, firm ocean floor and abundant food supply), scallops occur in large dense populations called "beds."

The sea scallop is the mollusc with the greatest economic value in Canada. Since the available stocks are limited, the scallop fishery is restricted in Quebec. In 1982 scallop landings in the province accounted for 1.2% of the value of the mollusc and crustacean group, whereas they were valued at more than 25.6% on the Atlantic coast.[1]

One of the main scallop beds in the Gulf of St. Lawrence lies southwest of the Magdalen Islands. Other stocks are harvested along the North Shore, off Anticosti Island and south of the Gaspé Peninsula. Iceland scallops occur on the North Shore since they favour colder waters.

B. Fishing Methods

Fishermen harvesting inland sea scallops use 18-metre long vessels that tow drags equipped with large wire-mesh bags over the ocean bottom (see Fig. 109). Offshore fishermen use more powerful vessels about 30 metres long.

C. Utilization

Scallops are shelled or "shucked" as soon as they are caught and are

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[1] Canadian Fisheries: Landings, December 1982, Vol 4, No 12 (1982 preliminary data), pp. 4 and 6.

marketed fresh or frozen. The large muscle that opens and closes the shells is the only part of the sea scallop sold and eaten in Canada. This edible part, which remains attached to the upper valve, is cut off and retained; the shells and other tissues are discarded. As there is no danger of toxicity in scallops landed in the Magdalens, they could be sold with the roe (female gonad).

Whelk[2]

A. Description and Distribution

Common names: Common whelk, rough

Scientific name: Buccinum undatum

French name: Buccin

Whelks occur all along the coasts of the St. Lawrence estuary, except upstream from Baie St-Paul on the north shore and Notre-Dame-du-Portage on the south shore. They are concentrated on all types of bottoms to depths of more than 30 m.

B. Fishing Methods

Whelks are traditionally harvested with baited traps (see Fig. 107). The

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[2] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 5.

fishing effort is concentrated in Matane and Sainte-Anne-des-Monts on the south shore and Godbout on the north shore.

C. Utilization

Whelks in the commercial catch average 6 cm long and are marketed shelled or cured.

Soft-shell Clam p. 22

A. Description and Distribution

Common names: Clam, soft clam, squirt clam, steamer, gaper

Scientific name: Mya arenaria

French name: Mye commune

Like scallops, soft-shell clams are bivalves. The life cycle of the clam is marked by different stages; in the adult the shell becomes chalky white. The average harvested size of the soft-shell clam is about 5 cm, although this shellfish can grow to 8 to 15 cm.

Although the clam flat locations have been identified, commercial and recreational exploitation is hampered by two major problems: toxicity caused by a small microscopic plankter called Gonyaulax tamarensis, and pollution. With the exception of the Magdalen Islands most clam-producing areas

are closed to harvesting off and on because of toxicity, while certain areas are permanently closed because of pollution.

Like other species of molluscan shellfish that pose a hazard, some examples being razor clams, blue mussels and whelks, soft-shell clams are affected in the contaminated and toxic sectors identified by the federal government.

B. Fishing Methods

The most widespread method of harvesting clams is with hoes or hacks. The bulk of the catch is made from February to June.

C. Utilization

Soft-shell clams in the commercial catch are about 6 to 8 years old and measure 5 cm. They are marketed for human consumption and occasionally as groundfish bait. Since 1966 no landings have been reported on the south side of the estuary.

(C) PELAGIC FISH

Unlike groundfish, which feed and dwell near the ocean bottom, pelagic fish inhabit mainly the surface waters. Certain families of pelagic fish, such as Clupeidae (including herring) and Osmeridae (including smelt and capelin) travel in large schools. These fish manoeuvre in close formation, darting with split-second timing in the quest for

plankton and other small organisms.

In 1983 pelagic fish accounted for 7.8% of all landings in Quebec and 4.4% of the landed value.[1]

Herring are the best known of the pelagic fish and the ones most heavily exploited in Quebec waters. In order of Quebec landings in 1983, the pelagic species with the greatest economic value were: herring, blue mackerel, American smelt, capelin and Atlantic salmon. Despite their marginal commercial value as compared to total landings in the province, the pelagic species are basic to a balanced marine environment. Indeed, many marketable species feed on capelin and sand eel.

Atlantic Herring

A. Description and Distribution

Common names: Herring, sea herring, sardine

Scientific name: Clupea harengus harengus

French name: Hareng de l'Atlantique

Atlantic herring occur in the St. Lawrence estuary, downstream from Kamouraska on the south shore and from Ile aux Coudres on the north shore. Herring may attain a length of 43 cm and a weight of 0.68 kg. However, the

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[1] See Table A.10.

average-sized herring in the catch weigh about 0.23 kg.

Every spring, in May, large schools of mature herring migrate to inshore waters to spawn between Cacouna and Trois-Pistoles. The various herring stocks spend two annual spawning periods in the Gulf of St. Lawrence, the first in spring and the second in autumn.

Herring are fished in all the maritime regions of Quebec. The stock that spawns near Isle Verte is one of the populations censused in the Gulf of St. Lawrence. Tagging data indicate that Isle Verte herring migrate to the Gulf after spawning. This particular population summers on the north shore of the Gaspé Peninsula. In autumn some fish migrate to the mouth of
p. 23 Chaleur Bay. The other populations in Quebec waters occur on the North Shore, in the Magdalens, off the west coast of Newfoundland and in the south of the Gaspé Peninsula.[1]

B. Fishing Methods

Herring in the St. Lawrence estuary are fished with weirs and gillnets. Quebec's herring fishery is essentially an inshore fishery. During the spring spawning period, the most widely used gear in Chaleur Bay and the Magdalens is the gillnet (fixed or drift). Some Gulf fishermen use purse seines as the main fishing gear during the autumn spawn.

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[1] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 10.

C. Utilization

In Quebec herring are sold mainly as fresh whole fish. Export markets are supplied with herring in various forms: frozen (whole, ordinary fillets and steaks), cured fillets and pickled (whole, dressed and filleted). Herring roe is also harvested commercially. Much of the herring catch is used as bait.

Atlantic Mackerel

A. Description and Distribution

Common name: Mackerel

Scientific name: Scomber scombrus

French name: Maquereau bleu

Mackerel in the commercial catch measure 25 to 40 cm long and weigh 200 to 700 g. They inhabit waters where the temperature ranges between 9° and 12°C and migrate south annually, probably in response to seasonal changes in water temperatures in the northwest Atlantic.

There are two mackerel populations, one of which spawns in the southern Gulf of St. Lawrence. Mackerel overwinter in the depths along the steep slopes of the northwest Atlantic continental shelf. Adults and juveniles migrate inshore in May, and some enter the southern Gulf of St. Lawrence to

spawn and feed. In the spawning grounds in the southern Gulf, they reproduce in June and July.[2]

B. Fishing Methods

Mackerel are harvested in Quebec from May to October. The gillnet is the gear most widely used in the Gulf.

The mackerel fishery is a secondary activity for most fishermen, particularly Magdalen lobster fishermen.

C. Utilization

Mackerel are sold locally as fresh whole fish. They go to export markets as pickled whole fish, canned fish and frozen or pickled fillets. Given that mackerel is not popular on the Canadian consumer market, it is used mainly as bait for snow crab, lobster and longline fisheries.

American Eel

A. Description and Distribution

Common name: Eel

Scientific name: Anguilla rostrata

French name: Anguille d'Amérique

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[2] Ibid., p. 12.

The American eel is among the chief commercial species of the St. Lawrence estuary.[3] The eel fishery was disrupted in 1981 and 1982 because of the high mercury and MIREX content found in the meat. In 1981 West Germany, the largest export market for frozen eel, set strict standards with regard to MIREX content. Enforcement of that regulation marked a drastic decline in exports to that country and in eel landings in Quebec. The situation improved somewhat in 1983 when tight controls on the MIREX content of Canadian eels were introduced. Still, the prices paid to fishermen dropped more than 50% in 1983.

MIREX, concentrated mainly in Lake Ontario,[1] is used to manufacture insecti- p. 24
cides, certain plastics and pyrotechnic devices.

Eels in the estuarine fishery range from 75 to 125 cm in length and weigh from 1 to 5 kg.[2] The eel is the only catadromous fish in Quebec. The American eel is born in salt water, grows in fresh water and migrates offshore in spring to spawn in the depths of the Sargasso Sea. Most catches occur during the seaward migration.

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[3] See Table A.11.

[1] The entire eel catch in Lake Ontario contains MIREX, while about 30% of Quebec catches show no sign of the substance (including eels inhabiting the St. Lawrence River).

[2] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 15.

Although there are commercial eel fisheries in all five Atlantic provinces, 70% of all Canadian landings are made in Quebec along the St. Lawrence River, particularly between Trois-Rivières and Cap Chat. Most catches in the St. Lawrence estuary are made in the county of Kamouraska.

B. Fishing Methods

In Quebec eels are fished solely with weirs (fixed gear) and with hoop nets in the Lake Saint-Pierre area.

C. Utilization

The bulk of Quebec's eel harvest is sold as fresh whole fish, especially on European markets. A very small portion is sold locally as fresh or smoked fish. Exports are mostly in frozen blocks.

Capelin

A. Description and Distribution

Common names: Caplin, Atlantic silverside, sand smelt
Scientific name: Mallotus villosus
French name: Capelan

Capelin are a cold-water schooling species that lives offshore. The distribution of capelin is circumpolar; the species occurs in all Arctic seas and

along the Atlantic coast of North America, occasionally as far as the Gulf of Maine. They are extremely abundant off Labrador and Newfoundland, in the northwest Gulf of St. Lawrence around Gaspé and on the North Shore. In Quebec capelin are found downstream from Baie St-Paul and the Rivière-Ouelle.[3]

Adult capelin are fairly small, measuring from 13 to 20 cm.

B. Fishing Methods

In 1981 most of Quebec's capelin harvest was landed in the counties of Charlevoix and Rimouski/Rivière-du-Loup. Only inshore gear was used--weirs, beach seines and scoop nets during the spawning run.

C. Utilization

Capelin are marketed as frozen, dried or smoked fish. Females are fished to supply the roe market. Most of the Quebec catch is sold whole for use as fertilizer and bait.

American Smelt

A. Description and Distribution

Common names: Rainbow smelt, leefish, freshwater smelt, frost fish

Scientific name: Osmerus mordax

French name: Eperlan d'Amérique

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[3] Ibid., p. 11.

Smelt in the commercial catch range from 10 to 22 cm. Like the Atlantic salmon, American smelt are anadromous.[4]

In Quebec smelt occur all along the St. Lawrence River to the Gulf. They are also found in the Saguenay River and a number of lakes (St-Jean, Memphremagog and Champlain).

Estuarine smelt migrate upstream from April to May to spawn in fresh water in the spring. They reproduce below the head of the tide near river estuaries. After spawning, the smelt move back downstream to their feeding areas.

p. 25 B. Fishing Methods[1]

Gillnets and seines are the main gear used in the smelt fishery. While some fishing is done with gillnets in open water in November and December, most catches are made with trap nets set under the ice in the estuary and Chaleur Bay in January and February.

C. Utilization

Most of Canada's smelt production is exported frozen to Japan and the United

[4] Anadromous species spend their adult life in salt water and migrate to fresh or brackish water to spawn.

[1] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 13.

States. Some Great Lakes smelt[2] are sold fresh to the United States.

FIGURE 12 LIFE CYCLE OF ATLANTIC SALMON

SEA
RIVER
EGGS
ALEVIN
PARR
SMOLT
GRILSE (3 kg)
SALMON (5 kg)
LARGE SALMON (>6 kg)
1 YEAR AT SEA
2 YEARS AT SEA
3 YEARS AT SEA

Atlantic Salmon

A. Description and Distribution

Common names: Salmon, ouananiche, black salmon

Scientific name: *Salmo salar*

French name: Saumon de l'Atlantique

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[2] The gradual appearance of an industrial mobile-gear fishery in the Great Lakes has rivalled and perhaps replaced maritime leadership of this fishery. Apparently, the quality of anadromous capelin is comparatively superior.

Atlantic salmon are the fish most highly prized by sport fishermen and are in great commercial demand for their gastronomical value.

Atlantic salmon are anadromous (see Fig. 12). Adults swim upstream from early spring to late autumn. The spawning period normally occurs in October and November.

p. 26 Atlantic salmon occur throughout eastern Quebec from the Jacques Cartier River on the North Shore to the Rivière-Ouelle on the South Shore. The main salmon rivers are the St. Lawrence, Natashquan, Moisie, Romaine and Sainte-Marguerite rivers on the North Shore and the Cascapédia, Matapédia, Bonaventure and Matane rivers around the Gaspé Peninsula.

There are three types of salmon fisheries: commercial, recreational and subsistence. The commercial fishery occurs mostly on the North Shore.[1] A ban placed on commercial salmon fishing in Gaspé in 1972 was subsequently lifted in 1982 for a few rivers. Of the 15 or so salmon rivers draining into the estuary or the Saguenay, only a few have harvesting potential.[2]

During the period 1972-1978 close to 60% of recreational catches were in the affluents on the south side of the estuary, chiefly the Matane River.

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[1] See Tables A.7 and A.8.

[2] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 13.

Natives are permitted to practice subsistence fishing in a small number of Gaspé and North Shore rivers.

B. Fishing Methods

The commercial harvesting of Atlantic salmon is permitted only in specified waters with trap nets and gillnets.

C. Utilization

Atlantic salmon are marketed fresh, frozen or smoked.

(D) HARP SEAL

adult male and female

bedlamer

juvenile

pup

A. Description and Distribution

Common names: Greenland seal, saddle seal, saddle-back

Scientific name: Phoca groenlandica

French name: Phoque du Groenland

The harp seal is a marine mammal of the Arctic regions. It enters our regions during winter migration to its breeding grounds on the "Front" (off southern Labrador) and in the southern Gulf of St. Lawrence.

Males are only slightly larger than females; the average length from the nose to the tip of the tail of adult males is 166 cm, whereas adult females measure 162 cm. Weight ranges from 85 to 190 kg, depending on the time of year.

Females give birth on the winter pack ice from late February to late March. Harp seals migrate and feed in loose herds of up to several hundred individuals.

In 1983 the harp seal catch amounted to 10,274 individuals, valued at $200,000, or 0.3% of the total landed value in Quebec.[3]

The harp seal is known by different names depending mainly on its age and commercial properties. Newborn pups from birth to two weeks old are called "white coats." Young under one year old are called "tanners" or "beaters." Juveniles are known as "bedlamers" and adults as "old hearts."

The harp seal population is divided into two breeding areas. From January to March, the "Front" herd whelps (gives birth) off Newfoundland, the "Gulf" herd north of the Magdalen Islands. From January to April a sub-population of the St. Lawrence estuary migrates to the mouth of the Saguenay.

The Nova Scotia, Newfoundland and Quebec seal industries share exploitation of this resource.

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[3] See Table A.3.

B. Fishing Methods

In the Gulf harp seals are hunted or fished. Pups are hunted with clubs. Later in the season adults are hunted with rifles. Seals are fished with two types of nets: shoal nets (see Fig. 112) and weirs. In Quebec inshore hunters generally use boats under 45 feet (13.7 m) long to reach the pack ice. In the Magdalens the boats are generally 35 to 65 feet (10.7 to 19.8 m) long.

C. Utilization p. 27

In the 18th and 19th centuries the sealing industry was closely tied to the commercial demand for harp seal oil, which was used as lamp fuel, cooking oil and a lubricant.

Today, Canadian sealers, including those of Quebec, derive their income from the sale of seal fur and leather. Seal meat is also a consumer product. Dressed, headless carcasses can be used as food for fur-bearing animals (foxes and visons).[1]

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[1] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 19.

2. Fishery Activities
(Landings)

This section provides a brief analysis of the statistical trends that marked total landings, landings by species and landed prices in 1970 and 1977 to 1983. Each of the subsections covers the situation in Quebec and each of the six study regions.

(A) TOTAL LANDINGS

The term "landing" designates any fish landed in Quebec and sold to consumers and industrial producers as well as any fish sold as bait.[2] The landings of all species are measured in metric tons (t). Landed values are expressed in current dollars ($) and designate the amount received by fishermen from the sale of fish prior to any type of processing.[3]

Quebec

A small part of the commercial fishery in Quebec takes place in the Atlantic Ocean, but the bulk of activity occurs in the estuary and gulf of the St. Lawrence River. The area is bounded to the east by the counties of Charlevoix and L'Islet. In 1976 the Canadian government stepped in to protect groundfish stocks by placing a freeze on licences and imposing

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[2] BSQ, Pêche commerciale, 1981, p. 12.

[3] Ibid.

species-specific quotas on mobile-gear fisheries. The 1976 groundfish management guidelines promoted tremendous gains in landings posted during the period 1977-1982. Fig. 13 shows an increase of 29,311 t during that time, with landings climbing from 49,863 t to 79,174 t. The key factors contributing to that growth were: an increase in stock sizes, fleet modernization and the introduction of new trawlers, the regulation of foreign-vessel fisheries in Canadian territorial waters[4] and improvements p. 28 in fish catching methods. In 1983 total landings amounted to 70,760 t, a drop of 8,414 t from 1982. That 11% decline apparently stemmed from a delay in opening the fishing season for certain species and the shift in landings to plants in New Brunswick owing to a labour dispute in Quebec.

FIGURE 13 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES, QUEBEC, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)

- Quantity
- Value

Value

Quantity

Year

SOURCE: See Table A.3.

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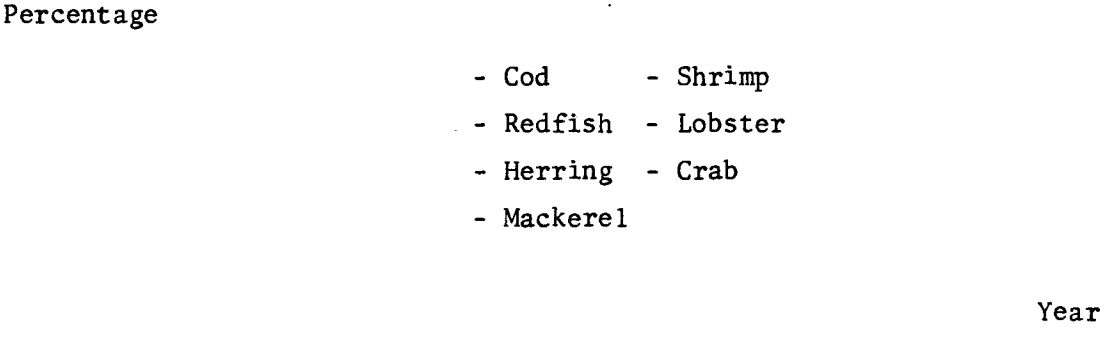
[4] Foreign vessels are prohibited from fishing within the 200-mile zone defined by Canada in 1977 unless issued licences, which carry federally imposed restrictions.

The main species in the Quebec catch are: cod, crab and redfish (see Fig. 14). Shrimp and lobster, although smaller fisheries, have important economic input for Quebec fishermen.

The total value of landings in Quebec rose from 1970 to 1983, peaking at $55,276,246 (see Fig. 13). That figure seems fairly small compared to Quebec's gross domestic product. But as that monetary inflow is channeled into the primary sector of the fisheries industry and benefits chiefly the maritime regions of Quebec, it represents a vital contribution.

FIGURE 14 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, QUEBEC, 1970, 1977-1983



SOURCE: See Table A.10.

FIGURE 15 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, QUEBEC, 1970, 1977-1983

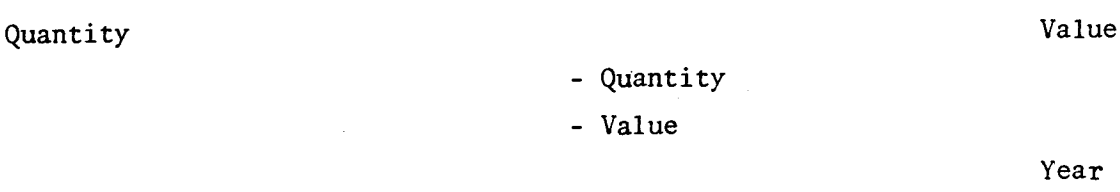
SOURCE: See Table A.10.

St. Lawrence

The commercial fishery in the St. Lawrence region has fluctuated since the late 1970s. According to the statistics (see Fig. 16), total landings reached 2,108 t in 1980, as opposed to 891 t in 1970. Turbot, crab, capelin, herring and eel are the main harvests. The St. Lawrence is the only region of Quebec in which eel catches are reported. From 1980 to 1983 landings fell by 1,233 t, from 2,108 t to 875 t.

Landed values reflected the fluctuations in landings to an appreciable extent (see Fig. 16).

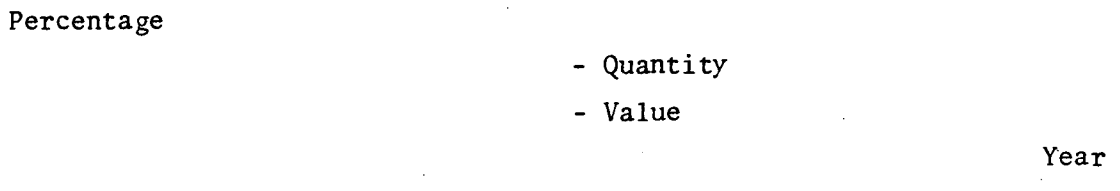
p. 29 FIGURE 16 AGGREGATE LANDINGS AND LANDED VALUE OF MAIN SPECIES, ST. LAWRENCE, 1970, 1977-1983
(IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)



SOURCE: See Table A.4.

In 1983 the landed value was estimated at $1,092,741, compared to $1,280, 067 in 1982. That 15% decline corresponded to a 45% decline in landings, which fell from 1,605 t in 1982 to 875 t in 1983. Despite the economic input from the fisheries in the region, landings of all species rarely account for more than 2.5% of all commercial landings in Quebec (see Fig. 17).

FIGURE 17 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN THE REGION AS PERCENTAGE OF AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN QUEBEC, ST. LAWRENCE, 1970, 1977-1983



SOURCE: See Table A.17.

Northern Gaspé

The Northern Gaspé is a fishing region that boasts considerable harvests. In 1983 landings there accounted for 25.5% of all landings in Quebec (see Fig. 19). The fisheries industry witnessed strong growth in the region in the late 1970s. Cod, redfish, sole and shrimp are the main species harvested. From 1978 to 1982 total landings of the main species maintained a higher level than in 1970 (see Fig. 18). From 1982 to 1983, however, landings dropped 15%, from 20,974 t to 17,781 t, thus dipping below the levels posted in 1970 and 1977.

The landed value of the main species in Northern Gaspé peaked in 1981 at $14,945,570, for 25,142 t (see Fig. 18). The 1980-83 decline in landings depressed landed values as well, although the drop was not immediate or as sharp. Indeed, a downswing is evident in 1982 and 1983. The landed value in 1983 is estimated at $12,691,775, for catches totalling 17,781 t. While the 1983 landed value declined 5% from 1982, landings declined 15%.

p. 30

FIGURE 18 AGGREGATE LANDINGS AND LANDED VALUE OF MAIN SPECIES, NORTHERN GASPE, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)

Quantity

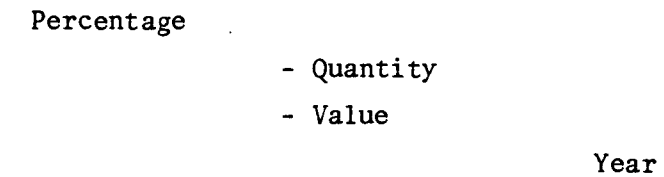
Value

- Quantity
- Value

Year

SOURCE: See Table A.5.

FIGURE 19 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN THE REGION AS PERCENTAGE OF AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN QUEBEC, NORTHERN GASPE, 1970, 1977-1983



SOURCE: See Table A.18.

Southern Gaspé

For the period 1977-1983 the harvest in this region accounted for upwards of 25% of all landings in the province, whereas in 1970 that figure stood at about 50% (see Fig. 21). Southern Gaspé fisherman harvest mainly cod, herring, lobster and crab. From 1970 to 1977 landings fell by 45,418 t, from 60,135 t in 1970 to 14,717 t in 1977 (see Fig. 20). The relatively strong drop is explained by government measures introduced in 1976 (freeze on licences and imposition of quotas for certain species).

p. 31 Landed values marked steady improvement from 1970 to 1983, although dipping more than $700,000 from 1979 to 1980 (see Fig. 20). In 1983 the landed value was $15,918,728, marking an increase of $2,555,848 over the previous year, for a gain of 19%. Although landings since 1977 are fairly small compared to those recorded in 1970, landed values have steadily increased.

FIGURE 20 AGGREGATE LANDINGS AND LANDED VALUE OF MAIN SPECIES, SOUTHERN GASPE, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)

Quantity — Value ($'000)

- Quantity
- Value

Year

SOURCE: See Table A.6.

FIGURE 21 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN THE REGION AS PERCENTAGE OF AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN QUEBEC, SOUTHERN GASPE, 1970, 1977-1983

Percentage

- Quantity
- Value

Year

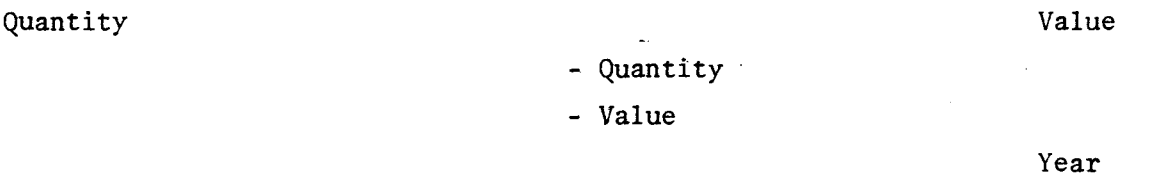
SOURCE: See Table A.19.

Western North Shore

Landings in this region accounted for an average 5% of total landings in Quebec between 1977 and 1981. An upward trend is observed in 1983, when landings amounted to 7.9% of all landings in Quebec (see Fig. 23]. The year 1970 marked the beginning of intensive commercial fishery in the Western North Shore region, where the main species harvested are cod, crab, shrimp and herring. Unlike total landings in Quebec, which dropped

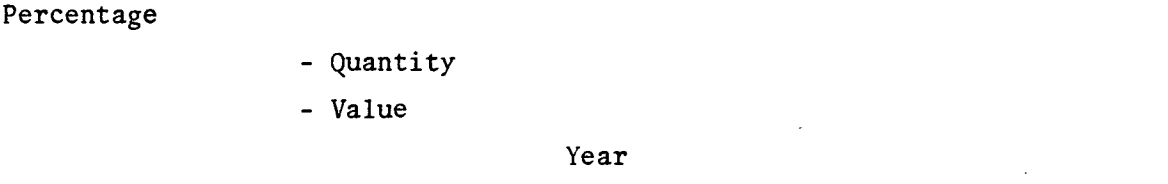
considerably in 1977 as compared to 1970 and then showed modest gains until 1982, landings in this region posted a steady increase during those years (see Figs. 13 and 22). In 1983 landings were estimated at 5,504 t, a decline of 6% from 1982.

p. 32 FIGURE 22 AGGREGATE LANDINGS AND LANDED VALUE OF MAIN SPECIES, WESTERN NORTH SHORE, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)



SOURCE: See Table A.7.

FIGURE 23 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN THE REGION AS PERCENTAGE OF AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN QUEBEC, WESTERN NORTH SHORE, 1970, 1977-1983



SOURCE: See Table A.20.

Landed values moved upwards from 1970 to 1983 (see Fig. 22). In 1983 the value of the catch reached $5,725,132, an increase of $1,239,092 over

1982. This represents an increase of 28%, despite a decline of 378 t (6%) in landings.

Eastern North Shore

The economy of the entire Eastern North Shore, with the exception of Havre-Saint-Pierre, is based wholly on the fishing industry, which is vital to the survival and growth of local communities. Landings in the region totalled 10,103 t in 1983, an increase of 14% over 1982 (see Fig. 24). The main species harvested are cod, crab, herring and lobster. This is the only region that posted an increase in landings from 1982 to 1983, as well as a larger harvest in 1983 than in 1970 (an increase of 4,608 t). For the period 1970-1983 the harvest growth rate in the Eastern North Shore outpaced that of the province, soaring from 5% in 1970 to 14.3% in 1983 (see Fig. 25). Since 1970 landed values, too, have shown an upward trend. Fig. 24 shows a landed value of $5,238,811 for 1983, for a gain of $1,204,699, or 30%, over 1982. p. 33

FIGURE 24 AGGREGATE LANDINGS AND LANDED VALUE OF MAIN SPECIES, EASTERN NORTH SHORE, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)

Quantity

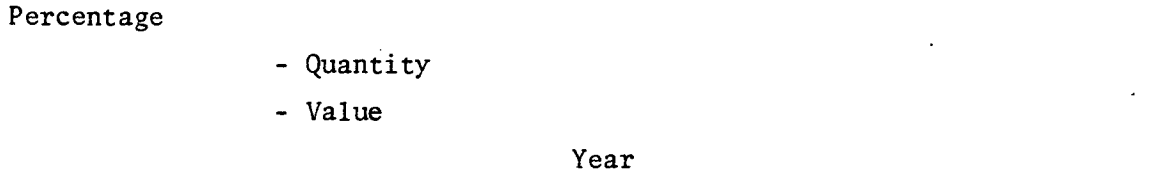
Value ($'000)

- Quantity
- Value

Year

SOURCE: See Table A.8.

FIGURE 25 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN THE REGION AS PERCENTAGE OF AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN QUEBEC, EASTERN NORTH SHORE, 1970, 1977-1983



SOURCE: See Table A.21.

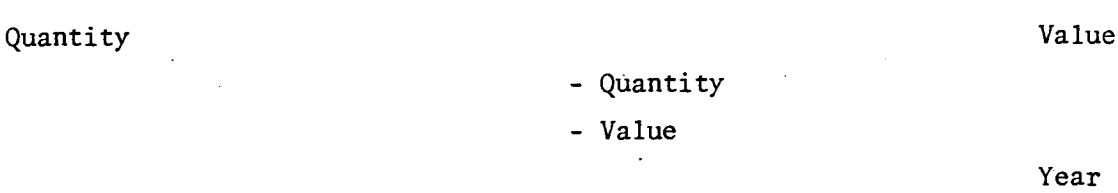
Magdalen Islands

The fishing industry is the mainstay of the economy of this region, situated in the middle of the Gulf of St. Lawrence. This maritime region encompasses all of the communities in the archipelago of the same name. Landings in the Magdalens make up 20% to 25% of all landings in Quebec (see Fig. 27). Redfish, crab, lobster and mackerel are the main species harvested (see Fig. 26). Landings followed an upward trend during the period 1977-1982.

p. 34 Although the harvest was larger in 1983 than in 1977, it was 4,107 t smaller than in 1982, falling from 20,543 t to 16,436 t.

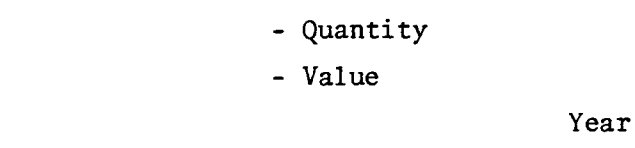
Landed values marked an upswing between 1977 and 1983. Despite a drop of 4,107 t from 1982 to 1983, the total landed value rose by $770,025, up from $12,504,049 to $13,274,874 (see Fig. 26). This contribution by the fishing industry is the major input to the economy of the archipelago.

FIGURE 26 AGGREGATE LANDINGS AND LANDED VALUE OF MAIN SPECIES, MAGDALEN ISLANDS, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED AND THOUSAND DOLLARS)



SOURCE: See Table A.9.

FIGURE 27 AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN THE REGION AS PERCENTAGE OF AGGREGATE LANDINGS AND LANDED VALUE OF ALL SPECIES IN QUEBEC, MAGDALEN ISLANDS, 1970, 1977-1983



SOURCE: See Table A.22.

(B) LANDINGS BY SPECIES

This subsection deals with landings of the main species in Quebec and the six study regions. The analysis for Quebec as a whole is divided into two parts. The first deals with landings and landed values of the main species in 1983 as compared to aggregate landings in the province. The second presents trends for landings of the various study species. Landings are grouped in four main classes designated as expansionist,

p. 35 regressive, convex and constant. These are not official classifications but are used here to describe the behaviour of the curves plotted for the study species. The main species were determined on the basis of the size and value of their harvests in 1983 as compared to the size and value of all catches in the region.

Quebec

Landings and Landed Value of Main Species

In order of quantity landed, cod, crab and redfish are the three main species fished in Quebec. In 1983 they accounted for 46.8%, 14.9% and 13.7%, respectively, of all landings in the province (see Fig. 14). In terms of landed value, cod, crab, lobster and shrimp head the list. Molluscs and crustaceans are among the most highly prized sea products. Although they are harvested in limited quantities, they make a significant contribution to the income of fishermen, producers and distributors.

The landed values of the main crustaceans relative to the aggregate landed value for Quebec stand at 27.8% for crab, 17.8% for lobster and 13.4% for shrimp (see Fig. 15). Other species, including herring and mackerel, are relatively important. The two pelagic species cited make up 4.0% and 3.1%, respectively, of total landings in Quebec.

Trends

(1) Expansionist Species

The trend for expansionist species is characterized by an upward movement

in landings since 1970. The species in this class are cod, mackerel, shrimp and crab.

Cod

Despite overexploitation in the late 1960s, cod landings in Quebec picked up considerably owing to better management of this resource. In 1981 landings totalled 37,696 t, valued at more than $18.5 million. This was followed by a downward movement until 1983, with landings falling to 33,103 t, valued at about $15.5 million.

Mackerel

The mackerel harvest in Quebec posted an upward trend until 1982 (see Fig. 28), with landings reaching 3,485 t, valued at more than $1.1 million. In 1983 total catches took a downturn, dropping to 2,164 t, valued at about $600,000. The mackerel harvest is small owing to low market demand. Under an agreement with the Canadian International Development Agency (CIDA), fishermen have found an outlet for mackerel, particularly for the Magdalen Islands catch.

FIGURE 28 LANDINGS OF EXPANSIONIST SPECIES, QUEBEC, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED)

Quantity

- Cod
- Mackerel
- Shrimp
- Crab

Year

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

Shrimp

Quebec's commercial shrimp fishery dates back to 1965. This shellfish
p. 36 became popular in the early 1970s. Shrimp landings exhibited steady growth over the next years (see Fig. 28). In 1983 landings reached 5,550 t, valued at about $7.5 million. Quebec fishermen harvest shrimp mainly from the stock off Sept-Iles, west of Anticosti Island. The three other stocks harvested occur off northern and southern Anticosti and in the Esquiman Channel. The first quota on the shrimp fishery was imposed in 1983.

Crab

Crab landings have moved upwards since 1970. In 1982 quantities peaked at 11,644 t, valued at slightly more than $10 million. In 1983 landings declined by some 10%, with the catch totalling 10,515 t, valued at $15.3 million. The fairly strong increase in landings from 1978 to 1979, up from 2,410 t to 4,774 t, is explained by the issuing of 22 new inshore fishing licences during that period. Likewise, the rise in landings posted from 1979 to 1980 (from 4,774 t to 6,438 t) coincided with the issuing of seven new offshore fishing licences. In 1984 a first quota--set at 26,000 t--was imposed on the licensed offshore crab fishery in the Gulf. Licences for offshore crab fishermen are limited and the fishing effort is regulated through an imposed limit of 150 rectangular traps or 300 Japanese conical traps. The inshore crab fishery is subject to a limit of 25 to 100 traps per fisherman.

(2) Regressive Species

The species for which landings declined significantly in 1970 fall into the regressive class. These are: redfish, herring and scallop.

Redfish

The commercial redfish fishery began around 1935 as a result of technological advances in the areas of filleting and fast freezing.

The redfish fishery was not subject to quotas before 1970. That year, redfish landings in Quebec amounted to 26,533 t (see Fig. 29). That level of harvesting considerably reduced the redfish population. In 1977 landings in Quebec had plummeted to 9,111 t. In 1983 they reached 9,711 t, valued at slightly more than $2 million.

Herring

Until the mid-1960s herring was taken by inshore fishermen in most regions of Atlantic Canada. The herring fishery usually occurred during the spawning runs and was limited much more by a lack of markets than by a shortage of the fish. From 1965 to 1972 Quebec landings rose rapidly following the commissioning of a fleet of large seiners. In 1970 the use of those vessels raised the total herring catch to 54,077 t. That harvesting rate brought on a decline in the herring population. In 1977 landings amounted to 3,952 t, then showed a modest gain until 1979. The fishery then marked a downturn until 1983, when landings stood at 2,844 t. This collapse is explained by

the cutback in the Total Allowable Catch (TAC) for herring since 1980.

FIGURE 29 LANDINGS OF REGRESSIVE SPECIES, QUEBEC, 1970, 1977-1983
(IN THOUSAND METRIC TONS AS LANDED)

Quantity

- Redfish
- Herring
- Scallop

Year

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

p. 37 Scallop

The large scallop harvests in the Magdalen Islands, estimated at 498 t landed weight in 1970, can be attributed to the activity of 64 vessels measuring 35 to 65 feet (10.7 to 19.8 m), which harvested scallops almost non-stop during the fishing season. That strong activity resulted in depletion of the stocks. In 1977 landings plummeted to 54 t. This was followed by a gradual recovery owing to the commissioning of new vessels and the issuing of 13 new licences in the winter of 1978-79. That step-up in the fishing effort reduced the scallop populations, which in turn depressed landings from 1981 to 1982. In 1983 the scallop harvest amounted to 90 t.

(3) Convex Species

This class encompasses all species that have undergone both inclines and declines in landings (see Fig. 30); the curves for these species are bell-shaped. This class covers turbot, sole, eel, smelt, capelin,

soft-shell clams and whelks.

Turbot

Only recently has turbot been actively harvested by Quebec fishermen. In the early 1970s turbot was a by-catch of the trawler fisheries. Fishermen lacked the appropriate catching techniques and therefore had little interest in a turbot fishery. With the development of gillnetting, landings gradually rose to 5,992 t in 1978. The size of the harvest prompted the assumption that there was an indigenous turbot population in the Gulf of St. Lawrence. In 1983, however, landings declined by 1,898 t, levelling off at 856 t.

Flounder and Sole

In Quebec flounder and sole are a by-catch of the cod and redfish trawl fisheries. Landings fell off steadily from 1978 to 1982, then turned around in 1983, when the harvest reached 1,815 t.

Eel

At one time the eel fishery was geared solely to supplying local markets. This catadromous species[1] is popular in several European countries, including West Germany. High pollution levels and growing consumer demand in Europe led countries there to step up eel imports, a move that benefitted Quebec fishermen and producers. As a result, the commercial eel fishery developed and Quebec landings climbed in the 1970s.

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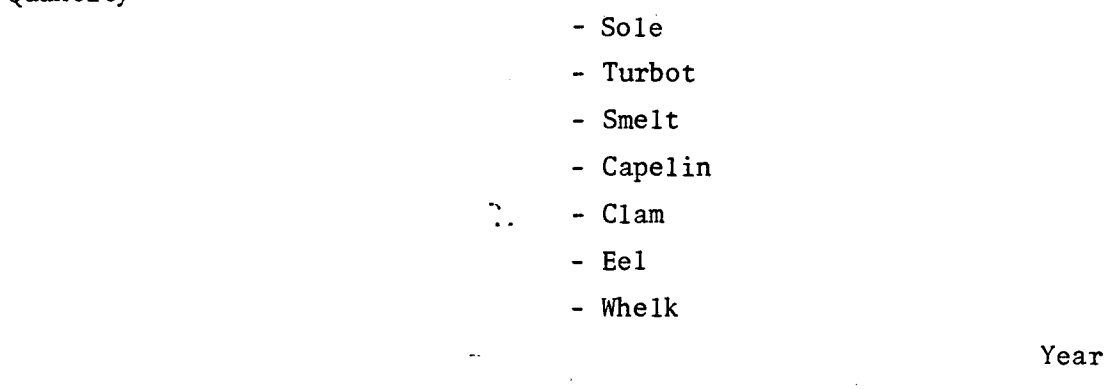
[1] Catadromous fish spend their adult life in fresh water and spawn in salt water.

FIGURE 30 LANDINGS OF CONVEX SPECIES, QUEBEC, 1970, 1977-1983
(IN THOUSAND METRIC TONS AS LANDED)



SOURCES: 1. BSQ, Pêche commerciale, 1970, 1977-1983.
2. See Table A.3.

In February 1982, with the pesticide (MIREX) content exceeding its new norms, the West German government turned its back on eel imports from Canada, most of which came from Quebec. Consequently, in 1983 landings fell 11 t from the previous year, settling at 221 t.

Smelt

Smelt constitute an inshore fishery. Like salmon, smelt is a migratory
p. 38 species that swims upriver to spawn in fresh water. The commercial smelt fishery extends from late autumn to the end of February. Landings peaked at 594 t in 1978, then dropped to only 128 t in 1983.

Capelin

At the turn of the century, the three main products manufactured from capelin were raw fertilizer, codfish bait and dog food. Although the fishery is still earmarked in part for the manufacture of these products, human consumption of fresh, frozen and canned capelin has steadily increased, particularly in central Europe. Landings rose up until 1980, when they totalled 488 t. In 1983 they amounted to only 103 t. It would appear that the trawl fisheries for other species depleted the capelin stocks and thus affected landings. However, this theory has never been confirmed.

Soft-shell clam

No licence is required to harvest soft-shell clams, which can simply be picked up along the shores. Soft-shell clams are harvested for human consumption and occasionally as groundfish bait.[1] Despite the upward trend in landings from 1970 to 1979, no soft-shell clam catches were recorded in 1983. A permanent ban has been imposed on clam harvesting in certain locations owing to pollution. Problems with toxicity caused by a microscopic alga results in the sporadic closing of those clam beds that are not permanently off limits because of pollution.

Whelk

The whelk fishery is a traditional one focused on local consumption and

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[1] Anderson, A. and M. Gagnon. Les ressources halieutiques de l'estuaire du Saint-Laurent. Canadian Industry Report on Fisheries and Aquatic Sciences (No 119), December 1980, p. 3.

canning. These molluscs, which are also known as roughs, have always been taken in small quantities. The small catch of 36 t recorded in 1983 is apparently explained by the relatively large 1982 harvest of 305 t. The rebuilding of whelk stocks has been very slow throughout the province, except in the Matane area. However, the effects of overexploitation are confined to the areas being harvested and do not seem to affect adjacent unexploited areas.

(4) Constant Species

This class encompasses all species that have produced fairly stable curves. Indeed, there is no significant incline or decline in the landings of these species. i.e., lobster, halibut and salmon.

Lobster

Lobster is a crustacean in great demand. The lobster fishery in Quebec is concentrated in the Magdalens. The fishing effort is regulated by the number of licences in circulation, the number and size of traps and the length of the fishing season. Since these restrictions were implemented, average landings have remained fairly stable overall, local fluctuations notwithstanding. In 1983 landings across Quebec amounted to 2,092 t, valued at close to $10 million.

FIGURE 31 LANDINGS OF CONSTANT SPECIES, QUEBEC, 1970, 1977-1983
(IN THOUSAND METRIC TONS AS LANDED)

Quantity

- Salmon
- Lobster
- Halibut

Year

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

Halibut p. 39

Aggregate landings of halibut in Atlantic Canada are far inferior to those of any other smaller flatfish. This species is designated generically as "flounder." The halibut harvest is only marginal in Quebec. For the period 1970-1983 halibut landings remained below the threshold of 200 t. In 1983 they rose by 49 t over 1982, reaching 97.5 t.

Salmon

The trend of salmon landings resembles that of halibut. Although the salmon fishery is highly profitable in commercial terms, catches have remained fairly small. From 1977 to 1983 landings fluctuated between 50 t and 125 t. The harvesting of this resource is highly regulated. As of the 1970s the application of a program to buy back salmon fishing licences reduced the number of commercial salmon fishermen. The North Shore contingent of salmon fishermen declined from 211 in 1971 to 110 in 1982.

Regional Landings by Species

This analysis of landings by species for each of the study regions identifies the main species in terms of landings and landed value. Comparative analysis of regional and Quebec landings and landed values for each of the main species draws fishery profiles of the areas in question. Note that this study is confined to the main species inventoried in 1983.

St. Lawrence

In 1983 crab was the main species in terms of landings recorded in the St. Lawrence region. Catches totalled 361 t, for a value of $445,000 (see Figs. 32 and 33). This crustacean made up 39.9% of total landings and 37.8% of total landed value in the region (see Figs. 34 and 35). Next, in decreasing order of quantity, were eel (221 t), turbot (121 t) and capelin (103 t). Prior to 1983 the region posted very large herring catches. The St. Lawrence region accounted for an estimated 99.9% of landings and 99.7% of the landed value of eel in Quebec (see Figs. 36 and 37). Although the landings and landed value of capelin made up 11.4% and 1.2%, respectively, of total landings in the region, this is the only area where capelin were fished.

Northern Gaspé

Cod is the main species harvested in the Northern Gaspé. In 1983 cod landings reached 10,327 t, valued at slightly more than $5 million (see Figs. 38 and 39). The other important species in terms of landings are shrimp (4,831 t), redfish (849 t) and sole (846 t). Figs. 40 and 41 show cod and shrimp

representing, respectively, 57.3% and 26.8% of total landings and 39.6% and 49.4% of total landed value in the region. Redfish and sole claimed the same proportion (4.7%) of regional landings, for landed values of 1.7% and 2.0%, respectively. In 1983 shrimp made up 26.8% of total landings in Northern Gaspé, which accounted for 87% of the quantity and 86.4% of the value of total shrimp landings in Quebec (see Figs. 42 and 43). Sole made up 4.7% of all landings in the region, but 46.6% of the quantity and 51.9% of the value of Quebec's sole harvest. The quantity and value of turbot landings were small in relation to total landings in the region, but were substantial in relation to Quebec's turbot harvest. Indeed, the Northern Gaspé accounted for 76.8% of the quantity and 74.3% of the value of the provincial turbot catch.

Southern Gaspé

Fig. 44 shows that the dominant species in Southern Gaspé in 1983 was cod (11,047 t), followed by crab (4,315 t), herring (1,341 t) and lobster (795 t). That year the landed value of crab was about $6.5 million, while that of cod exceeded $5 million (see Fig. 45). In this region of the Gaspé Peninsula, landings and landed value of cod stood at 57.6% and 31.1%, respectively (see Figs. 46 and 47). The region accounted for 27.8% and 33.3% of the quantity and value, respectively, of Quebec's cod harvest (see Figs. 48 and 49). In 1983 crab accounted for 22.5% of landings and 39.3% of the landed value in the region. The harvest of this crustacean in Southern Gaspé made up 41.0% of the quantity and 42.3% of the value of Quebec's crab harvest. Lobster accounted for 4.1% of the quantity and 22.9% of the value of total

landings in the region. Southern Gaspé fishermen contributed 38% of the quantity and 38.6% of the value of the provincial lobster harvest. Herring catches in the region made up 7.0% of landings and 2.0% of the landed value in the region. By contrast, they accounted for 47.2% of the quantity and 43.2% of the value of the provincial herring harvest.

p. 40 Western North Shore

In 1983 crab was the main species harvested in the Western North Shore. Landings of this crustacean stood at 2,180 t (see Fig. 50), valued at more than $3.2 million (see Fig. 51). The other species of relative importance were cod (2,039 t), shrimp (719 t) and herring (347 t). Fig. 52 shows crab representing 39% of landings and 53.9% of the landed value in the region in 1983. Fig. 54 shows the Western North Shore accounting for 20.7% of the quantity and 21.1% of the value of Quebec's crab catch. Cod made up 35.6% of landings and 16.1% of the landed value in the region, which accounted for 5.1% of the quantity and 6.3% of the value of the provincial cod harvest. Shrimp claimed 12.9% of the quantity and 16.8% of the value of total regional landings. The proportion of Quebec's shrimp harvest landed in the Western North Shore stood at 12.9%, making up 13.6% of the provincial landed value. Herring made up 6.2% of landings and 2.2% of the landed value in the Western North Shore region, which accounted for 12.2% of the quantity and 16.8% of the value of the provincial herring catch. While the quantity and value of regional salmon catches seem proportionally low (0.7% and 4.8%, respectively), it remains that 48.2% of the quantity and 54.9% of the value of Quebec's

salmon harvest were claimed by this region. Indeed, Quebec salmon are taken mainly in the Western North Shore.

Eastern North Shore

The cod fishery is staged mainly in the Eastern North Shore. In 1983 landings of this fish stood at 8,144 t, valued at $3.6 million (see Figs. 56 and 57). The other main species in terms of quantity were crab (1,141 t) and herring (759 t). Cod made up 80.6% of the landings and 68.9% of the landed value in the region, which accounted for 20.5% of the quantity and 23.4% of the value of Quebec's cod harvest. Crab made up 11.3% of the quantity and 22.2% of the value of all landings in the Eastern North Shore, which claimed 10.9% of the quantity and 7.6% of the value of the provincial crab catch. In 1983 herring made up 7.5% of all landings and 3.9% of total landed value in the region, which accounted for 26.7% of the quantity and 16.8% of the value of Quebec's herring harvest.

Magdalen Islands

In terms of the size of landings in 1983 (see Fig. 62), the Magdalen Islands region was characterized by the harvesting of redfish (8,774 t), crab (2,412 t), mackerel (1,846 t) and lobster (1,209 t). That year the redfish catch was valued at $1.9 million, the crab catch at $3.8 million and the mackerel catch at $500,000, while the lobster catch represented a total income of $5.6 million for fishermen. In 1983 redfish accounted for 51.8% of all landings in the region (14.6% of the landed value) and 90.4% of Quebec's redfish harvest (88.7% of the landed value). Crab made up 14.2%

of total landings in the Magdalen Islands (28.9% of the value), and the region accounted for 22.9% of the quantity and 25% of the value of the provincial crab harvest. Mackerel claimed 10.9% of landings and 3.8% of the landed value in the region, which made up 85.3% of the quantity and 87.2% of the value of Quebec's mackerel catch. Lobster landings made up 7.1% of the total catch in the archipelago, for 42.3% of the landed value. Of the provincial lobster catch, 57.8% of the quantity and 57.2% of the value were accounted for by the Magdalens. In sum, Magdalen Island fishermen specialize in the exploitation of redfish, mackerel and lobster.

FIGURE 32 LANDINGS OF MAIN SPECIES, ST. LAWRENCE, 1970, 1977-1983 p. 41
(IN THOUSAND METRIC TONS AS LANDED)

Quantity

- Turbot
- Crab
- Capelin
- Eel

Year

SOURCE: See Table A.4.

FIGURE 33 LANDED VALUE OF MAIN SPECIES, ST. LAWRENCE, 1970, 1977-1983
(IN THOUSAND DOLLARS)

Value

- Turbot
- Crab
- Capelin
- Eel

Year

SOURCE: See Table A.4.

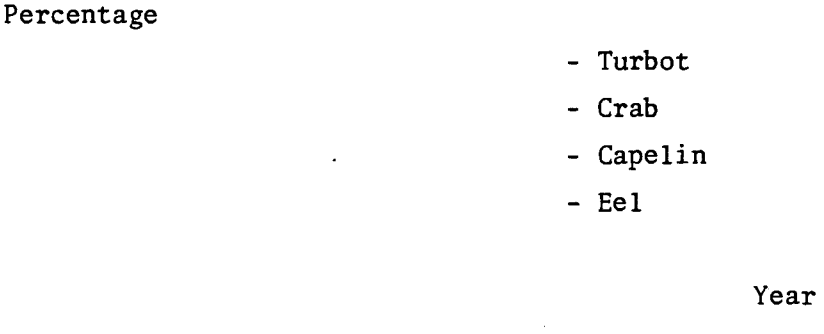
p. 42 FIGURE 34 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN THE REGION, ST. LAWRENCE, 1970, 1977-1983

SOURCE: See Table A.11.

FIGURE 35 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN THE REGION, ST. LAWRENCE, 1970, 1977-1983

SOURCE: See Table A.11.

FIGURE 36 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, ST. LAWRENCE, 1970, 1977-1983 p. 43

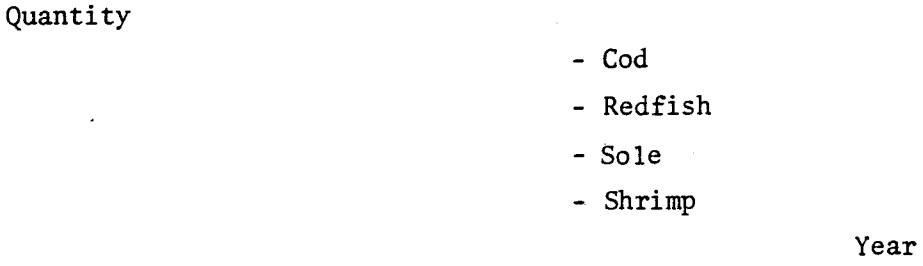


SOURCE: See Table A.17.

FIGURE 37 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, ST. LAWRENCE, 1970, 1977-1983

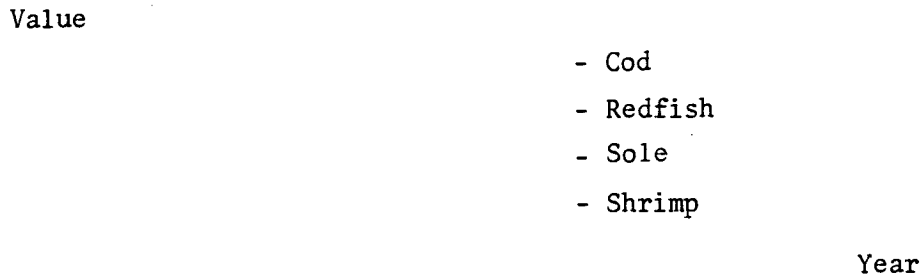
SOURCE: See Table A.17.

p. 44 FIGURE 38 LANDINGS OF MAIN SPECIES, NORTHERN GASPE, 1970, 1977-1983
(IN THOUSAND METRIC TONS AS LANDED)



SOURCE: See Table A.5.

FIGURE 39 LANDED VALUE OF MAIN SPECIES, NORTHERN GASPE, 1970, 1977-1983
(IN THOUSAND DOLLARS)



SOURCE: See Table A.5.

FIGURE 40 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN THE REGION, NORTHERN GASPE, 1970, 1977-1983 p. 45

Percentage

- Cod
- Redfish
- Sole
- Shrimp

Year

SOURCE: See Table A.12.

FIGURE 41 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN THE REGION, NORTHERN GASPE, 1970, 1977-1983

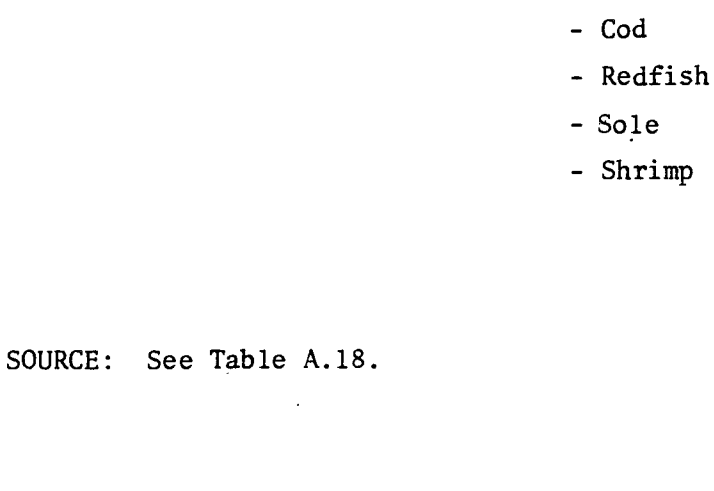
Percentage

- Cod
- Redfish
- Sole
- Shrimp

Year

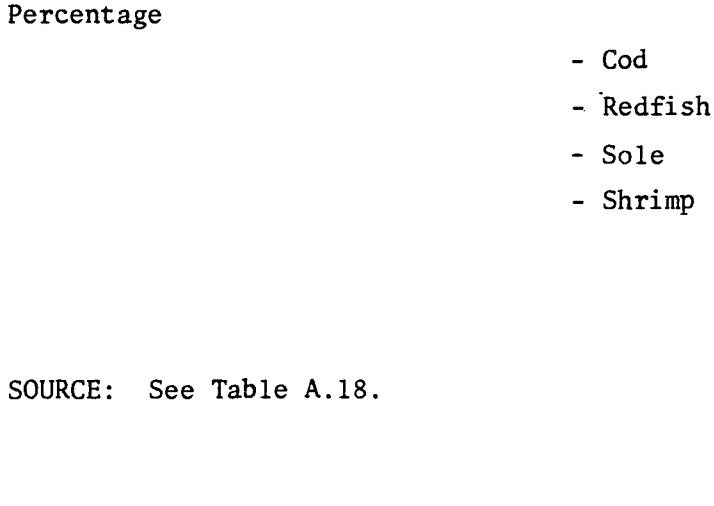
SOURCE: See Table A.12.

p. 46 FIGURE 42 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, NORTHERN GASPE, 1970, 1977-1983



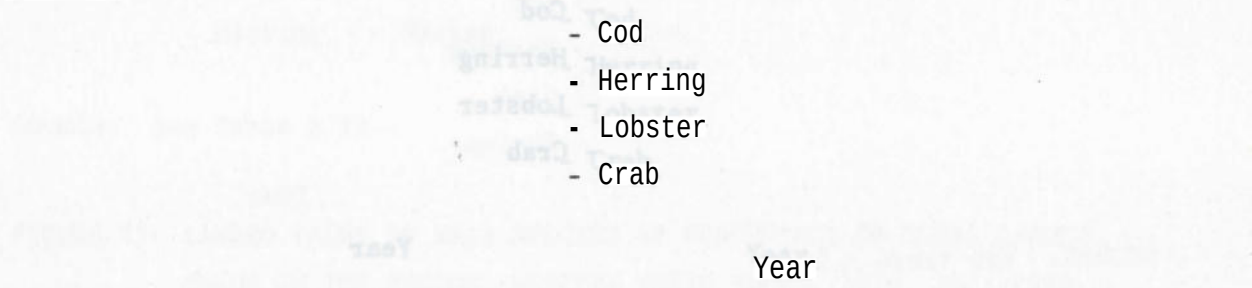
SOURCE: See Table A.18.

FIGURE 43 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, NORTHERN GASPE, 1970, 1977-1983



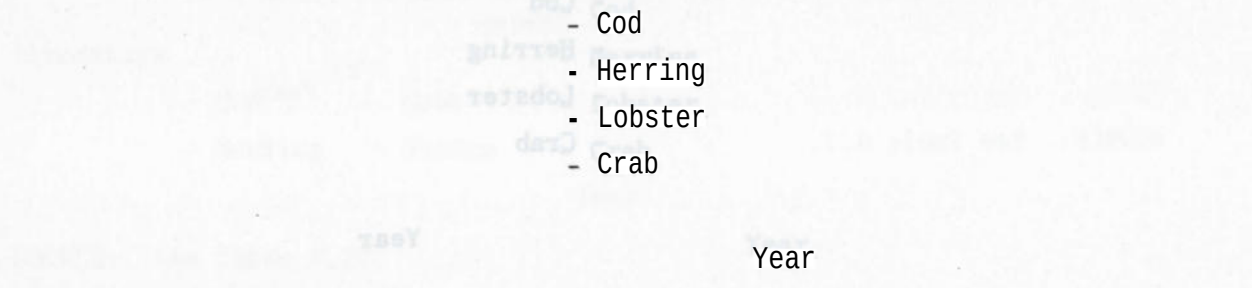
SOURCE: See Table A.18.

FIGURE 44 LANDINGS OF MAIN SPECIES, SOUTHERN GASPE, 1970, 1977-1983 p. 47
(IN THOUSAND METRIC TONS AS LANDED)



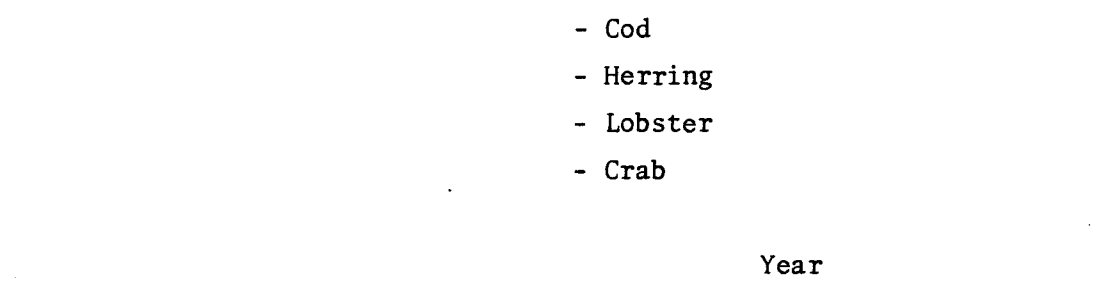
SOURCE: See Table A,6.

FIGURE 45 LANDED VALUE OF MAIN SPECIES, SOUTHERN GASPE, 1970, 1977-1983
(IN THOUSAND DOLLARS)



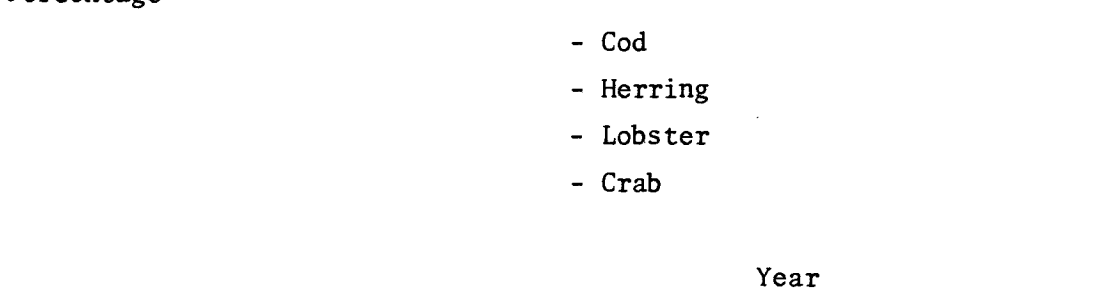
SOURCE: See Table A.6.

p. 48 FIGURE 46 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN THE REGION, SOUTHERN GASPE, 1970, 1977-1983



SOURCE: See Table A.13.

FIGURE 47 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN THE REGION, SOUTHERN GASPE, 1970, 1977-1983



SOURCE: See Table A.13.

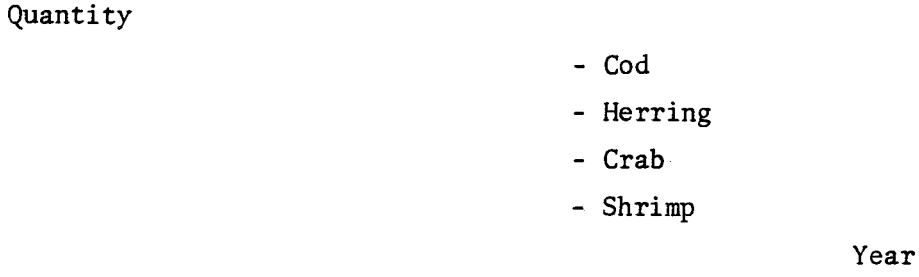
FIGURE 48 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, SOUTHERN GASPE, 1970, 1977-1983 p. 49

SOURCE: See Table A.19.

FIGURE 49 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, SOUTHERN GASPE, 1970, 1977-1983

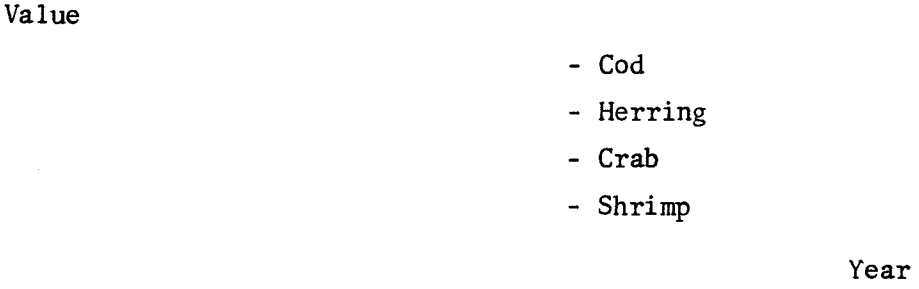
SOURCE: See Table A.19.

p. 50 FIGURE 50 LANDINGS OF MAIN SPECIES, WESTERN NORTH SHORE, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED)



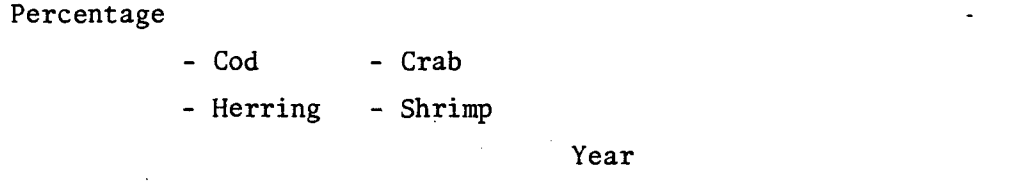
SOURCE: See Table A.7.

FIGURE 51 LANDED VALUE OF MAIN SPECIES, WESTERN NORTH SHORE, 1970, 1977-1983 (IN THOUSAND DOLLARS)



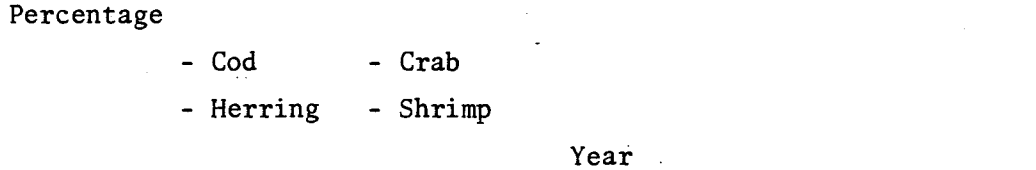
SOURCE: See Table A.7.

FIGURE 52 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN THE REGION, WESTERN NORTH SHORE, 1970, 1977-1983 p. 51



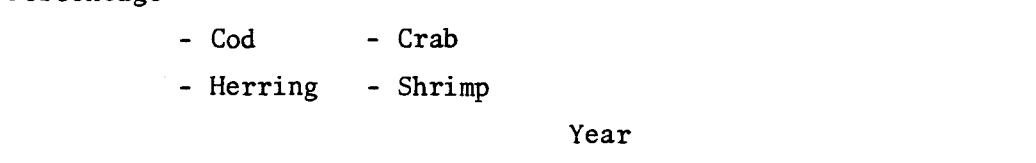
SOURCE: See Table A.14.

FIGURE 53 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN THE REGION, WESTERN NORTH SHORE, 1970, 1977-1983



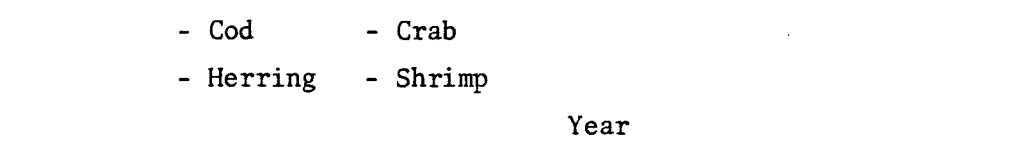
SOURCE: See Table A.14.

FIGURE 54 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, WESTERN NORTH SHORE, 1970, 1977-1983



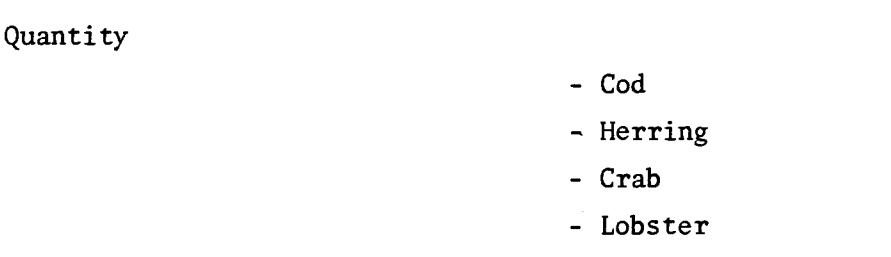
SOURCE: See Table A.20.

FIGURE 55 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, WESTERN NORTH SHORE, 1970, 1977-1983



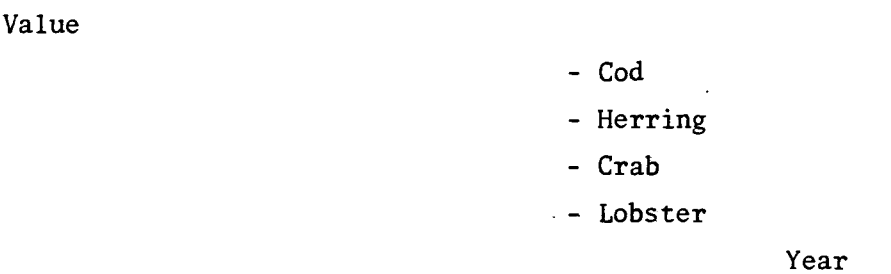
SOURCE: See Table A.20.

p. 52 FIGURE 56 LANDINGS OF MAIN SPECIES, EASTERN NORTH SHORE, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED)



SOURCE: See Table A.8.

FIGURE 57 LANDED VALUE OF MAIN SPECIES, EASTERN NORTH SHORE, 1970, 1977-1983 (IN THOUSAND DOLLARS)



SOURCE: See Table A.8.

FIGURE 58 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN THE REGION, EASTERN NORTH SHORE, 1970, 1977-1983 p. 53

Percentage

- Cod
- Herring
- Crab
- Lobster

Year

SOURCE: See Table A.15.

FIGURE 59 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN THE REGION, EASTERN NORTH SHORE, 1970, 1977-1983

Percentage

- Cod
- Herring
- Crab
- Lobster

Year

SOURCE: See Table A.15.

p. 54 FIGURE 60 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, EASTERN NORTH SHORE, 1970, 1977-1983

Percentage

- Cod
- Herring
- Crab
- Lobster

Year

SOURCE: See Table A.21.

FIGURE 61 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, EASTERN NORTH SHORE, 1970, 1977-1983

Percentage

- Cod
- Herring
- Crab
- Lobster

Year

SOURCE: See Table A.21.

FIGURE 62 LANDINGS OF MAIN SPECIES, MAGDALEN ISLANDS, 1970, 1977-1983 (IN THOUSAND METRIC TONS AS LANDED)

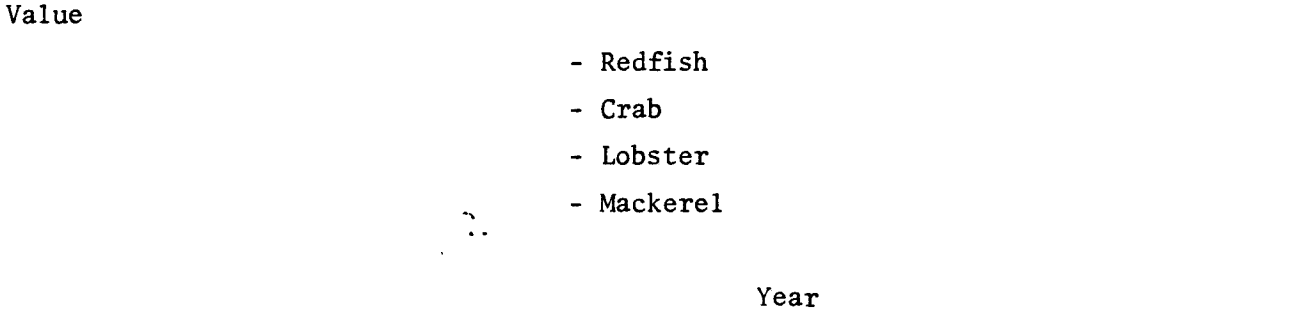
Quantity

- Redfish
- Crab
- Lobster
- Mackerel

Year

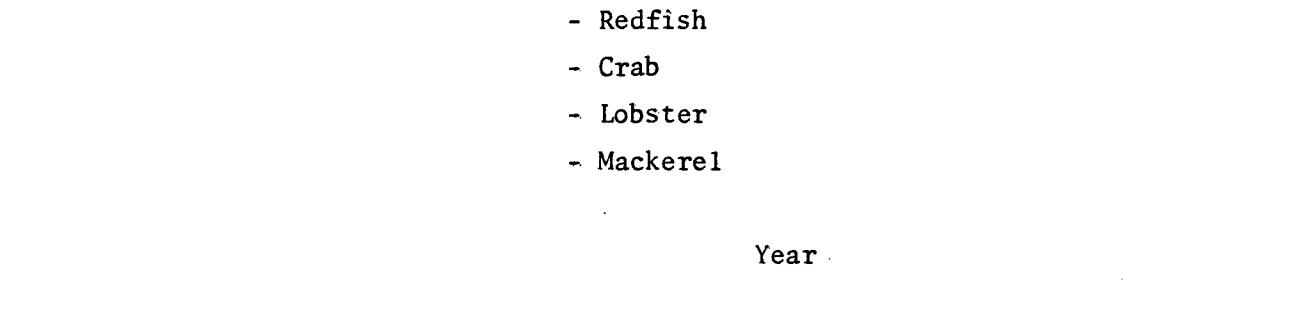
SOURCE: See Table A.9.

FIGURE 63 LANDED VALUE OF MAIN SPECIES, MAGDALEN ISLANDS, 1970, 1977-1983 p. 55
(IN THOUSAND DOLLARS)



SOURCE: See Table A.9.

FIGURE 64 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN THE REGION, MAGDALEN ISLANDS, 1970, 1977-1983

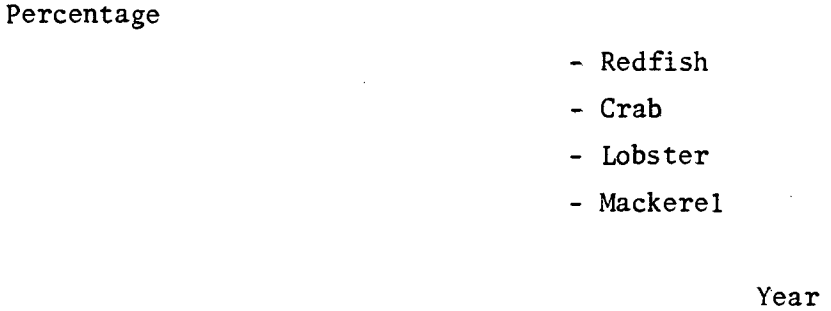


SOURCE: See Table A.16.

p. 56 FIGURE 65 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN THE REGION, MAGDALEN ISLANDS, 1970, 1977-1983

SOURCE: See Table A.16.

FIGURE 66 LANDINGS OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS IN QUEBEC, MAGDALEN ISLANDS, 1970, 1977-1983



SOURCE: See Table A.22.

FIGURE 67 LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDED VALUE IN QUEBEC, MAGDALEN ISLANDS, 1970, 1977-1983 p. 57

Percentage

- Redfish
- Crab
- Lobster
- Mackerel

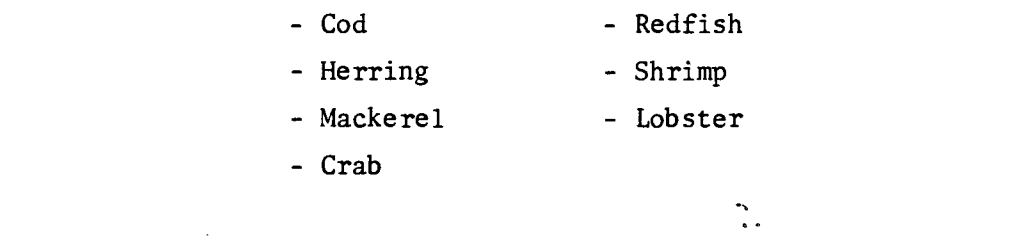
Year

SOURCE: See Table A.22.

(C) LANDED PRICES AND PRICE INDEXES

The price factor is one determinant in taking the economic pulse of an industry. In this section the landed price per kilogram will be analyzed for selected species in each of the six study regions and for Quebec as a whole. The movements in landed prices per kilogram for the period 1977-1983 will be studied in relation to three indexes, i.e., the consumer price index (CPI), the food price index and the fish price index. The fact that the price index for a given species is greater than these three indicators means that its price has outpaced inflation and the prices of the other species.

FIGURE 68 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, QUEBEC, 1977-1983
(IN CURRENT DOLLARS PER KG)



SOURCE: See Table A.23.

Quebec

The Quebec fishing industry holds a weak position in terms of international market prices. Quebec's status in world production necessarily makes it
p. 58 a passive taker of going prices, which are determined by the interplay of international supply and demand. As a result, the price per kilogram of the species landed in the province is largely unaffected by fluctuations in the Quebec industry. This notwithstanding, the statistics in Fig. 94 concerning the price per kilogram of selected species prompts a number of observations. From 1977 to 1983, for instance, shellfish scored a better performance than the other species. During the same period a strong gain is also observed in the landed price of lobster, as is the stability of prices for such species as cod, redfish, herring and mackerel. The fluctuations in the price of eel illustrate market influences (see Table A.39).

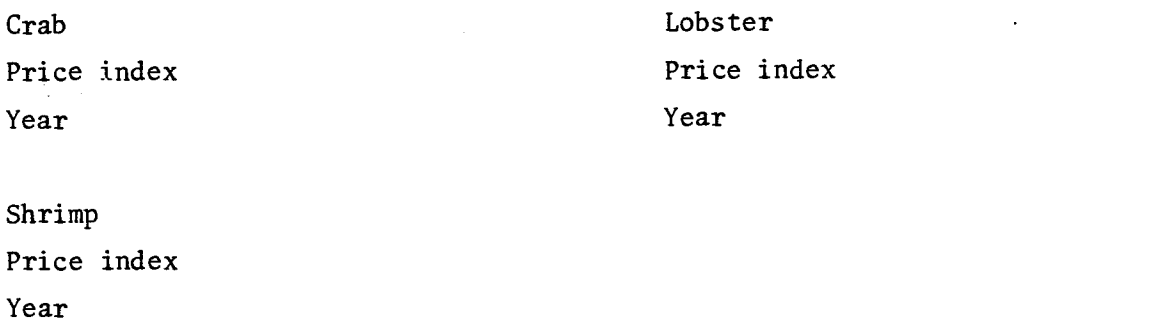
FIGURE 69 LANDED PRICE INDEXES (COD, REDFISH, HERRING AND MACKEREL), QUEBEC, 1977-1983

SOURCE: See Table A.23.

Analysis of the performance of selected species, based on their landed price indexes, confirms the strong showing of the shellfish group from p. 59 1977 to 1983 (see Fig. 70). Indeed, only the shrimp price index displayed movement comparable to that of the three general indexes. For the same period the price stability of the other species considered (cod, redfish, herring and mackerel) was a factor in the regression of their indexes relative to the three baseline indexes (see Figs. 69 and 71). Of particular note is

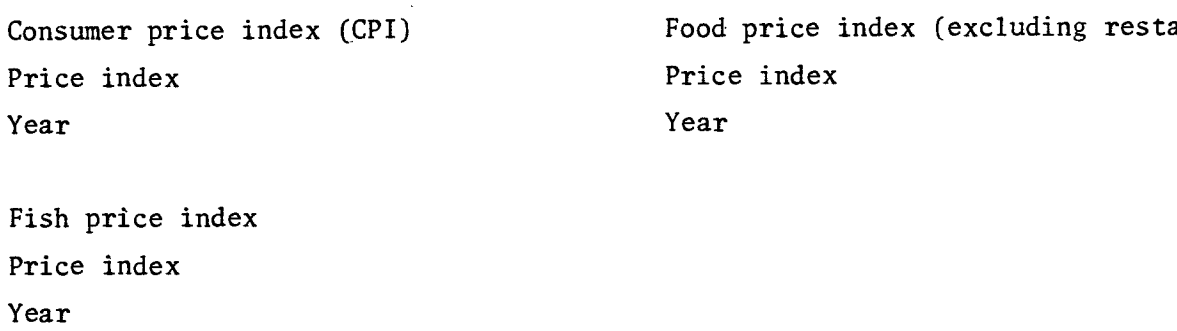
the large dip in the redfish price index relative to the fish price index from 1981 to 1983.

FIGURE 70 LANDED PRICE INDEXES (CRAB, LOBSTER AND SHRIMP), QUEBEC, 1977-1983



SOURCE: See Table A.23.

p. 60 FIGURE 71 PRICE INDEXES, QUEBEC, 1977-1983



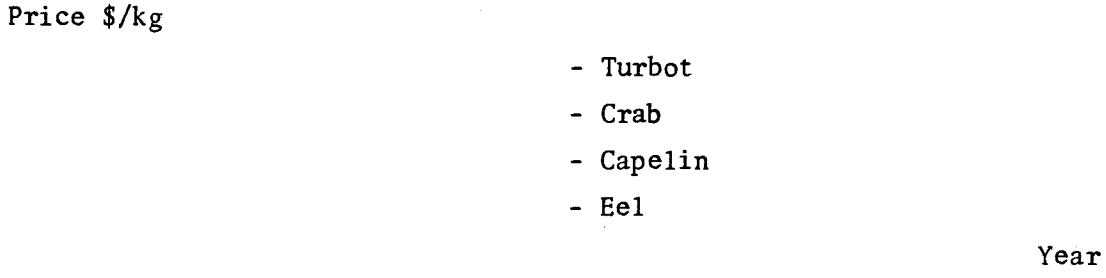
SOURCE: See Table A.23.

St. Lawrence p. 61

The movement in prices per kilogram of selected species in the region varies greatly. The eel price is marked by especially large fluctuations (see Fig. 72). In 1983 it was $2.21/kg, down from $4.61/kg in 1980. The price of turbot advanced at a steady pace (see Fig. 72). The crab price displayed the same fluctuations as prices in Quebec as a whole (see Figs. 68 and 72). During the same period the price of capelin maintained a stable but low level ($0.14/kg in 1983).

Overall, the price indexes of the main species in the region compare extremely favourably with the three general indexes. The turbot, crab and capelin indexes were higher than the fish price index and outstripped the consumer price index as well (see Figs. 71 and 73).

FIGURE 72 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, ST. LAWRENCE, 1977-1983 (IN CURRENT DOLLARS PER KG)



SOURCE: See Table A.24.

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[1] See subsection B.1: Fisheries Resources.

p. 62 FIGURE 73 LANDED PRICE INDEXES, ST. LAWRENCE, 1977-1983

SOURCE: See Table A.24.

p. 63 Northern Gaspé

The price per kilogram of shrimp in the region practically doubled during the period 1977-1983, soaring from $0.71/kg in 1977 to $1.33/kg in 1983 (see Fig. 74). Cod and redfish prices were stable during the period, amounting to $0.49/kg and $0.26/kg, respectively, in 1983. The price of sole, too, remained quite stable and was $0.30/kg in 1983.

The landed price indexes for the various species in the region reflect their economic standing. For example, the cod and redfish landed price indexes barely caught up to the three general indexes (see Fig. 75), especially after 1981. As of that same year, notwithstanding a sustained advance, the shrimp price index failed to catch up to the fish price index and barely matched the food price index (see Fig. 75).

FIGURE 74 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, NORTHERN GASPE, 1977-1983 (IN CURRENT DOLLARS PER KG)

Price $/kg

- Cod
- Redfish
- Sole
- Shrimp

Year

SOURCE: See Table A.25.

FIGURE 75 LANDED PRICE INDEXES, NORTHERN GASPE, 1977-1983 p. 64

Cod
Price index
Year

Redfish
Price index
Year

Sole
Price index
Year

Shrimp
Price index
Year

SOURCE: See Table A.25.

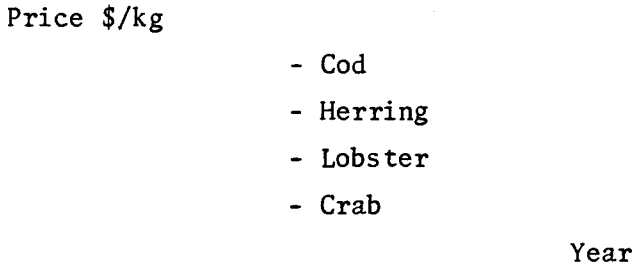
Southern Gaspé p. 65

From 1977 to 1983 the movement in the landed prices of the main species in Southern Gaspé was characterized by the high and rising price of lobster. During that period the price obtained by local fishermen was virtually always higher than the Quebec price (see Figs. 68 and 76). The crab price climbed

considerably from 1981 to 1983. From 1977 to 1983 large, regular harvests of cod and herring contributed to the stability of those species (see Fig. 76).

During the same period the crab landed price displayed the best peformance, remaining higher than the three general indexes. In spite of the rise in the price of lobster, the price index for this crustacean was lower than the three reference indexes. In the wake of encouraging signs, the herring price index was at a slightly lower level in 1981 to 1983 than those posted for the general indexes (see Figs. 71, 76 and 77).

FIGURE 76 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, SOUTHERN GASPE, 1977-1983 (IN CURRENT DOLLARS PER KG)



SOURCE: See Table A.26.

FIGURE 77 LANDED PRICE INDEXES, SOUTHERN GASPE, 1977-1983 p. 66

Cod
Price index
Year

Herring
Price index
Year

Lobster
Price index
Year

Crab
Price index
Year

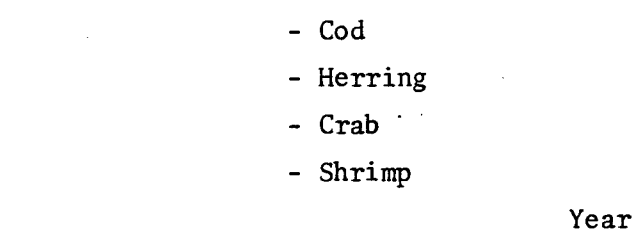
SOURCE: See Table A.26.

Western North Shore p. 67

From 1977 to 1983 crab accounted for the largest price fluctuations in the region. The price of this species dropped from $0.78/kg in 1979 to $0.59/kg in 1981. In 1983 it rose to $1.49/kg (see Fig. 78). The shrimp price ker kilogram displayed a more linear advance during the period, while the cod price remained much the same. That year cod was priced at $0.48/kg, while herring was priced at $0.37/kg.

The crab price index exhibited better results relative to the three general indexes (see Figs. 71 and 79). Herring and shrimp fishermen also derived a good income from their catches, depending on the movements of the price indexes for those species as compared to the general indexes. The price of cod barely followed the pace set by the rising prices of the other species.

FIGURE 78 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, WESTERN NORTH SHORE, 1977-1983 (IN CURRENT DOLLARS PER KG)



SOURCE: See Table A.27.

p. 68 FIGURE 79 LANDED PRICE INDEXES, WESTERN NORTH SHORE, 1977-1983

SOURCE: See Table A.27.

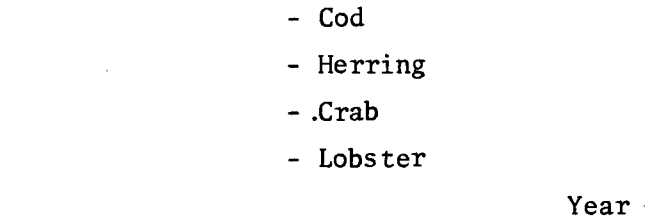
p. 69 EASTERN NORTH SHORE

The price per kilogram of lobster in the Eastern North Shore region was higher than those of cod, herring and crab. From 1977 to 1983 the lobster price fluctuated greatly before reaching $5.92/kg in 1982 and then dropping to $4.19/kg in 1983 (see Fig. 80). The crab price underwent a number of

shifts, while cod and herring prices remained relatively stable (see Fig. 80).

From 1977 to 1983 the lobster and crab landed price indexes were higher, overall, than the three general indexes (see Figs. 71 and 81). By contrast, the cod price did not move in line with those of the other species. During the period under study the herring price index was close to the reference indexes.

FIGURE 80 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, EASTERN NORTH SHORE, 1977-1983 (IN CURRENT DOLLARS PER KG)



SOURCE: See Table A.28.

p. 70 FIGURE 81 LANDED PRICE INDEXES, EASTERN NORTH SHORE, 1977-1983

Cod
Price index
Year

Herring
Price index
Year

Crab
Price index
Year

Lobster
Price index
Year

SOURCE: See Table A.28.

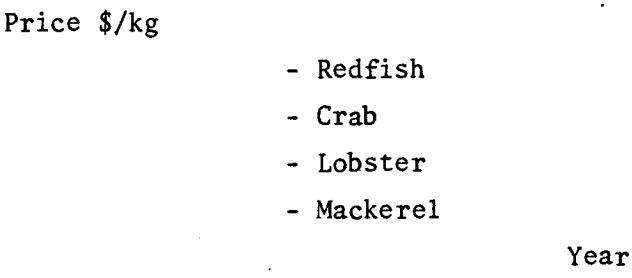
p. 71 Magdalen Islands

The movement of prices per kilogram of the main species landed in the Magdalen Islands is similar to price movements for Quebec as a whole. From 1977 to 1983 the price of redfish (landed in part in the Magdalens) remained relatively stable. In 1983 it was $0.22/kg, or $0.01/kg less than the redfish price for all of Quebec (see Figs. 68 and 82). From 1981 to 1983 the crab price in the region rose, exceeding the Quebec average. From 1977 to 1983 the regional lobster price remained slightly lower than in Quebec, for a difference of $0.03/kg to $0.30/kg.

The mackerel and redfish price indexes moved more slowly than the fish and food price indexes (see Figs. 71 and 83). Indeed, although the two species exhibited stable prices from 1977 to 1983, their performance on this count was diminished by a rise in the other fish prices and in food

prices as well. During the period the lobster and crab price indexes maintained their position relative to the three reference indexes.

FIGURE 82 MOVEMENT OF LANDED PRICES OF MAIN SPECIES, MAGDALEN ISLANDS, 1977-1983 (IN CURRENT DOLLARS PER KG)



SOURCE: See Table A.29.

FIGURE 83 LANDED PRICE INDEXES, MAGDALEN ISLANDS, 1977-1983 p. 72

SOURCE: See Table A.29.

p. 73

3. Fishermen

Undeniably, fishermen occupy an important place in the primary sector. This section will establish the number of full-time and part-time fishermen in Quebec, as well as the number of fishermen active in each of the six study regions; it will further evaluate their participation in fishing activities. The income of fishermen will be dealt with in a special part. The catching methods employed by Quebec fishermen to harvest the main species in the Gulf are described in the final part.

(A) NUMBER OF FISHERMEN, FULL-TIME AND PART-TIME FISHERMEN

The Quebec Bureau of Statistics (BSQ) defines a fisherman as any individual who catches fish for sale, with the exception of boys under 14 years old and help hired for not more than a few days.[1] Fishermen are not classed by landing sites but by place of residence. The number of fishermen varies with the definition assigned to them.

Quebec

The number of fishermen in Quebec has fluctuated considerably since 1970 (see Fig. 84). As of 1977 a cyclical trend in the fisherman work force is evident. It is graphically illustrated by peaks in 1979 and 1983 and lows in 1977 and 1980. A strong rise followed by a pronounced drop in 1979-80 could be attributed to the effects of extension of the fishing zone to

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[1] BSQ, Pêche commerciale, 1981, p. 12.

200 miles. The increase in the number of fishermen since 1980 is probably linked to economic factors. Indeed, the 1981 recession resulted in massive plant closings in the mining and forestry industries, which prompted laid-off workers to turn to fishing.

The change in the number of fishermen does not parallel that of landings. For the period 1970-1977 landings declined much more than the number of fishermen, 57% as opposed to 7% (in absolute terms). From 1980 to 1983, however, the number of fishermen marked an absolute gain of 44%, while total landings posted a net decline of 4%. This phenomenon can be explained by the introduction of strict measures to prevent overexploitation of fish stocks on the one hand and by the shift of landings to other ports on the other.

Several observations can be made with regard to the number of fishermen and the frequency of their fishing activities. There is no clear-cut distinction between full-time and part-time fishermen. Such a distinction should take account of the percentage of income derived from fishing and the time expended on fishing during the year or the season. These two factors are plotted in Fig. 85, which shows that most Quebec fishermen worked for a period ranging from six weeks to three months in 1981 and that fishing made up more than 75% of their income. Note, however, that the association which Fig. 85 suggests between fishing effort and income level

should be weighed with caution. The relationship was established in a purely arbitrary manner for the purpose of providing a composite picture of the two key factors. These two parameters will enter into the analysis of the six maritime regions.

FIGURE 84 NUMBER OF FISHERMEN, QUEBEC, 1970, 1977-1983

Number of fishermen

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.
* 1982-1983: preliminary data.

p. 74 FIGURE 85 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, QUEBEC, 1981

Number of fishermen

Percentage of income
derived from fishing 0-25% 26-75% 76-100%

Number of days

SOURCE: See Tables A.31 and A.32.

St. Lawrence

Although the St. Lawrence region has the smallest contingent of fishermen in Quebec (7.8% in 1983), it posted a steady increase in that contingent from 1979 to 1983 (see Fig. 86). During that period the proportion of

fishermen in the region relative to Quebec as a whole rose from slightly over 6% to close to 8%. However, it reached 9% in 1981 and then dropped to slightly less than 8% in 1983. Unlike Quebec as a whole, the St. Lawrence region did not witness cyclical variations in the number of fishermen.

There are two groups of fishermen in the St. Lawrence, distinguished one from the other by the number of days devoted to fishing. Most fishermen (55%) spend 100 days or less on this activity (see Fig. 87). Some in the other group (45%) spend more than 190 days a year fishing. This second group accounts for 66% of all fishermen in the province.

Although some St. Lawrence fishermen spend more than 190 days fishing, the proportion of income which they derive from this activity relative to total income remains minimal. This means that close to 64% of fishermen derive less than 25% of their income from fishing. By contrast, the corresponding figure for Quebec in 1981 was 25%, which confirms the special status of the St. Lawrence region in relation to the province.

FIGURE 86 NUMBER OF FISHERMEN IN ABSOLUTE TERMS AND AS PERCENTAGE OF TOTAL FISHERMEN IN QUEBEC, ST. LAWRENCE, 1970, 1977-1983

Number of fishermen Percentage

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.

* 1982-1983: preliminary data.

p. 75 FIGURE 87 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, ST. LAWRENCE, 1981

Number of fishermen

Percentage of income derived from fishing 0-25% 26-75% 76-100%

Number of days

SOURCE: See Tables A.31 and A.32.

Northern Gaspé

Movement in the number of fishermen in Northern Gaspé parallels that of Quebec. The region is characterized in this respect by three specific phases. The first phase, extending from 1970 to 1977, is marked by net growth of 77% in the fisherman contingent (see Fig. 88). The second, covering 1979 and 1980, suggests an absolute decline of 34%, whereas the third, extending from 1980 to 1983, shows absolute growth of close to 50% in the number of fishermen compared to 1980. Given the considerable importance of this region in Quebec's sea fisheries industry, its statistical profile resembles that of Quebec as a whole on several counts.

Most fishermen in the region (58%) spend 10 to 20 weeks fishing (see Fig. 89). The length of the fishing season appears to be about the same for all fishermen in the region given that only 4% devote more than 23 weeks to fishing. As regards the fishing effort, the region's fishermen form a fairly homogeneous group.

Fishing accounts for an appreciable portion of total income in this part of the peninsula. Forty-five per cent of fishermen earn more than 75% of their total income from fishing. In addition, 43% of them earn 25 to 75% of their total income from fishing, in spite of the fairly short season, which normally lasts less than 20 weeks.

FIGURE 88 NUMBER OF FISHERMEN IN ABSOLUTE TERMS AND AS PERCENTAGE OF TOTAL FISHERMEN IN QUEBEC, NORTHERN GASPE, 1970, 1977-1983

Number of fishermen Percentage

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.

* 1982-1983: preliminary data.

FIGURE 89 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, NORTHERN GASPE, 1981 p. 76

Number of fishermen Percentage of income derived from fishing 0-25% 26-75% 76-100%

Number of days

SOURCE: See Tables A.31 and A.32.

Southern Gaspé

Southern Gaspé is among the regions with the largest contingent of fishermen.

The proportion of regional fishermen to the Quebec total is steadily declining, although still quite substantial. It fell from 33% in 1977 to 21% in 1980, or from about 1,500 to 1,000 fishermen. This was later followed by a new upswing that resulted in 1,288 fishermen in 1983. Fig. 90 shows that, in spite of the increase in the number of fishermen posted from 1980 on, the ratio of the region to the province marked a steady decline.

The number of days spent fishing is much the same as in Northern Gaspé. More than half of fishermen devote 10 to 23 weeks to this activity; one very small group (under 2% of the total) spends more than 23 weeks (see Fig. 91). This similarity between the two regions of the Gaspé is no doubt attributable to their proximity and the fishing area.

Southern Gaspé fishermen do not look solely to fishing for a decent income. A little more than 40% of them derive 75% of their overall income from fishing, while slightly less than 20% derive nearly one-fourth of their overall income from this activity.

p. 77 FIGURE 90 NUMBER OF FISHERMEN IN ABSOLUTE TERMS AND AS PERCENTAGE OF TOTAL FISHERMEN IN QUEBEC, SOUTHERN GASPE, 1970, 1977-1983

Number of fishermen Percentage

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.

* 1982-1983: preliminary data.

FIGIRE 91 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, SOUTHERN GASPE, 1981

Number of fishermen	Percentage of income derived from fishing	0-25%	26-75%	76-100%
		Number of days		

SOURCE: See Tables A.31 and A.32.

Western North Shore

The movement in the number of Western North Shore fishermen differs from that of Quebec as a whole. From 1980 to 1983 this region, like Quebec, witnessed strong growth (see Fig. 92) From 1970 to 1980, however, there was a marked decline in the number of fishermen in the region, as opposed to certain signs of improvement in the province (see Fig. 84). Notwithstanding the decline in the number of fishermen from 1970 to 1980, that number rose from 1980 to 1983. Owing to that growth, the Western North Shore gained a little more than six points on the provincial scale.

The Western North Shore fishery extends over a short period of time: more than three-fourths of local fishermen (78%) fish less than 13 weeks a season (see Fig. 93). The others spend 91 to 200 days fishing.

p. 78 FIGURE 92 NUMBER OF FISHERMEN IN ABSOLUTE TERMS AND AS PERCENTAGE OF TOTAL FISHERMEN IN QUEBEC, WESTERN NORTH SHORE, 1970, 1977-1983

Number of fishermen Percentage

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.
* 1982-1983: preliminary data.

FIGURE 93 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, WESTERN NORTH SHORE, 1981

Number of fishermen

Percentage of income derived from fishing 0-25% 26-75% 76-100%

Number of days

SOURCE: See Tables A.31 and A.32.

Although most fishermen earn less than 25% of their income from fishing, two groups stand out in terms of fishing income. Fishermen earning less than 25% of their income from this activity account for 57% of the total; those earnings 75% make up close to a third (32%) of the total. The figures for the number of days devoted to fishing and the percentage of income derived from fishing in 1981 confirm that fishing was a secondary activity for the fishermen in the region.

Eastern North Shore

The number of Eastern North Shore fishermen relative to total fishermen remained fairly stable from 1977 on (see Fig. 94). Following an increase from 1970 to 1977, the absolute proportion dropped slightly and then rose. In spite of this backward movement, the region managed to maintain about the same percentage ratio of local to provincial fishermen. The absolute number of fishermen fluctuated considerably from 1970 to 1983, finally showing net growth of close to 50% from 1980 to 1983.

The number of fishing days in this region varies considerably from one fisherman to another. Some (40%) fish one to eight weeks. However, most of them (51%) fish 10 to 17 weeks. A very small proportion (1.0%) fish 20 weeks.

While the Eastern North Shore fishing season appears to match that of Southern Gaspé, half of local fishermen (50.3%) derive upwards of 75% of their income from fishing, as opposed to 41% in Southern Gaspé. The p. 79 difference between the two regions falls in an intermediate range where fishermen derive 25 to 75% of their income from fishing. Close to 40% of Southern Gaspé fishermen fall in this category; the corresponding figure for the Eastern North Shore is 17%.

FIGURE 94 NUMBER OF FISHERMEN IN ABSOLUTE TERMS AND AS PERCENTAGE OF TOTAL FISHERMEN IN QUEBEC, EASTERN NORTH SHORE, 1970, 1977-1983

Number of fishermen Percentage

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.

* 1982-1983: preliminary data.

FIGURE 95 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, EASTERN NORTH SHORE, 1981

Number of fishermen Percentage of income derived from fishing 0-25% 26-75% 76-100%

Number of days

SOURCE: See Tables A.31 and A.32.

Magdalen Islands

In spite of a sharp decline in the number of fishermen from 1970 to 1977, i.e., down from 1,278 to 884 (see Fig. 96), the Magdalens claim the same one-fourth of Quebec fishermen as in 1981. In 1983, however, despite a steady increase in the number of fishermen, that proportion slipped under 20%. This shows that the increase in the number of Magdalen Island fishermen was not as strong as in Quebec as a whole.

The Magdalen Islands region differs from the other regions in terms of the number of days devoted to fishing. Most local fishermen crowd their activities into several weeks owing to the short duration of the lobster fishing season.

More than three-fourths of them fish six to 15 weeks (see Fig. 97). A few (1.0%) spend six months fishing. p. 80

Despite a relatively short season, the Magdalens have the highest proportion of fishermen who live almost exclusively from fishing. What is more, close to 82% of them earn 75 to 100% of their income from fishing. Thus, the Magdalens are one of the regions of Quebec where fishermen can live from this activity.

FIGURE 96 NUMBER OF FISHERMEN IN ABSOLUTE TERMS AND AS PERCENTAGE OF TOTAL FISHERMEN IN QUEBEC, MAGDALEN ISLANDS, 1970, 1977-1983

Number of fishermen Percentage

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 5; 1977-1981: tab. 6.

* 1982-1983: preliminary data.

FIGURE 97 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING AND PERCENTAGE OF INCOME DERIVED FROM FISHING, MAGDALEN ISLANDS, 1981

Number of fishermen	Percentage of income derived from fishing	0-25%	26-75%	76-100%
		Number of days		

SOURCE: See Tables A.31 and A.32.

(B) FISHERMAN INCOME

Table 5 gives the distribution of the various components that made up the average income of the Quebec fisherman in 1979, 1980 and 1981. It is based essentially on the fisherman sampling conducted by the Quebec Department of Revenue, and the figures therefore indicate trends rather
p. 81 than actual facts. For, as with farmers, it is difficult to determine the real income level of fishermen.[1] The problems in this regard relate, among other things, to the dual status of fishermen who own their own vessels as both contractors and "specialized workers." This complicates efforts to comment upon a fisherman's "average disposable income," which amounted to $8,900 on 1981. One method entails comparing the income of Quebec fishermen with that of fishermen in eastern Canada. The Atlantic Fisheries Study Group provides similar information which, however, pertains solely to the four Atlantic provinces.

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[1] Owing to the input from family allowances and problems of taking full inventory of income and expenses.

TABLE 5 AVERAGE INCOME OF QUEBEC FISHERMEN, 1979, 1980 AND 1981

	1979	1980	1981
(1) Average net income from fishing			
(2) Average UI benefits			
(3) Other income			
(4) Average total pre-tax income (= 1 + 2 + 3)			
(5) Average total exemptions and deductions			
(6) Average taxable income (= 4 - 5)			
(7) Average provincial income tax			
(8) Average federal income tax			
(9) Average total income tax (= 7 + 8)			
(10) Average disposable income (= 4 - 9)			

SOURCE: Quebec Department of Revenue, Statistiques fiscales des particuliers (federal income tax: "tax statistics").

Explanation of items in Table 5: Average Income of Quebec Fishermen

(1) The number of fishermen used to calculate average net income from fishing comprises all fishermen who have filed an income tax return in which the chief source of income is fishing and net income is not zero. They numbered as follows:

1979: 1,933

1980: 1,472

1981: 2,275

(2) The number of fishermen used to calculate average unemployment insurance benefits comprises those who have filed an income tax return and received UI benefits.

(3) This item represents the balance of "total pre-tax income" minus "net income from fishing" minus "UI benefits." The "average total pre-tax income" was:

1979: $9,582.30

1980: $13,229.80

1981: $10,982.83

(4) The number of fishermen used to calculate "average total pre-tax income" comprises all fishermen who have filed an income tax return and pursue fishing as their chief source of income. They numbered as follows:

1979: 2,023

1980: 1,510

1981: 2,330

(5) This item represents the difference between "average total pre-tax income" and "average taxable income."

(6) The number of fishermen used to calculate "average taxable income" comprises all fishermen who have filed an income tax return, pursue fishing as their chief source of income and have taxable income. They numbered as follows:

1979: 1,579

1980: 1,491

1981: 1,701

(7) The number of fishermen used to calculate provincial income tax comprises those who have filed an income tax return, pursue fishing as their chief source of income and have taxable income. They numbered as follows:

1979: 1,581

1980: 1,510

1981: 1,708

(8) Source: Revenue Canada, Statistical Services Division, Returns by Occupation and Province.

The number of fishermen used to calculate federal income tax comprises those who have filed a federal income tax return, pursue fishing as their chief source of income and have taxable income. They numbered as follows:

1979: 2,346

1980: 2,267

1981: 2,364

---

p. 82 TABLE 6 AVERAGE NET ANNUAL PRE-TAX INCOME OF FISHERMEN IN THE ATLANTIC PROVINCES AND QUEBEC, 1981[1]

	Atlantic Fishermen		Quebec Fishermen	
	Full-time	Part-time	Full-time	Part-time
Net income from fishing				
Net income from other sources				
Total				

SOURCE: 1982 Atlantic Fisheries Study Group, Naviguer dans la tourmente: une nouvelle politique pour les pêches de l'Atlantique, Ottawa, Canadian Government Printing Centre, pp. 55-56.

(C) FISH CATCHING METHODS

The choice of fishing methods is tied to a number of factors, such as environment, habitat of the various species and type of vessel. Use of the various fishing gear varies with the fishing region. This brief section presents the fishing methods used across Quebec.

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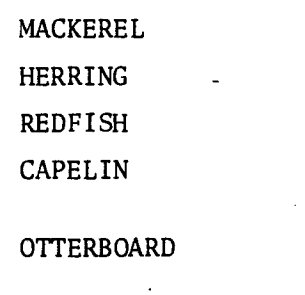
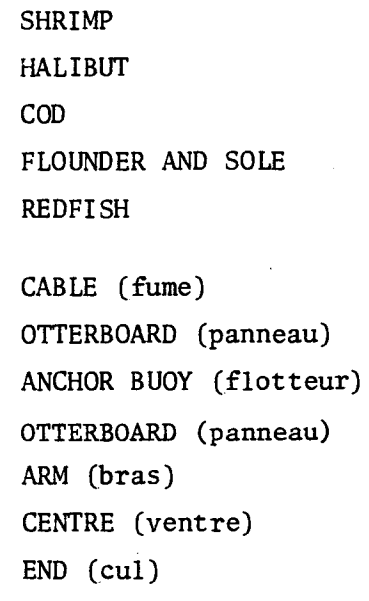
[1] For details on the methods used to catch the various species, consult Section B.1: Fisheries Resources.

FIGURE 98 SEMI-PELAGIC TRAWL



SOURCE: M. Levasseur (1982).

FIGURE 99 BOTTOM TRAWL



SOURCE: M. Levasseur (1982).

FIGURE 100 GILLNET

MACKEREL
SMELT
SALMON (drift gillnet)
HALIBUT
COD
HERRING
TURBOT

BOYU (bouée)
BUOYS (bouées)
NET (filet)
ANCHOR (ancre)

FIGURE 101 LONGLINE

HALIBUT
COD

BUOY (bouée)
ANCHOR (ancre)
HOOK (hameçon)

SOURCE: M. Levasseur (1982).

FIGURE 102 WEIR FISHING

p. 83

CAPELIN
HERRING
SHAD
STURGEON

WEIR (port de pêche)
POLES (arrête)
SHORELINE (côte)

SOURCE: M. Levasseur (1982).

FIGURE 103 EEL FISHING

SHORE (rive)
FLUME (entonnoir)
LEADER (coffe)

SOURCE: M. Levasseur (1982).

FIGURE 104 COD TRAP (LOWER NORTH SHORE)

CORK ANCHOR BUOYS (flotteurs de liège)
DOOR (porte)
LEADER (guide)
INTERNAL ANCHOR (amarrage intérieur)
WEIGHTS (plombs)
EXTERNAL ANCHOR (ammarage extérieur)

SOURCE: M. MOUSSETTE (1978).

Given the importance of groundfish in total landings in Quebec, trawls and gillnets are the gear most commonly used on-vessels under 10 tons. The number of vessels equipped with trawls remained steady from 1977 to 1983 as a quota had been imposed on licensing.

Gillnetting, which became popular in Quebec in the late 1960s, sparked renewed interest in 1980 owing to the development of the inshore fishery. Longlining is another traditional method that attracted a number of inshore

fishermen. The growing popularity of this method is linked to the use of automatic baiters, which make it possible to spread more lines, at the same time considerably accelerating and reducing the crew's workload.

p. 84 TABLE 7 FISHING METHOD* OF VESSELS 10 TONS AND OVER, QUEBEC, 1979, 1981 AND 1983

Fishing method	1979	1981	1983
Trawl			
Gillnet			
Longline			
Scallop dragger			
Pelagic trawl			
Crab trap[1]			
Other			

* N.B. A fisherman may declare more than one fishing method per vessel.

[1] Compiled from 1981 on.

SOURCE: BSQ, Pêche commerciale, 1979, 1981, 1983.

FIGURE 105 HANDLINE

(1) for mackerel fishery (2) Jigger (cod)

SOURCE: A.V. Brandt (1972), Fish Catching Methods of the World.

FIGURE 106 LOBSTER TRAP

FIGURE 107 WHELK CAGE

SOURCE: Fontaine et al. (1981).

FIGURE 108 SNOW CRAB TRAPS p. 85

(1) RECTANGULAR TRAP

BUOY (bouée)
SHOTTED LINE (cable plombé)
TRAP (casier)
DOOR NET (filet de l'entrée)
DOOR (entrée)
BOTTOM WEBBING (maillage du fond)
SIDE WEBBING (maillage du côté)
POLYPROPYLENE NETTING

(2) CONICAL TRAP

BUOY (bouée)
SHOTTED LINE (cable plombé)
TRAP (casier)
ANCHOR (ancre)

SOURCE: M. Levasseur (1982).

FIGURE 109 SCALLOP DRAGGER

DRAG (drague)

Drag rope (fune)

ACCORDING TO FONTAINE ET AL. (1981)

p. 86 FIGURE 110 SALMON TRAP NET (CHALEUR BAY)

FIGURE 111 SHORE-ANCHORED SALMON GILLNET

COASTLINE (côte)
LINE (ligne)
NETTING (filet)
BUOY (bouée)
ANCHOR (ancre)
BUOY (bouée)
ANCHOR BUOYS (flotteurs)
SURFACE WATER (eau de surface)
SURFACE WATER (eau de surface)
BED (fond)
SEA OR RIVER BED (fond marin ou rivière)

SOURCE: R.W. Dunfield, Types of Commercial Salmon Fishing Gear in the Maritime Provinces - 1971 (Environment Canada).

FIGURE 112 SEAL FISHING p. 87

(A) SHOAL NET (charnette)
BUOYS, BOTTOM HOOKS (bouées, grappins au fond)

(B) FISHING
NETTING (filet)
LINES (câbles)
ANCHOR BUOYS (flotteurs)
DIRECTION OF SEALS (direction des phoques)
COASTLINE (côte)

SOURCE: Canadian Hydrographic Service Chart (No 4469).

4. Fleet p. 88

This section profiles the current status of the fishing fleet in terms of commercial vessels in the maritime regions of Quebec. It is divided into three parts which present all available information on the fleet, i.e., vessels, financial data and fleet modernization.

(a) Vessels
i. Capacity and length
ii. Age and year of construction
iii. Crews

(b) Value and investment
i. Value of vessels
ii. Vessel investment and gear expenditure

(c) Fleet modernization

i. Hull construction materials

ii. Fuel consumption

iii. Electronic equipment

iv. On-board quality control

Subsections (a) and (b) present data for both Quebec and the six regions. However, the information on vessel crews and value will be presented in the aggregate. Subsection (c) pertains to the Quebec maritime area as a whole.

(A) VESSELS

i. Capacity and Length

The capactiy of a vessel is proportional to that of its hold and is measured in tons (100 cubic feet) of gross tonnage. Vessel length designates the overall length from bow to stern.

Quebec

Figs. 113 and 114 illustrate the present status of Quebec's fishing fleet. There was little fluctuation in the total complement of vessels from 1977 to 1981. But 1982 and 1983 saw successive increases of 18% and 26% (see Table A.34).

FIGURE 113 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, QUEBEC, 1970, 1977 AND 1983

Percentage

under 7.6 m (under 25')
7.6 m - 10.5 m (25' - 34'11")
10.6 m - 13.6 m (35' - 44'11")
13.7 m - 19.7 m (45' - 64'11")
19.8 m - 30.4 m (65' - 99'11")
30.5 m and over (100' and over)

Year
Length

SOURCE: See Table A.42.

For the period 1970-1983 changes occurred within the various length and tonnage classes. The most significant change was in the intermediate size and tonnage categories, i.e., 35 feet to 44.11 feet (10.6 m to 13.6 m) and 10 to 25 tons. These categories comprised 4% of Quebec vessels in 1970 but stood at 10% in 1983 (see Figs. 113 and 114). p. 89

FIGURE 114 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, QUEBEC, 1970 1977 AND 1983

Percentage

under 10.0
10.0 to 24.9
25.0 to 49.9
50.0 to 99.9
100.0 to 149.9
150 and over

Year

Tons

SOURCE: See Table A.50.

The most common cut-off for differentiating between inshore and offshore vessels is 25 gross tons or 45 feet of overall length. In addition, trawlers are often compared with draggers. Quebec trawlers are all offshore vessels, while draggers are essentially inshore craft.

With the exception of seven units, vessels over 100 feet (30.5 m) in length engaged in the redfish fishery have left the Gulf owing to the decline in catches and the 1976 quota.

p. 90 St. Lawrence

From 1970 to 1983 the St. Lawrence region claimed a stable percentage of total vessels in Quebec (2 to 3%) (see Fig. 115). Most of the fleet (74%) was comprised of vessels under 25 feet (7.6 m), including non-motorized craft.

In 1970 non-motorized craft accounted for 54% of the regional fleet. In 1983 that figure had fallen to only 13% (see Table A.42).

Vessel capacity is generally small. In 1983 only 9% had a hold capacity of more than 10 tons. Since 1970, however, there have been more vessels in this class (see Fig. 117). The large proportion of small craft in the

region bears out the inshore nature of local fisheries.

FIGURE 115 NUMBER OF VESSELS AND PROPORTION RELATIVE TO QUEBEC, ST. LAWRENCE, 1970, 1977-1983

Number of vessels

Percentage

- Number
- Proportion

Year

SOURCE: See Table A.41.

FIGURE 116 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, ST. LAWRENCE, 1970, 1977 AND 1983

(same text as Fig. 113)

SOURCE: See Table A.42.

FIGURE 117 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, ST. LAWRENCE, 1970, 1977 AND 1983 p. 91

(same text as Fig. 114)

SOURCE: See Table A.50.

Northern Gaspé

The number of vessels in Northern Gaspé fluctuated considerably from 1970 to 1983 (see Fig. 118). The changes affected the composition of the fleet.

A shift to larger vessels was in evidence from 1970 to 1980, particularly in the class of vessels measuring 45 feet to 64.11 feet (13.7 m to 19.7 m), with the proportion relative to all vessels rising from about 8% to 14% (see Fig. 119).

In 1983, 84% of all vessels in the region had a hold capacity under 10 tons. The other vessels were distributed equally among the classes of vessels over 10 tons.

FIGURE 118 NUMBER OF VESSELS AND PROPORTION RELATIVE TO QUEBEC, NORTHERN GASPE, 1970, 1977-1983

Number of vessels

Percentage

- Number
- Proportion

Year

SOURCE: See Table A.41.

p. 92 FIGURE 119 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, NORTHERN GASPE, 1970, 1977 AND 1983

(same text as Fig. 113)

SOURCE: See Table A.42.

FIGURE 120 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, NORTHERN GASPE, 1970, 1977 AND 1983

(same text as Fig. 114)

SOURCE: See Table A.50.

Southern Gaspé p. 93

While there was considerable fluctuation in the number of vessels in Southern Gaspé from 1970 to 1983, the proportion relative to all vessels in Quebec remained virtually constant at close to 20% (see Fig. 121). During that period most vessels (more than 50%) in the region were under 25 feet (7.6 m) in length (see Fig. 122). But more use was made of larger vessels. From 1970 to 1983, for instance, the proportion of local vessels measuring 25 feet to 34.11 feet (7.6 m to 10.5 m) doubled.

In 1983 more than 20% of the vessels had a hold capacity over 10 tons. That year the number of vessels in this class rose slightly over 1970 (see Fig. 123).

FIGURE 121 NUMBER OF VESSELS AND PROPORTION RELATIVE TO QUEBEC, SOUTHERN GASPE, 1970, 1977-1983

Number of vessels

Percentage

- Number
- Proportion

Year

SOURCE: See Table A.41.

FIGURE 122 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, SOUTHERN GASPE, 1970, 1977 AND 1983

(same text as Fig. 113)

SOURCE: See Table A.42.

p. 94 FIGURE 123 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, SOUTHERN GASPE, 1970, 1977 AND 1983

(same text as Fig. 114)

SOURCE: See Table A.50.

Western North Shore

The period 1977 to 1983 saw a very strong increase in the number of vessels in the Western North Shore, 700 up from 300. In 1983 the region thus accounted for close to 20% of the Quebec fishing fleet. Apparently, that gain also affected the composition of the fleet in terms of length, for an increase is noted in the number of vessels of 25 feet to 44.11 feet (7.6 m to 13.6 m) (see Fig. 125). In 1970 they made up 3% of the regional total, whereas in 1983 that figure reached 14%. On the other hand, there were very few vessels of more than 65 feet (19.8 m).

In 1983 nearly all vessels in the region (more than 99%) were under 25 tons (see Fig. 126).

FIGURE 124 NUMBER OF VESSELS AND PROPORTION RELATIVE TO QUEBEC, WESTERN NORTH SHORE, 1970, 1977-1983

Number of vessels

Percentage

- Number
- Proportion

Year

SOURCE: See Table A.41.

FIGURE 125 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, WESTERN NORTH SHORE, 1970, 1977 AND 1983 p. 95

(same text as Fig. 113)

SOURCE: See Table A.42.

FIGURE 126 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, WESTERN NORTH SHORE, 1970, 1977 AND 1983 p. 96

(same text as Fig. 114)

SOURCE: See Table A.50.

Eastern North Shore

Although the Eastern North Shore seemed by far the most important region in terms of percentage of the Quebec fleet (more than one-fourth in 1983), the number of vessels in the region relative to that in Quebec as a whole

dropped from 40% in 1977 to 26% in 1983 (see Fig. 127). From 1980 to 1983, however, the number of vessels reached 956. Major changes have occurred in vessel size in the past ten years. In 1983 there were many more medium-size vessels (25 to 44.11 feet, or 7.6 m to 13.6 m), which accounted for more than 35% of the regional total. From 1977 to 1983 there was a remarkable decline in the number of vessels measuring 25 feet (7.6 m) (see Fig. 128).

Over the period 1970-1983 the Eastern North Shore fishery was mainly an inshore fishery using vessels under 25 tons. This class accounted for upwards of 99% of the regional total (see Fig. 129).

FIGURE 127 NUMBER OF VESSELS AND PROPORTION RELATIVE TO QUEBEC, EASTERN NORTH SHORE, 1970, 1977-1983

Number of vessels

Percentage

- Number
- Proportion

Year

SOURCE: See Table A.41.

p. 97 FIGURE 128 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, EASTERN NORTH SHORE, 1970, 1977 AND 1983

(same text as Fig. 113)

SOURCE: See Table A.42.

FIGURE 129 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, EASTERN NORTH SHORE, 1970, 1977 AND 1983 p. 98

(same text as Fig. 114)

SOURCE: See Table A.50.

Magdalen Islands

The number of vessels in the Magdalen Islands region remained fairly stable from 1970 to 1983 (see Fig. 130). By contrast, the size of the regional fleet relative to that of Quebec declined substantially after 1980, dropping from slightly less than 20% in 1980 to 13% in 1983.

The composition of the regional fleet by length class differs from that of the other regions. While in 1983 the main vessels in the other regions measured under 25 feet (7.6 m), the class of 25 feet to 35.11 feet (7.6 m to 10.5 m) claimed the largest share of vessels in the Magdalens (see Fig. 131). From 1970 to 1983 larger vessels were used, especially those measuring from 35 feet to 44.11 feet (10.6 m to 13.6 m).

Unlike in the other regions, the vessels in the Magdalens are more evenly distributed by tonnage class. In 1983, 34% of the vessels were 10 tons and over (see Fig. 132). The region also has the largest number of very large vessels (150 tons and over). The geographical location of the region plays a part in the composition of its fleet.

FIGURE 130 NUMBER OF VESSELS AND PROPORTION RELATIVE TO QUEBEC, MAGDALEN ISLANDS, 1970, 1977-1983

Number of vessels

Percentage

- Number
- Proportion

Year

SOURCE: See Table A.41.

p. 99 FIGURE 131 PERCENTAGE DISTRIBUTION OF VESSELS BY LENGTH, MAGDALEN ISLANDS, 1970, 1977 AND 1983

(same text as Fig. 113)

SOURCE: See Table A.42.

p. 100 FIGURE 132 PERCENTAGE DISTRIBUTION OF VESSELS BY TONNAGE, MAGDALEN ISLANDS, 1970, 1977 AND 1983

(same text as Fig. 114)

SOURCE: See Table A.50.

ii. Age and Year of Construction

The age of a fleet is determined by the year of construction of its vessels. This section pertains solely to vessels measuring 35 feet (10.6 m) and over. The fleet is subdivided into three length classes: 35 to 44.11 feet

(10.6 m to 13.5 m), 45 to 59.11 feet (13.7 m to 18.2 m) and 60 feet (18.3 m) and over.

Quebec

The age of the Quebec fleet in 1984 is graphically represented in Fig. 133. It should be noted that the useful life of a fishing boat varies with the hull construction materials (wood, fiberglass, aluminum or steel), the type of construction (butt-jointed wood hull or edge-nail hull) and the fish catching method and site. A vessel has a life of about 15 years at worst and 40 years at best.

A little more than 30% of the vessels measuring 35 feet (10.6 m) and over were built before 1970. Thus, close to a third of the fleet will have to be renewed over the next years.

Analysis by length class reveals that the relatively young vessels are 35 to 44.11 feet (10.6 m to 13.6 m). In 1984 nearly 60% of them were under 10 years old. Vessels in the medium-size class (45 to 59.11 feet) are nearly all the same age (see Table A.58); close to 40% of them were built within the past 10 years. The oldest vessels are those measuring 60 feet (18.3 m) and over; close to 50% were 15 years old and over in 1984.

St. Lawrence

Although there are only a few vessels (12) of 35 feet (10.6 m) and over in the St. Lawrence region, the fishing fleet is relatively young. Of all vessels 35 feet (10.6 m) and over, seven were built within the past 10 years (see Fig. 134).

In the 35 to 44.11 foot (10.6 m to 13.6 m) class, six out of eight vessels are under 10 years old. Of the four vessels measuring 45 to 59.11 feet (13.7 to 18.2 m), two were built more than 24 years ago (see Table A.58).

p. 101 FIGURE 133 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, QUEBEC, 1984

Percentage

before 1960 (over 24 yrs)
1960 - 1964 (20 - 24 yrs)
1965 - 1969 (15 - 19 yrs)
1970 - 1974 (10 - 14 yrs)
1975 - 1979 (5 - 9 yrs)
1980 and after (4 yrs and under)

Year

SOURCE: See Table A.51.

FIGURE 134 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, ST. LAWRENCE, 1984

(same text as Fig. 133)

SOURCE: See Table A.52.

Northern Gaspé p. 102

The Northern Gaspé fleet claims a notably large proportion (more than 40%) of the vessels over 15 years old (see Fig. 135). However, an equally large proportion (nearly 45%) are under 10 years old, which reflects the effort to renew the fleet.

The vessels exhibiting the greatet signs of aging are 60 feet (18.3 m) and over. Half of the vessels in this class were built more than 14 years ago (see Table A.58). The newest vessels (under 10 years old) measure 35 to 44.11 feet (10.6 m to 13.6 m). This class comprises 46% of the regional fleet.

FIGURE 135 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, NORTHERN GASPE, 1984

(same text as Fig. 133)

SOURCE: See Table A.53.

Southern Gaspé

The age of the Southern Gaspé fleet closely parallels that of the Quebec fleet as a whole (see Figs. 133 and 136). A like proportion of vessels were built within the past ten years (48% in the region as compared to 51% in the province). In addition, vessels more than 14 years old account for 35% of the regional fleet, as compared to 31% of the provincial fleet.

Vessels 60 feet (18.3 m) and over in length are the oldest: 45% of them were built more than 14 years ago. The 45 to 59.11 foot (13.7 m to 18.2 m) class makes up 42% of the regional fleet. Half of the vessels measuring 35 to 44.11 feet (10.6 m to 13.6 m) are less than 10 years old.

p. 103 FIGURE 136 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, SOUTHERN GASPE, 1984

(same text as Fig. 133)

SOURCE: See Table A.54.

Western North Shore

The Western North Shore fleet is relatively young, more than half of the vessels having been constructed after 1974. In 1984 it included seven vessels more than 24 years old (see Fig. 137).

Sixty per cent of the vessels in the 35 to 44.11 foot (10.6 m to 13.6 m) class are under 10 years old. This class comprises the largest number of vessels overall. A third of the vessels built before 1960 measure 45 to 59.11 feet (13.7 m to 18.2 m) in length. Only three out of a total of 15 are under 10 years old (see Table A.58).

Eastern North Shore

The Eastern North Shore is without doubt the only region that is not faced with the problem of an aging fleet: 82% of the vessels 35 feet (10.6 m) and over were built after 1974. The corresponding proportion for Quebec is 51% (see Figs. 133 and 138).

Most of the Eastern North Shore fleet is comprised of vessels 35 to 44.11 feet (10.6 to 13.6 m) long; 90% of them were built within the past 10 years (see Table A.58), whereas 75% of vessels 45 feet (13.7 m) long were constructed more than 10 years ago.

Magdalen Islands

Overall, the Magdalen Islands fleet has no serious aging problems. Close to 45% of vessels in the region are under 10 years old (see Fig. 139). On the other hand, more than a fourth of them were built 15 years ago or more.

The largest vessels (60 feet, or 18.3 m, and over) are the part of the fleet in need of replacement; 92% of the vessels in this class are more

than 10 years old. The majority of vessels 35 to 44.11 feet (10.6 m to 13.6 m) long were built within the past 10 years (see Table A.58).

p. 104 FIGURE 137 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, WESTERN NORTH SHORE, 1984

(same text as Fig. 133)

SOURCE: See Table A.55.

p. 105 FIGURE 138 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, EASTERN NORTH SHORE, 1984

(same text as Fig. 133)

SOURCE: See Table A.56.

p. 106 FIGURE 139 PERCENTAGE DISTRIBUTION OF VESSELS 35 FEET (10.5 m) AND OVER BY YEAR OF CONSTRUCTION, MAGDALEN ISLANDS, 1984

(same text as Fig. 133)

SOURCE: See Table A.58.

iii. Crews

The size of the crew varies with vessel size and type of fishery.

The crew of inshore fishing vessels generally comprises two to three members. However, the size of the crew depends on the amount of work to be done. To take an example, longlining requires more work than gillnetting. The crew also differs depending on how the catch is processed aboard the vessel. Cod must be dressed, while lobster is landed round on the dock.

The crew of vessels 60 to 85 feet (18.3 m to 25 m) long is comprised of four to five members, including the captain. Vessels over 100 feet (30 m) in length have 10 to 15 crew members.

The crew's time at sea varies with vessel size. Craft under 45 feet (13.7 m) long make one- to five-day runs; those measuring 45 to 65 feet (13.7 m to 19.7 m) long stay out five to seven days. The largest vessels remain at sea for up to 15 days.

(B) VALUE AND CAPITAL INVESTMENT

i. Vessel Value

A vessel's value is determined by several factors, including size, construction material and on-board equipment. The Quebec Bureau of Statistics (BSQ) defines a vessel's market value as that agreed upon through negotiation

between a buyer and a seller of good faith.[1] This value will be examined for Quebec as a whole in terms of vessel size and tonnage.

Length

Fig. 140 shows the total and average 1983 values of vessels in the various length classes. The vessels with the highest value (more than $26 million) are those measuring 45 to 54.11 feet (13.7 to 19.7 m). The five vessels of 100 feet (30.5 m) and over have an estimated value of $10 million. Fig. 141 shows a widely differing distribution between the total value and number of craft by length class.

p. 107 FIGURE 140 TOTAL VALUE (MILLION DOLLARS) AND AVERAGE VALUE (THOUSAND DOLLARS) OF VESSELS BY LENGTH, QUEBEC, 1983

($'000,000) ($'000)

- Total value
- Average value

under 7.6 m (under 25')
7.6 m to 10.5 m (25' - 34'11")
10.6 m - 13.6 m (35' - 44'11")
13.7 m - 19.7 m (45' - 64'11")
19.8 m - 30.4 m (65' - 99'11")
30.5 m and over (100' and over)
Length

SOURCE: BSQ, Pêche commerciale, 1983, preliminary data.

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[1] BSQ, Pêche commerciale, 1983, p. 12.

FIGURE 141 PERCENTAGE DISTRIBUTION OF VESSELS BY NUMBER AND VALUE, BY LENGTH CLASS, QUEBEC, 1983 p. 108

Percentage

- (%) Number
- (%) Total value

(same text as Fig. 140)

SOURCE: BSQ, Pêche commerciale, 1983, preliminary data.

The average value of vessels under 25 feet (7.6 m) long is about $2,000, while that of vessels 100 feet (30.5 m) long and over reaches $2 million. The amount of equipment aboard the largest vessels increases their value (see Fig. 140).

Tonnage[1]

The total value of vessels of small tonnage (under 25 tons) is slightly higher than that of large-tonnage vessels (see Fig. 142). It is the large number of craft in this class (85% of the total) that accounts for the high total value, i.e., $15 million. The overall value of vessels of 150 tons and over exceeds $10 million. Fig. 143 shows the difference between the distribution of total vessel value and capacity.

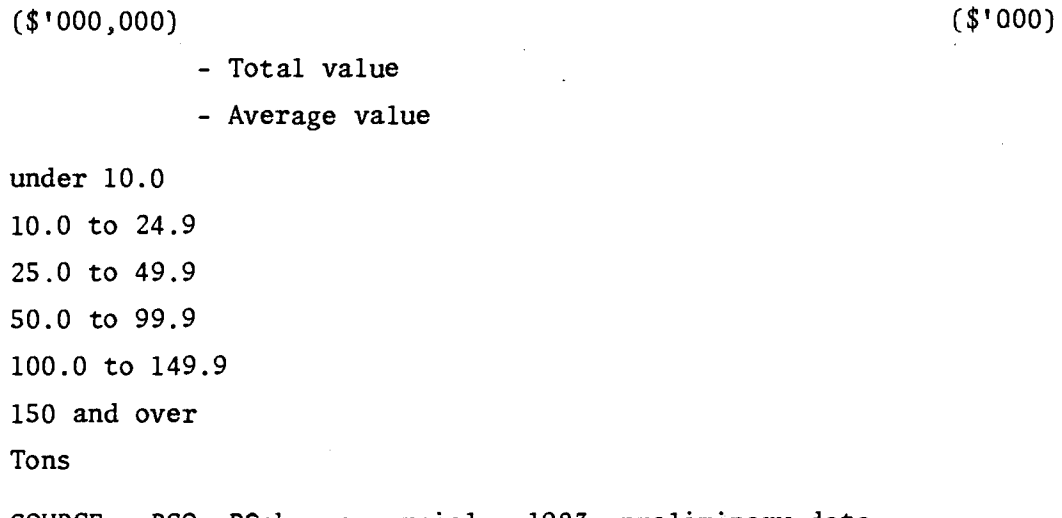
The average value also varies with vessel capacity. In 1983 fishing boats under 10 tons were valued at about $5,000; those of 150 tons and over had an estimated average value of $1.5 million (see Fig. 142).

[1] See Table A.67 for further details on the movement of total and average values by capacity in 1970, 1977-1983.

ii. Vessel Investment and Gear Expenditure

The Quebec Bureau of Statistics (BSQ) defines the investment in fishing vessels as the costs incurred for the purchase of new vessels, parts and equipment used for fishing during the year, such as the hull, motor and electronic navigation and fishing instruments.[2] Gear expenditure is defined as the outlay during the year on new fishing gear and the servicing and repair of used gear. These amounts are expressed in 1981 constant dollars.[3]

p. 109 FIGURE 142 TOTAL VALUE (MILLION DOLLARS) AND AVERAGE VALUE (THOUSAND DOLLARS) OF VESSELS BY TONNAGE, QUEBEC, 1983



SOURCE: BSQ, Pêche commerciale, 1983, preliminary data.

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[2] BSQ, Pêche commerciale, 1981, p. 12.

[3] Consumer price index.

FIGURE 143 PERCENTAGE DISTRIBUTION OF VESSELS BY NUMBER AND VALUE, BY TONNAGE CLASS, QUEBEC, 1983 p. 110

Percentage

- (%) Number
- (%) Total value

(same text as Fig. 142)

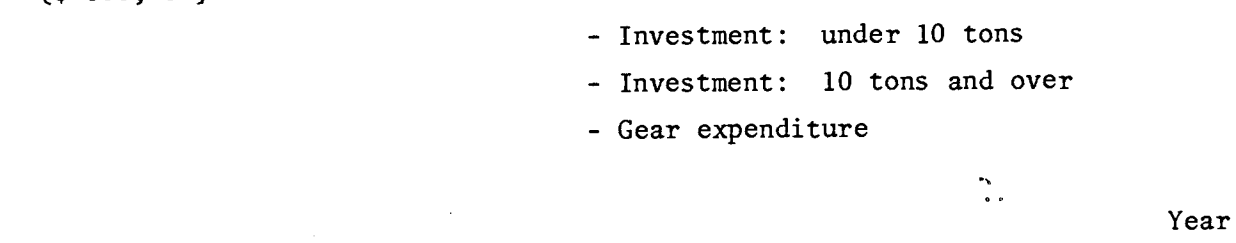
SOURCE: BSQ, Pêche commerciale, 1983, preliminary data.

Quebec

From 1977 to 1981 investment in vessels over 10 tons was generally higher than for vessels under 10 tons (see Fig. 144). The 1977 peak in investment spending in vessels over 10 tons is linked to the extension of the fishing zone to 200 miles, a move that led fishermen to modernize their vessels.

From 1977 to 1981 investment in vessels under 10 tons remained relatively stable at close to $1 million annually (see Fig. 144). Spending on fishing gear and equipment fluctuated considerably during the period. The increase of some $2.5 million posted between 1977 and 1979 is apparently explained by the purchase of the automatic baiters that hit the market at that time.

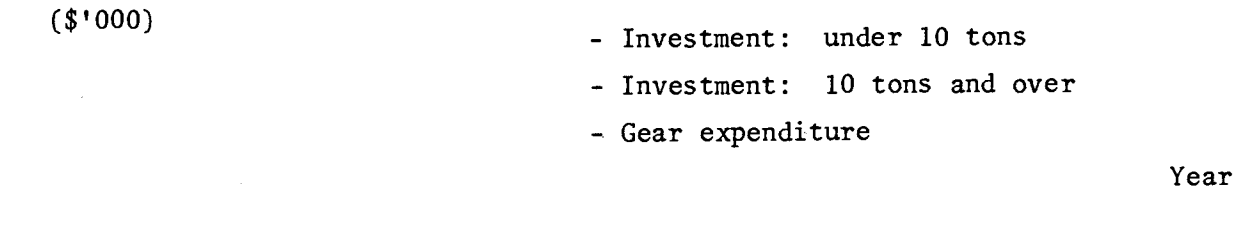
p. 111 FIGURE 144 VESSEL INVESTMENT AND GEAR EXPENDITURE, QUEBEC, 1970, 1977-1981 (IN MILLION DOLLARS[1])



SOURCE: See Table A.59.

[1] 1981 constant dollars.

FIGURE 145 VESSEL INVESTMENT AND GEAR EXPENDITURE, ST. LAWRENCE, 1970, 1977-1981 (IN THOUSAND DOLLARS[1])



SOURCE: See Table A.60.

[1] 1981 constant dollars.

St. Lawrence

Given the small number of vessels in the St. Lawrence region, investment there is lower than in the other regions. From 1977 to 1981 very little investment went into vessels under 10 tons, except in 1980 when spending climbed to $160,000 (see Fig. 145). No investment was made in vessels

over 10 tons during those years. In 1978, however, the amount reached $20,000 in constant dollars.

From 1977 to 1981 gear expenditure soared from $200,000 to upwards of $500,000.

Northern Gaspé

While investment in vessels 10 tons and over hit several peaks between 1977 and 1981, spending on vessels under 10 tons remained stable, albeit minimal. This ties in directly with development of the region's semi-offshore fishery as of 1977.

From 1977 to 1979 gear expenditure marked a substantial increase and then stabilized above $1 million during the next two years.

FIGURE 146 VESSEL INVESTMENT AND GEAR EXPENDITURE, NORTHERN GASPE, 1970, 1977-1981 (IN THOUSAND DOLLARS[1]) p. 112

($'000)

- Investment: under 10 tons
- Investment: 10 tons and over
- Gear expenditure

Year

SOURCE: See Table A.61.

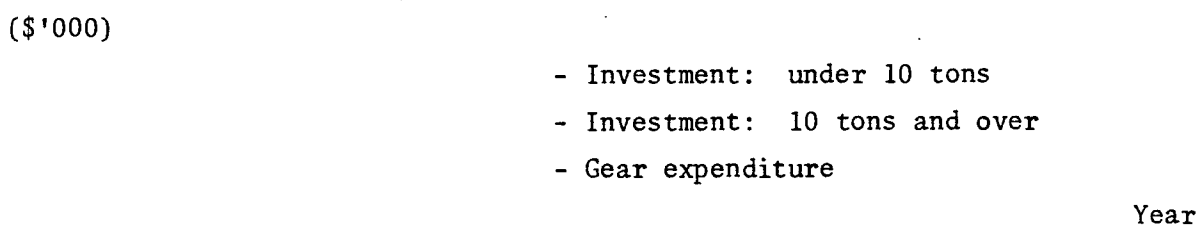
[1] 1981 constant dollars.

Southern Gaspé

From 1977 to 1981 the situation in Southern Gaspé resembled that in the northern part of the peninsula. Investment in vessels 10 tons and over far outstripped capital spending on vessels under 10 tons (see Fig. 147). Most replacements in the class of vessels over 10 tons involved vessels 45 to 65 feet (13.7 m - 19.8 m) long.

The stability of gear outlays during the period is explained by the stability in the number of vessels. In 1981 gear expenditure amounted to $1.5 million (constant dollars).

FIGURE 147 VESSEL INVESTMENT AND GEAR EXPENDITURE, SOUTHERN GASPE, 1970, 1977-1981 (IN THOUSAND DOLLARS[1])



SOURCE: See Table A.62.

[1] 1981 constant dollars.

Western North Shore

From 1977 to 1980 capital spending in vessels 10 tons and over underwent remarkable growth in the Western North Shore region (see Fig. 148). While

nil in 1977, that investment reached $300,000 in 1980. Investment in craft under 10 tons declined considerably over the period.

From 1977 to 1981 gear expenditure, like investment, rose steadily for vessels 10 tons and over. That strong increase is attributable to the purchase of equipment for large vessels. p. 113

FIGURE 148 VESSEL INVESTMENT AND GEAR EXPENDITURE, WESTERN NORTH SHORE, 1970, 1977-1981 (IN THOUSAND DOLLARS[1])

($'000)

- Investment: under 10 tons
- Investment: 10 tons and over
- Gear expenditure

Year

SOURCE: See Table A.63.

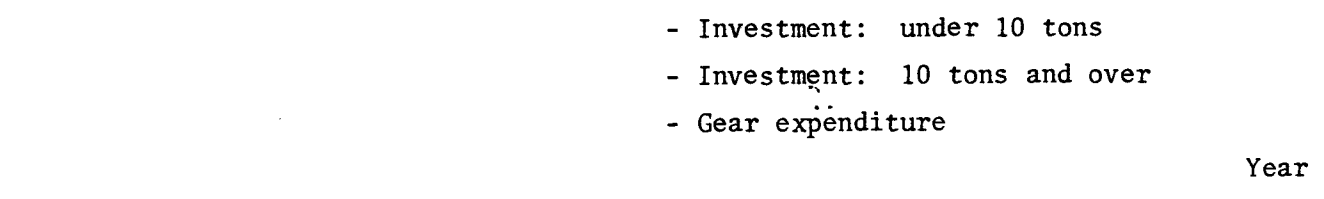
[1] 1981 constant dollars.

Eastern North Shore

Overall, the three types of spending exhibited parallel fluctuations in the Eastern North Shore from 1977 to 1981. Investment in vessels 10 tons and over peaked in 1980 at about $500,000 (see Fig. 149). Replacement of the inshore fleet peaked in 1979 when investment in vessels 10 tons and under came to $600,000. From 1979 to 1981, however, capital spending declined in both classes.

Gear expenditure rose by nearly $500,000 from 1977 to 1979 (see Fig. 149).

FIGURE 149 VESSEL INVESTMENT AND GEAR EXPENDITURE, EASTERN NORTH SHORE, 1970, 1977-1981 (IN THOUSAND DOLLARS[1])



SOURCE: See Table A.64.

[1] 1981 constant dollars.

Magdalen Islands

From 1977 to 1981 major fluctuations in investment spending occurred in the class of vessels 10 tons and over. In 1977 investment barely reached $1,000, while in 1980 spending totalled $2 million. During that period the number of vessels of 10 to 25 tons doubled, which would explain the rise in capital spending. Investment in vessels of 10 tons remained relatively stable (see Fig. 150).

From 1977 to 1979 gear expenditure rose considerably, but then fell in 1981, settling at $1.2 million.

FIGURE 150 VESSEL INVESTMENT AND GEAR EXPENDITURE, MAGDALEN ISLANDS, 1970, 1977-1981 (IN THOUSAND DOLLARS[1]) p. 114

($'000)

- Investment: under 10 tons
- Investment: 10 tons and over
- Gear expenditure

Year

SOURCE: See Table A.65.

[1] 1981 constant dollars.

(C) FLEET MODERNIZATION

Modernization is the outcome of a dynamic process that encompasses all components of the fishery, notably the fishing vessels. It may consist of the replacement of old vessels, the introduction of new fishing methods and physical modifications. Modernization is also translated in terms of equipment management.

The key components of modernization dealt with here are as follows:

(i) Hull construction materials

(ii) Fuel consumption

(iii) Electronic instrumentation

(iv) On-board quality control

The first generation of "modern" fishing vessels came to Quebec in the 1950s. But that new fleet (introduced mainly in the Gaspé) was not a "spontaneous" invention: trawlers had been operating for many years in Europe and along the New England coast before they made their appearance in Canadian waters.

In 1951 the Quebec government acquired a trawler and a dragger for the Grande-Rivière marine biology station. The two vessels were earmarked for comparative studies and experimentation.

Trawlers

Various fisheries agents were quick to realize the advantages of trawlers. This type of craft affords fishermen longer, more stable and more lucrative employment, as well as greater comfort and safety. Thanks to trawlers, industrial output is greater and more diversified, the fishing season is longer[1] and processing plants gain a more reliable source of supply.

The first trawler models were 48 feet (14.6 m) long; the second were 60 to 65 feet (18.3 to 19.8 m) long.

Table 8 gives the number of trawlers in the new fishing fleet.

First Generation of Draggers

Draggers differ from trawlers in several respects. They do not carry the same type of fishing gear; they have always been smaller than trawlers,

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[1] The fishing season could begin "even before the bait was lowered into the waters of the Gulf." Larocque, P., Pêche et coopération au Québec, pp. 244-245.

with narrower hulls and less powerful motors and winches. In addition, given their low draught, draggers have access to fishing harbours generally frequented by inshore vessels.

The first Cape Island type draggers measured 56 feet (16.8 m) in length (see Table 9). But the Gaspesienne gained rapid popularity owing to its motorized longline, comfort and much lower purchase price. However, its engine output and hold capacity were much smaller.

TABLE 8 ANNUAL CONSTRUCTION OF INSHORE FISHING VESSELS, 1952-1965 p. 115

Trawlers		Longliners	Gaspesiennes	Total
Wood	Steel			

SOURCE: Giroux, G., "Le service d'économie maritime et la flotte de pêche hauturière du Québec," in Actualités marines, Vol 9, No 2, 1965, p. 25.

TABLE 9 FIRST GENERATION OF THE MODERN FLEET: TECHNICAL SPECIFICATIONS AND PURCHASE PRICE (1957)

	Gaspesienne	Cape Island dragger	McKennis trawler 60'	McKennis trawler 65'
Overall length				
Width				
Gross tonnage (tons)				
Net tonnage (tons)				
Motor type				
Propelling force (HP)				
Test speed (knots)				
Fuel capacity (gal.)				
Freshwater capacity (gal.)				
Auxiliary generator				
Fish hold capacity (tons)				
Crew				
Purchase price (Feb. 1957)	$15,000	$25,000	$46,000	

SOURCES: Giroux, G., La flotte moderne de pêche du Québec, p. 384.
Laroque, P., Pêche et coopération au Québec, p. 247.

The harvesting potential of those vessels varied widely as well. A large dragger could fish 150 to 175 lines per run, i.e., 12,000 to 14,000 hooks for a total line length of 60,000 to 70,000 feet. The Gaspesienne carried about a hundred 320-foot lines, or 7,000 hooks for a total line length of 32,000 feet.[1]

[1] Giroux, G., La flotte moderne de pêche du Québec, p. 385.

During that period the pilothouses of Quebec's longliners and trawlers were equipped with electronic instrumentation--including radiophones, echo sounders and compasses--valued at $2,000 to $10,000 per vessel. A few vessels were radar-equipped as well.

(i) Hull Construction Materials

In 1962 the shipyards of Marine Industries Ltd. launched Quebec's first steel-hull trawlers. Until then, hulls had traditionally been made of wood. A fleet of steel vessels is now posted in Quebec, mostly in Cap-aux-Meules and Rivière-au-Renard.

The first fiberglass vessels in Quebec appeared in 1975 when the Chantier Maritime de Gaspé Inc. completed construction of two 45-foot (13.7 m) units for fishermen in Rivière-au-Tonnerre. The shipyards of Ateliers Maritimes de Tilly first tried this new material in the construction of 40-foot (12.2 m) draggers in 1978-1979 and 55-foot (11.6 m) trawlers in 1981-1982. In 1980 a few shipyards in the Magdalens made fiberglass draggers measuring 30 to 50 feet (9 m to 15.2 m) long. p. 116

Quebec fishermen, particularly those in the Gaspé Peninsula, have long been interested in the wooden vessels used in the Maritime provinces, mostly New Brunswick and Nova Scotia. Their interest is explained by the slightly lower purchase cost of those vessels. In addition, lower wages and different production methods enable shipyards in those provinces to market a less

expensive product. Two key factors, however, curb their penetration of the Quebec market: hull repair costs are higher in the Maritimes and edge-nail type vessels are apparently not as sturdy as the butt-jointed units made in Quebec.

(ii) Fuel Consumption

Certain types of vessels consume more energy that others, depending on the type of fishery for which they are used. Trawlers consume more energy than draggers, which have the advantage of using fuel solely to get to the fishing sites.

As of the 1970s inshore fishermen began looking for faster vessels, and the outboard motor snatched the market from the conventional inboard (putt-putt) motor. With rising fuel prices, conventional motors are regaining popularity and the demand for diesel motors is on the increase.

The owners of trawlers have been hit very hard by rising fuel prices, for their vessels consume fuel not only to get to the fishing sites but to tow the trawls during the fishery.[1]

Trawlers have always been equipped with diesel engines. From 1972 to 1982 the cost of diesel fuel rose from $0.18 to $1.00 a gallon.[2] This prompted

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[1] See Table A.68.

[2] See Lecours,D., Pêcheries, June and July-August, 1982.

a number of research services to investigate the design of propellers and drive systems. Furthermore, the use of wide-diameter propellers at reduced speed was shown to be energy-efficient.[3] Fuel consumption can be reduced in the short term through lower speeds, proper engine maintenance and lighter trawl doors. In the long term optimum results can be scored in part through the deployment of vessels made of lighter materials and equipped with more economical motors.

(iii) Electronic Equipment

For the past decade or so, the use of electronic instrumentation aboard fishing vessels has grown apace with advances in electronics. Greater compactness, more accurate and more complete information and a greatly enhanced quality-price ratio have made electronic equipment accessible and indeed essential to a smoothly run fishery. The electronic instruments below are available as aids to navigation.

- Automatic pilot
- Radar control
- Sounder
- LORAN C systems
- Compass
- Tachometer
- Radiophone monitoring
- Transmitter-receiver
- Map transcriber

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[3] See Pêcheries, January 1983, press review.

(iv) On-board Quality Control

One part of the long process of improving the quality of sea products has direct bearing on the fishing fleet. Three areas of activity relating directly to quality control will be described here: fishing methods and pre-processing and storage of the catch aboard the vessel.

Fishing Methods

The first activity likely to affect fish quality is undeniably the technique used to catch the fish. The various techniques are divided into two classes: those that involve killing the fish in the water and those that have the advantage of hauling the fish live aboard the vessel.

Following are the methods used to kill the fish underwater:

- Gillnetting

Most fish that become entangled in gillnets put up a vigorous struggle and, their gills blocked by the meshing, die of asphyxiation in a very short time.

When the nets are raised, all of the fish, with the exception of the last catches, are already dead, and the taste of their flesh has changed owing to the chemical waste produced by the muscles during the final struggle.

Upon the death of a fish, its stomach enzymes are activated and destroy the inner lining. Lice, crabs and whelks then puncture the skin, allowing bacteria into the flesh. This entire process reduces preservation time and

softens the flesh of the fish.

Still, gillnetting is a very practicel means of harvesting large quantities of fish, and quality will be good if the nets are raised once or twice a day. p. 117

- Trawling

Obviously, fish caught up in trawls are crushed at the tail end of the bag and their flesh is thus softened. In addition, the fish put up a struggle before being asphyxiated.

If trawling lasts five to six hours instead of two, the fish crushed at the tail end of the bag die asphyxiated and are heavily contaminated by excreta ejected by the pressure. The flesh is soft and, if the fish had fed heavily prior to capture, enzymatic decay has already begun.

The following techniques are used to haul fish live from the water:

- Trapping (weirs, cages, hoop nets and seines)

Trapping obviously produces the best quality fish because the catch is hauled aboard live. The fish are not exhausted from a desperate struggle to live and rapidly die a peaceful death on the deck.

- Jigging

Jigging compares with trapping in terms of the quality of the catch.

However, since the fish are often caught by the body, the nets are torn and stained with blood, creating a milieu conducive to bacterial contamination.

Longlining

While this method normally produces high quality fish, it has certain disadvantages. Fish taken by longlines put up a vigorous, exhausting struggle, with chemical waste building up in the body. If the fish survive, they may eliminate that waste.

Pre-processing

Shellfish do not require pre-processing before storage aboard ship, the only exception being scallops, which must be shucked prior to landing. The same is not true for pelagic fish and groundfish.

Pre-processing entails two or three operations:

- bleeding, which pertains only to groundfish;
- gutting and washing, which are done on the deck.

On-board Storage

Fish Storage Systems

Temperature is one determinant in the storage time and quality of fish. Bacterial growth will be retarded and deterioration minimized if the fish are stored at low temperature. Fish left unrefrigerated for even a few hours

aboard ship appear in good condition when they are landed, but their flesh has already started to undergo chemical changes that will only accelerate with time and heat. The quality of such fish may have deteriorated by the time the catch is delivered to the processing plant.

Three main methods are now used to store fish in the hold of a vessel. Fish can be preserved on chips or blocks of ice or in refrigerated sea water. If the necessary equipment is available, they can be frozen. The first two methods are used when the catch is to be landed fresh, while the third is used if the catch is to be frozen.

The most common and most practical means of preserving fish is to pack them in chips or blocks of ice. This convenient, economical solution has many advantages over the other methods. It requires no installation of costly equipment aboard ship. Back in port, an ice dealer supplies the vessel. Efficient preservation requires that the ice be in direct contact with the fish so as to absorb their body heat. Even distribution of the ice around the fish ensures a steady drop in body temperature.

The maximum icing time--to ensure adequate quality upon arrival at the plant--depends on the temperature of the fish before they are placed in the hold, the time they are preserved at that temperature and the handling conditions, as well as the quantity and quality of ice. The rate of bacterial decay depends mainly on the extent of original contamination, the

temperature above the freezing point and the time spent at that temperature.

Fish aboard vessels scheduled to remain at sea for more than ten days should be frozen. When suitably frozen and stored, most fish will keep for several months. Fish are often partially processed prior to freezing in order to reduce crowding in the freezing units, as well as deterioration during storage. The chief disadvantage of this method is its high cost. Furthermore, it is not used by Canadian fishermen given that the fishing banks are rarely more than one to three days of sea travel from the processing plants, making it more cost-effective to ice the fish and unload them fresh.

p. 118 Recent years have seen a growing interest in the storage of fish in refrigerated sea water. Through the use of mechanized refrigeration or simply icing, fish can be stored in sea water or brine at temperatures ranging from 28^{o} to $32^{o}F$ (-2^{o} to $0^{o}C$). This method has the advantage of keeping the fish hydrated and facilitates unloading. However, it has certain drawbacks as well. Proper circulation of the brine must be ensured. Neither the brine nor the refrigeration system should be charged with contaminants, such as fish scales, mucus or blood. The system should be thoroughly cleaned after unloading. This method is in the experimental stage for the tuna fishery. Refrigerated sea water has proved an extremely effective means of preserving live crab and lobster for more than two weeks. Cod and redfish could now be preserved for almost seven days without excessive deterioration of their quality.

The small open vessels and tugs fishing the Great Lakes preserve their catches in crates. Fish inspection regulations require that those crates be made of an approved material, such as salt water resistant aluminum, high density plastic, fiberglass or stainless steel. The crates must be fitted with lids that protect the fish from the sun and adverse weather. They must also have lifting rings or similar devices for landing the loaded crates at the dock.

The crates are used for ice storage, and fishermen should therefore plan on a sufficient supply of ice to preserve the day's catch.

Ice Storage

There are several ways to store fish in the holds of conventional vessels.

The most common method is bulk storage in which the fish are placed on ice in special cabinets. The disadvantage of this practice is that the fish are pressed tightly at the bottom of the cabinets. Its use is determined by the type of vessel, the season, the species harvested and the amount of ice required for the outing at sea.

To enhance the efficiency of this method, horizontal dividers can be used to prevent compression of the fish. The space between each shelf should not exceed 36 inches (90 cm) for groundfish and 24 inches (60 cm) for pelagic fish.

Box storage is widely used in Europe. The boxes, used mainly for the preservation of fresh fish, offer many advantages:

- easy washing and maintenance;
- less handling of fish upon offloading;
- interchangeability;
- relatively low cost;
- a wide range of shapes suited for different vessel configurations;
- stacking for offloading.

This method, however, has one major drawback: it requires more space than bulk storage.

C

Secondary Sector

p. 121 C - Secondary Sector

Quebec's processing plants are in a rather special position. The seasonal nature of the fisheries in the province causes continual movement within the industry. The plant operating periods and the size of the work force vary with the species harvested. These factors will be dealt with in detail for the six study regions. A description of fish products and the cost structure will round out the profile for Quebec as a whole.

1. PROCESSING PLANTS AND WORK FORCE

To ensure a quality product, only establishments that comply with specific health standards are granted operating permits. Only the provincial operating permit is required for establishments that market their products inside Quebec. A federal registration certificate is required for those that export outside of the province.

Some fishermen handle their own processing of sea products. They have no permanent facilities to speak of and operate individually, aboard their vessels, on the dock, on drying platforms or at home. This, however, is not regarded as industrial production.

Processing plants employ people to work in different areas of production. The work force is comprised of the production team, the maintenance team, truckers, clerical workers and sales and administrative staff. The term "worker" will be used for all persons employed in the above jobs, except

for the sales staff.

Employment is usually seasonal, and most plants close down in winter. The off season is spent cleaning, making repairs and sometimes remodelling the plant to enhance productivity. However, a team of watchmen is required in the warehouses at all times.

The notion of "person-year" will be used here to eliminate seasonal fluctuations in the work force. The number of person-years is calculated as follows:

$$\frac{\Sigma \text{ (number of workers} \times \text{number of months worked during the year)}}{\text{12 months}}$$

To take an example, a seasonal job that lasts six months represents 0.5 person-year.

The section that follows provides statistical data on the plants and their work force.

Quebec

Since 1977 the number of processing plants holding a federal registration certificate has grown. Fig. 151 indicates, however, a period of stagnation in 1978-79, as well as a loss of three establishments in 1982-83. In

the latter year 68 plants were in operation. From 1980 to 1981, 11 new establishments joined the 52 already in operation, raising the total to 63. In 1982 there were a record 71 plants in operation in Quebec.

FIGURE 151 NUMBER OF CENSUS PROCESSING PLANTS[1] IN QUEBEC, 1977-1983

Number of plants

Year

SOURCE: Inspection Service, Department of Fisheries and Oceans, Quebec Region.

[1] Plants holding a federal registration certificate.

From 1970 to 1977 the work force declined by 302.2 person-years (see Fig. 152). That loss was offset as of 1977 by an increase of 390 person-years.
p. 122 That growth is tied to the extension of the fishing zone to 200 miles, the rebuilding of fish stocks and the use of more sophisticated fish processing methods.

Figs. 151 and 152 point up a divergence in 1981-82. In spite of the decline in the number of person-years, the number of processing plants peaked, with an increase of eight plants. Fig. 155 shows the fishing season concentrated between May and August, the number employed in the plants reaching a maximum during that period.

FIGURE 152 NUMBER OF PERSON-YEARS WORKED IN QUEBEC PROCESSING PLANTS, 1970, 1977-1982

Person-years

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 10; 1977-78: tab. 12; 1979-81: tab. 13.

* 1982 (preliminary data).

St. Lawrence

According to Table A.71, no establishment in the St. Lawrence region met processing plant compilation criteria from 1977 to 1983. However, in 1983 one plant held a federal registration certificate (see Fig. 153). The 1983 work force data were unavailable at this writing.

FIGURE 153 NUMBER OF CENSUS PROCESSING PLANTS[1] BY REGION, 1977-1983

Number of plants

Southern Gaspé
Northern Gaspé
Magdalen Islands
Western North Shore
Eastern North Shore
Other regions
St. Lawrence

Year

SOURCE: Inspection Service, Department of Fisheries and Oceans, Quebec Region.

[1] Excluding plants employing less than 5 workers.

p. 123 Although the ratio of regional to provincial landings was low (less than 4%) from 1977 to 1983, some species were actively harvested in the St. Lawrence region. The regional fishery enables some local plants to engage in basic processing activity. Those plants are not included in Table A.69, their activity being too marginal to be inventoried. Landings in the region also afford some manufacturers in the metropolitan area a supply of fresh sea products. They transport the fish in refrigerated trucks from the unloading docks to the plants for processing.

Northern Gaspé

The number of processing plants in Northern Gaspé has increased significantly since 1977, compared to that in other regions. It tripled in six years, from six in 1977 to 18 in 1983. Since 1979, in spite of this growth in the number of establishments, there was no upward movement in employment, which ranged from 500 to 600 person-years (see Fig. 154). In 1981 employment reached a high of 642.9 person-years. From June to September more than 1,000 workers were employed in plants in the region. However, the busiest period is generally from May to October and the employment level is at its highest.

The period 1970-1979 saw a substantial gain in the number of workers (237.5 person-years, or 59.4% of the total). That gain is attributable to larger landings and to the fact that emphasis on the packaging of processed products created the need for a larger work force.

Southern Gaspé

Since 1977 Southern Gaspé has had the largest number of processing plants in the province. Fourteen plants were inventoried that year, at which time the region accounted for 35% of all plants. The number of plants in Southern Gaspé relative to total plants has since declined, but the region still ranks first on this score. In 1981 the number of regional establishments peaked at 20, for 31.7% of the total (see Fig. 153). From 1982 to 1983 it remained stable, 19 plants making up about 27% of all plants inventoried in Quebec.

The processing plants in Southern Gaspé are an appreciable source of employment for the region's population. Owing to overexploitation of fish stocks between 1970 and 1977 and the opening of new plants in other regions, the number of available jobs declined. A comparison of landings in 1970 against those in 1975 and 1976 shows harvests dropping by about a third.

FIGURE 154 NUMBER OF PERSON-YEARS WORKED IN PROCESSING PLANTS BY REGION, BY YEAR, 1977-1982

Person-years

Southern Gaspé
Magdalen Islands
Northern Gaspé
Western North Shore
Eastern North Shore
St. Lawrence

Year

SOURCE: BSQ, Pêche commerciale, 1970: tab. 10; 1977-78: tab. 12; 1979-81: tab. 13.

* 1982: preliminary data.

Annual quotas are now imposed in the Gulf to limit the harvesting of designated species and preserve the fishery resource.

The Southern Gaspé region boasted the highest monthly employment averages during the summer season, except in 1979. In 1981 the number of person-years reached an unprecedented level of 817.5 (see Fig. 78). From 1977 to 1982 that number rose by 301.2 person-years, varying a total of 61.5%.

Although the fishing industry provides seasonal jobs, the period of intense regional activity is fairly long. A great many people are employed from May to October. Cod, the main species landed in the region, is fished throughout the summer. This explains the stability of employment during those six months.

p. 124 FIGURE 155 AVERAGE MONTHLY EMPLOYMENT IN FISH PROCESSING PLANTS, QUEBEC AND SIX STUDY REGIONS, 1970, 1977-1983

Number employed

Quebec
Northern Gaspé
Southern Gaspé
Magdalen Islands
Western North Shore
Eastern North Shore
St. Lawrence

January
February

March
April
May
June
July
August
September
October
November
December
Month

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1982.

Western North Shore p. 125

The number of plants in the Western North Shore remained stable from 1977 to 1979. During those years there was some expansion of existing plants, as well as a gradual rise in the number of workers. In 1980 three new plants were added to the four already in operation. That growth was the strongest posted for the period 1977-1983. Up until 1982 there was a steady rise of one plant a year; the total (nine plants) was maintained in 1983 (see Fig. 153).

From 1970 to 1982 the number of workers tripled, rising at a fairly steady pace. During that period 104.1 person-years were added to the regional plant work force, raising the total to 159.7 person-years. Employment peaked in 1981 at 192.5 person-years (see Fig. 154).

The fishing season in the Western North Shore is fairly long, extending from May to September. But the month of June is the high point of the summer.

Eastern North Shore

Up until 1982 the Eastern North Shore was the region with the smallest inventory of plants (see Fig. 153). Since 1970 the number of plants has grown steadily. Only one decline occurred, the number of plants dropping from three in 1978 to two in 1979. However, the region gained three new plants the next year. In 1983 seven plants were recorded.

In 1970 the number of person-years peaked at 78 (see Fig. 154). However, that performance cannot be described as significant given that the number of person-years has always been quite stable. From 1970 to 1982 it never fell below 40 or rose above 78. In spite of the opening of new plants in 1979-80, there has never been a very large number of workers in the Eastern North Shore. The introduction of the 200-mile fishing zone and the rebuilding of fish stocks did not really spell growth for this part of the North Shore. Still, from June to September the plants in the region witnessed periods of increased productivity. The largest landings of cod, crab and herring, the main species in the region, occur during these four months. A few plants in the Eastern North Shore have no registration certificate, although their products are sold in Newfoundland.

Magdalen Islands

From 1970 to 1978 the number of plants in the Magdalen Islands rose from seven to ten (see Fig. 153). That growth coincided with the rebuilding of fish stocks in the Gulf and along the Atlantic coast. The regional industry then stabilized: nine or ten plants were inventoried since 1980. The number of regional establishments included in the count is variable. They are licensed by the province and are vital to the economic and social vitality of the region.

Overall, the Magdalens evolved along the lines of Southern Gaspé in terms of person-years. Indeed, from 1970 to 1977 fish stocks were overexploited both in the Magdalens and in Southern Gaspé, entailing a decline in the number of workers. Then from 1977 to 1982 the work force expanded by 304.3 person-years (84.8%) (see Fig. 154). In 1970 total landings amounted to 28,815 metric tons (t), as against 20,566 t in 1982. In 1970, 359 person-years were worked. Twelve months later, that figure stood at 663.3.

The work force is generally the largest in May and June when fishing of the local species (lobster and crab) steps up.

Other Regions

The term "other regions" (see Table A.69) encompasses all of Quebec's plants located outside the study regions, e.g., in the Montreal region.

In 1977 six plants were located outside the study regions. Five years later there were 12, a steady increase having occurred since 1979. In 1982-83 there was a decline of seven establishments, which is explained by the fact that several plants no longer in operation had nevertheless been counted prior to 1983. To clarify the situation, a survey was conducted to find out which plants were actually operating.

2. QUANTITY AND VALUE OF PRODUCTS SOLD IN QUEBEC

The types of processing of fish supplied to the plants vary with the region, customer needs, plant capacity and general economic conditions. This subsection is not aimed at detailed analysis of these many factors but at a general description of the main sea products processed in Quebec since 1977. The most recent statistics available are from 1982. The reader is advised to match the tables on processed products and landings.
p. 126 Landed fish are measured "round and dressed," while processed products are weighed in their final form. Note that the value of fish products is expressed in current dollars.

Cod

This species, regardless of its final form, ranks first among processed products. In 1982, 14,138.66 t of cod were prepared in Quebec plants, for double the 1977 quantity and a value of $31,204,631. The output of "Gaspé cured" and "ordinary cured" dried cod was the most lucrative,

accounting for 27.7% of the quantity and 43.3% of the value of production in 1982 (see Table 11). In terms of quantity processed in 1982, salted cod headed the list, making up 32.8% of the total volume of cod products.

In 1980-81 salted cod ranked first in quantity and value. Fresh or frozen round cod and fresh cod fillets, which required little processing, had little value in relation to the quantities produced. In 1982 that particular production totalled 9% of the quantity produced in Quebec and 3.5% of the value (see Table 11).

Redfish

US fishermen did not really begin harvesting redfish in Canadian waters until 1935; Canadian fishermen started in 1950. The species then accounted for massive fisheries until 1972, with the result that redfish stocks were depleted. The imposition of quotas since the easly 1980s has brought about an increase in the biomass. Redfish are usually marketed as frozen fillets. In 1977, 2,624.98 t were placed on the market, for an estimated value of some $5 million. In 1982, 3,524.51 t of redfish fillets were produced, for a value of close to $9.7 million. The value of the other redfish products was negligible.

Sole

Sole are processed mainly in Gaspé and the Magdalen Islands. This species is marketed in various forms, particularly frozen and in blocks. In 1977,

1,303.76 t were processed, or about four times more than in 1982 (see Table 11).

Turbot

Turbot is marketed round or as fresh or frozen fillets. In 1982 these three products totalled 100% of the foods manufactured from this species. Turbot was once sold in blocks or salted. In 1982 frozen fillets ranked first among the processed products, accounting for 91.3% of the total. That quantity made up 81.3% of the volume, or 518.43 t. In 1980-81 round turbot ranked first in terms of quantity (54.9%); fresh fillets were second in quantity but first in value at $907,959 (see Table 11).

Overall, from 1977 to 1982 the quantity of products manufactured from turbot dropped 38.4%, but the value of those products rose. This economic phenomenon is evidently attributable to more sophisticated processing and higher market prices. In 1982, moreover, the percentages for the quantity and value of round and filleted turbot were lower than in 1981.

Herring

Herring has long been used as bait for more lucrative species. In 1982 fish bait made up 50.8% of the total quantity of herring products and was valued at close to $586,628 for Quebec plants (see Table 11). Since 1977

the increase in the value of bait herring exceeded the increase in volume, enabling fishermen to obtain better prices per kilogram. Fresh herring and frozen herring share second place. This fish is also marketed salted and smoked, but this product accounts for only a small portion of sales. Major changes in quantities from year to year have triggered fluctuations in the value of the various types of herring products.

Mackerel

Most mackerel come from the Magdalen Islands and Southern Gaspé and are marketed as round, filleted or canned fish or as bait. Mackerel has also been sold salted. Canned mackerel now ranks first among mackerel products in terms of quantity (50.8%) and value (81.8%) (see Table 11) and has generally dominated the market since 1977. However, in 1978-79 whole mackerel and frozen fillets headed the list of terms of quantity. Overall, in 1982 canned mackerel contributed about $2.7 million to the fish products industry, or 11 times the value and seven times the quantity posted in 1977. Arrangements with the Canadian International Development Agency (CIDA) explain the type of processing used for mackerel.

Crab

Crab is a crustacean that generates great commercial interest. In 1982 Quebec produced 3,056.16 t of crab in various forms--whole, sectioned, fresh, frozen and canned meat--or some 10 times more than in 1977. That

production was valued at $28.3 million (see Table 11). Whole crab ranked first in volume at the time, while processed crab was generally first in both quantity and value. In percentage terms, the value of processed crab naturally exceeds the volume. The opposite is true of whole crab. This points up the fairly high prices of processed crab.

Lobster

Magdalen Island fishermen harvest lobster from May to July. This crustacean is a highly prized luxury product and sells mainly as live or frozen whole meat. In 1982, 788.69 t of live lobster and 323.33 t of frozen whole lobster went to market, making up 66.8% and 27.4%, respectively, of all lobster products (see Table 11). Sales of fresh whole lobster reached $2.1 million. Overall, these two products were in the reverse position in 1977. Still, lobster is the most lucrative in more elaborate forms. In 1982, for instance, only 1.8% of the total quantity was claimed by canned lobster, which nevertheless accounted for 7.8% of the total value. Lobster producers had their best year in 1981 when 1,392.54 t were sold ($10.3 million). The quantity and value of processed lobster have generally remained fairly stable since 1977.

Shrimp

Quebec's shrimp fishery dates back to 1965, but the intensive harvesting of this crustacean began in 1973. In 1982 the processed value of shrimp amounted to $13.1 million, ranking it third--after cod and crab--among

Quebec's sea products. A total 1,465.46 t of shrimp were processed (see Table 11), making 1982 the best year during the study period.

Shrimp can be bought in the shell or shucked as fresh or frozen meat. In 1980-81 sales of shell shrimp were very strong, i.e., 36% of the total volume of shrimp products on the market in 1980 and 58.3% in 1981.

Scallop

Scallops are an appreciable source of income, particularly in the Magdalen Islands. Fresh or frozen scallop meat is a highly prized luxury food. In spite of a good yield in 1978 (50.5% of the quantity and 45.9% of the value; see Table 11), this mollusc is no longer sold round or in blocks. In 1982, 35.8 t of scallops were processed solely as fresh or frozen meat, bringing Quebec processing plants an income of $480,925. Still, that was not a good year. In 1979, 104.48 t were processed ($807,562); in 1981 the figure stood at 103.89 t ($1,1 million).

Salmon

Salmon is marketed round and as fresh or frozen fillets or steaks. Table 11 shows fresh or frozen salmon contributing $507,639 to Quebec plants in 1982 when 70.96 t were processed. However, that was not as good a year as 1980 and 1981 when volumes of 127.96 t and 108 t, respectively, were posted, for values of $743,317 and $643,910.

Eel

Eel was not in very geat demand in 1982 when only 231.64 t of round eel were sold (see Table 11). That was the worst production year since 1977, bringing in only $510,677. As a rule, upwards of 350 t of round eel are processed in Quebec, for a turnover of about $1 million. In 1980, 426.91 t of eel products were manufactured in the province. That year scored the best economic yield, i.e., $2.6 million. Europe is the principal customer for these eel products, although chemical contamination has limited that market.

The list below gives the main species harvested in Quebec in 1982 in order of quantity and value.

TABLE 10 PRINCIPAL FISH PRODUCTS IN ORDER OF QUANTITY AND VALUE

Quantity	Value
Cod	Cod
Herring	Crab
Redfish	Shrimp
Crab	Redfish
Mackerel	Lobster
Shrimp	Mackerel
Lobster	Turbot
Turbot	Herring
Sole	Sole
Eel	Eel
Salmon	Salmon
Scallop	Scallop

Fish Meal

Fish meal is generally mixed with various grains to make feed for pigs and other farm animals. It is also used in the manufacture of biological fertilizers. The use of fish meal has declined in recent years. In 1982, 1,097.78 t were produced, for a profit of $789,217. In 1979 profits totalled $2.2 million for a production of 2,549.60 t (see Table 11). p. 128

TABLE 11 QUANTITIES AND VALUES OF PRINCIPAL FISH PRODUCTS MANUFACTURED IN THE MARITIME REGIONS OF QUEBEC, 1977-1982 (IN METRIC TONS AND CURRENT DOLLARS)

Product	1977			
	Quantity	%	Value	%
COD				
Round, fresh and frozen				
Fresh fillets				
Frozen and smoked fillets				
Blocks and sliced blocks				
Salted				
Dried				
Other forms				
REDFISH				
Frozen fillets and blocks				
Other forms				
FLOUNDER AND SOLE				
Round				
Fresh fillets				
Frozen and blocks				
Other forms				

TURBOT
Round
Fresh fillets
Frozen fillets
Other forms

HERRING
Fresh
Frozen
Bait
Other forms

MACKEREL
Round and frozen fillets
Bait
Canned
Other forms

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* Under 0.05%.

p. 129 TABLE 11 (concluded) QUANTITIES AND VALUES OF PRINCIPAL FISH PRODUCTS MANUFACTURED IN THE MARITIME REGIONS OF QUEBEC, 1977-1982 (IN METRIC TONS AND CURRENT DOLLARS)

Product	1977			
	Quantity	%	Value	%
CRAB				
Round				
Meat and canned				
Other forms				

LOBSTER
Live
Frozen round
Frozen meat
Paste
Canned
Other forms

SHRIMP
In shell
Fresh and frozen meat
Other forms

SCALLOP
Fresh and frozen meat
Other forms

SALMON
Fresh and frozen
Other forms

EEL
Round
Other forms

FISH MEAL

TOTAL, PRINCIPAL SPECIES

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* Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1977-1982.

SUMMARY

To summarize, 1982 sales of processed marine products brought Quebec plants $101,536,117 for a total production of 32,595.31 t. That economic performance represented more than a twofold improvement over 1977. The year 1981 headed the list in terms of quantity, and 1982 was the best year in terms of value.

3. FISH PROCESSING PLANT STRUCTURE

This section deals with the internal structure of Quebec's establishments[1] by size and cost structure.

Size

Plant size marked a significant change during the 1970s, in terms of numbers employed at any rate. The number of person-years rose slightly more than 400, for a percentage change on the order of 25%. The change in the number of plants by the various size classes exhibited two distinct trends. The number of plants dropped from 1972 to 1977, the smallest plants being the hardest hit by that decline (see Table 12). However, from 1977 to 1981 the total number of plants rose slightly owing to the medium-size class.

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[1] The number of establishments censused by Statistics Canada differs from the number cited in the previous subsection given that Statistics Canada considered only those plants which supplied the pertinent data for its purposes. Table 12 is therefore to be regarded as a sampling rather than an exhaustive profile. See Statistica Canada Catalogue 31-528: Concepts and Definitions of the Census of Manufactures.

In 1972 plants employing five to nine workers claimed the largest proportion of the total. Since 1977 plants with 20 to 49 workers have taken the lead. The change in the number of workers per establishment, i.e., from 40.6% in 1970 to 52.4% in 1980, bears out this trend (see Table 13).

Thus, the Quebec fishing industry is comprised mostly of small and medium-sized businesses. No establishment with more than 500 workers was censused; overall, there are few establishments employing 200 or more workers.

The value of shipments and the value added are other factors used to assess plant size. The change in quantities processed, improved productivity and more refined processing have boosted the value added, which rose from $155,800 (1971 constant dollars) from 1970 to 1981, despite a large drop from 1980 to 1981. During those 11 years the total value of shipments rose to $777,900 (1971 constant dollars). In 1978-79 the total value of shipments per Quebec establishment declined, whereas the total value added per establishment increased.

TABLE 12 NUMBER OF ESTABLISHMENTS BY SIZE CLASS (NUMBER OF WORKERS), QUEBEC, 1972, 1977-1981

Size class (Number of workers)	1972* No. of estab.	(%)
0 to 4		
5 to 9		
10 to 19		
20 to 49		
50 to 99		
100 to 199		
200 to 499		
500 to 999		
1,000 and over		
TOTAL		

SOURCE: Statistics Canada, Catalogue 31-203.
*First year in which these statistics were compiled.

p. 131 TABLE 13 AVERAGE SIZE OF QUEBEC PROCESSING PLANTS, 1970, 1977-1981

Description	1970	1977	1978	1979	1980	1981
. Total value added* by establishment, in thousand 1971 dollars[1]						
. Total value of shipments, in thousand 1971 dollars[2]						

. Number of workers per establishment

. Total wages per establishment, in thousand 1971 dollars[1]

. Average wage per worker, in thousand 1971 dollars[1]

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* Net production value calculated as the value of shipments + the net value of stocks in process and finished stocks - the cost of materials and supplies - the cost of fuel and electricity purchased and used. The total value added also includes production grants but not indirect taxes.

SOURCE: CANSIM (matrix 7505), Statistics Canada.

[1] GNP index.

[2] Fish products sales price index.

This phenomenon is explained by the decline in the market prices of cod and crab and by variations in inventories.

There was strong movement in total wages per establishment during the study period. The changes reflect the increase in the average number of workers per plant and the net improvement in wage conditions. The average annual

wage of plant workers rose from $3,440 in 1970 to $5,660 in 1981 in real terms (1971 dollars), for an increase of $2,220, or 64.5%.

Cost Structure

Analysis of the value of production shipments points up the relationship between processing plants and landings (see Fig. 156 and Table 15).

The cost of raw materials accounts for 60% of the value of shipments; the cost of energy makes up 1.6% to 2.2% of that value. The production value added accounts for more than a third of plant shipments.

Another item in Table 14 shows significant movement from 1970 to 1981, i.e., the proportion of production workers relative to total workers declined from 94% in 1970 to about 80% from 1978 to 1981. This points to stabilization of the number of administrative workers during the period.

FIGURE 156 COMPONENTS OF PRODUCTION SHIPMENTS

Value of production shipments + Stocks in process / Finished stocks = Cost of raw materials + Cost of fuel and electricity + Production value added

N.B. See Statistics Canada Catalogue 31-528 for definition of the terms used.

TABLE 14 COST STRUCTURE OF QUEBEC PROCESSING PLANTS, 1970, 1977-1981 p. 132

Description	1970	1977	1978	1979	1980	1981
Fuel relative to production shipments (%)						
Raw materials relative to production shipments (%)						
Production value added relative to production shipments (%)						
Number of production workers relative to total workers (%)						

SOURCE: CANSIM (matrix 7505), Statistics Canada.

D

Tertiary Sector

—— Marketing

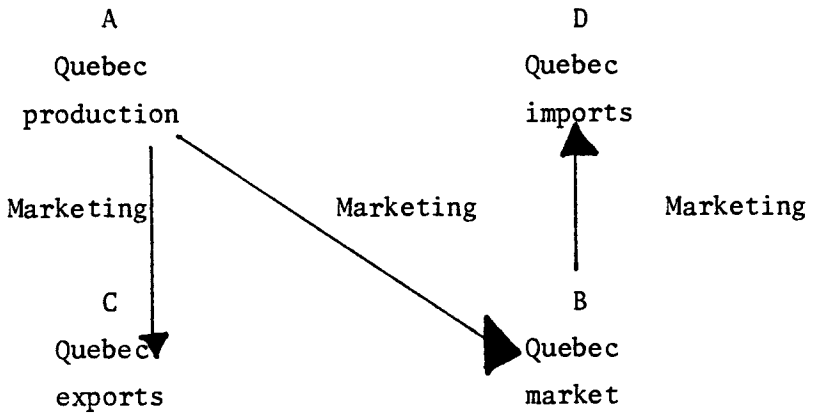
D - Tertiary Sector - p. 135
Marketing

This section deals with the various aspects of the marketing of fishery products in Quebec.

The marketing dynamics are illustrated in Fig. 157. Block A represents the production of processing plants, fish farms and certain fishermen of Quebec. The potential Quebec market for this output is represented by block B and exports by block C. The province also resorts to imports (block D) to satisfy the demand for certain specific marine products.

The first part of this analysis deals with the consumption of marine products in and outside Quebec as the determinant in output distribution as well as export and import volumes. The second part deals with the factors relative to penetration of the Quebec market. The origin of imports and the destination of exports of marine products are explained in the third and fourth parts. The algebraic sum of import and export values represents the trade balance, which will be examined in the fifth part. The sixth and final part concerns the marketing of Quebec's fishery products.

FIGURE 157 THE MARKETING OF SEA PRODUCTS IN QUEBEC



SOURCE: This diagram is derived from the one presented in La commercialisation des produits de la pêche au Québec. État de la situation. Quebec Department of Agriculture, Fisheries and Food (MAPAQ), Planning Branch, March 1982, p. 20.

(1) CONSUMPTION

Quebec consumption of fishery products is relatively small by comparison with that in other parts of the world. The Japanese are the leading consumers of fish in the industrialized world (see Table 16). In 1977 they consumed 9.5 times more fish than Quebecers; per capita consumption amounted to 65.7 kg in Japan, as opposed to 6.8 kg in Quebec. In addition, per capita consumption in Quebec was 0.7 kg lower than in Canada as a whole. The United States is the only industrialized country with a lower level of consumption of fishery products than Quebec. However, that level

marked steady improvement in Quebec in the space of a decade (see Table 15), rising from 5.04 kg per capita in 1968 to 6.91 in 1979. The gradual increase in Quebec consumption of marine products and Quebecers' growing attention to their dietary habits augur well for a rising demand for these products.

TABLE 15 CONSUMPTION OF FISHERY PRODUCTS IN QUEBEC, 1968-1979

Year	Per capita consumption - kilograms -	Total consumption - metric tons -

[1] Interim figure.

SOURCE: La commercialisation des produits de la pêche au Québec. État de la situation, MAPAQ, March 1982.

The popularity of fish varies according to species and type of processing (see Table 17). For the period 1968-1978 the proportion of smoked, salted and cured fish declined from 10.3% to 5.2% (dipping as low as 2.8% in 1977), while that of canned products rose from 22.4% to 26.2%. Quebec consumers prefer fresh and frozen products (fish, molluscs and crustaceans). This

type of product accounts for close to 70% of the total demand for marine products.

The potential Quebec market will be interesting to watch over the coming years. Indeed, the enforcement of new quality standards for marine products, allied with a concerted marketing effort, hold out promising results for the future.

p. 136 TABLE 16 PER CAPITA CONSUMPTION OF FISHERY PRODUCTS,[1] POPULATION AND TOTAL CONSUMPTION OF FISHERY PRODUCTS IN QUEBEC AND SELECTED COUNTRIES, 1977, 1981 AND 1985 (PROJECTIONS)

Country	Per capita consumption - kilograms -	1985 (Projections)
Japan		
Spain		
Portugal	Population - in millions -	Per capita consumption
France		
Belgium	Total consumption - metric tons -	Total consumption
Sweden		
Netherlands	Variation 1985 / 1977 Projections (%)	
Greece		
Canada		
U.K.		
(QUEBEC)		
United States		

[1] Weight convertible to product weight.

SOURCE: Ibid.

TABLE 17 PERCENTAGE DISTRIBUTION OF THE VARIOUS FISHERY PRODUCTS RELATIVE TO QUEBEC CONSUMPTION, 1968-1978 p. 137

Product
Fish and shellfish, fresh and frozen
Processed fish (smoked, salted, pickled)
Fish and shellfish, canned
TOTAL

The figures may not add due to rounding.

SOURCE: Ibid.

(2) THE QUEBEC MARKET

The Quebec sea products market is supplied largely by imports, a situation that is explained by two major factors. For one, Quebec consumption of these products exceeds the provincial output. In 1979 consumption amounted to 43,433 metric tons (t), whereas production stood at 22,936 t. For antoher, 69% of Quebec production is exported. The imbalance between production and consumption applies to fish species as well. The chief imports are large shrimp, rock losbter, tuna and sardines, as these species are not available in Quebec.

The total production of processing plants, fishermen and fish farms amounted to some $113 million (1980 wholesale price), and close to $35 million (31%)

of that production were distributed in Quebec. Given distribution costs, the commercial value of Quebec fishery products sold within the province amounted to about $50 million. Of an overall market of $200 million, Quebecers spent $150 million on imported sea products.

In short, there are two reasons to believe that Quebec can improve its penetration of the local market: Quebec consumption is low compared to that of the other provinces and countries, and fish could be a good meat substitute owing to its high protein content.

(3) EXPORTS

After a period of stability between 1970 and 1975, Quebec fishery product exports rose considerably up until 1980. Exports totalled $27 million in 1970 and were only slightly higher than $28 million in 1975. But from 1975 to 1980 the export value rose by some $56 million, reaching $84 million (see Table 19). That upswing is explained in part by price variations. The recovery in the export value coincided in a way with the extension of Canadian territorial waters, which favoured larger catches. That extension entailed a major realignment of international trade. Some countries, deprived of their traditional sources of supply, saw their catches decline substantially and had to resort to foreign supplies to meet their internal demand. Canada--and Quebec more particularly--benefitted from the new commercial order.

The rise in export values is attributable to the development of new markets, mainly in continental Europe. The United Kingdom became a major outlet for fishery product exports, particularly molluscs and crustaceans. It claimed 15% of total exports in 1980 (see Table 20). Other countries, including France, Portugal and West Germany, were interesting markets for Quebec exports. In 1980 those three countries received some 25% of Canada's marine product exports.

In 1980 the United States imported 37% of Quebec exports. US import trade is very varied and encompasses the principal fishery products of Quebec (see Table 20). The other clients import specific products. In 1980 total shipments out of Quebec came to $100 million (see Table 18). The proportion of shipments to the rest of Canada accounted for 14.9% of the value of total shipments out of Quebec.

The various products sold on international export markets showed unequal growth from 1970 to 1980 (see Table 19). Fish made up close to half of p. 138
the export value of fishery products, accounting for 55.7% of total exports, valued at about $47 million. Salted and/or dried fish were the chief fishery product exported in 1980, followed by fresh, chilled or frozen fish fillets. From 1975 to 1980 the export value of shellfish quadrupled, soaring from $8 million to nearly $33 million. That year the shellfish group accounted for 38.9% of overall exports, for a value of $32.8 million.

TABLE 18 VALUE (IN CURRENT THOUSAND DOLLARS) OF QUEBEC FISHING INDUSTRY SHIPMENTS TO THE REST OF CANADA AND AS A PERCENTAGE OF TOTAL SHIPMENTS, 1974 AND 1980

	1974		1980	
	($'000)	(%)	($'000)	(%)
Atlantic provinces				
Ontario				
Western provinces				
Total shipments to rest of Canada				
Total shipments of Quebec industry				
Shipments to rest of Canada				

SOURCE: La commercialisation des produits de la pêche au Québec. Etat de la situation, MAPAQ, March 1982.

TABLE 19 VALUE OF INTERNATIONAL EXPORTS OF QUEBEC FISHERY PRODUCTS, 1970, 1975 AND 1980 (IN CURRENT THOUSAND DOLLARS)

Product	1970	1975	1980
Fish:			
Fresh, chilled or frozen			
Fresh, chilled or frozen fillets			
Fresh, chilled or frozen blocks, n.a.o.			
Smoked or salted and smoked			
Salted and/or dried			
Pickled			
Canned			

Shellfish:
Fresh, chilled or frozen
Canned

Other fishery products
TOTAL

---

[1] n.a.o. not available otherwise

SOURCE: Ibid.

(4) IMPORTS

The value of Quebec imports increased tremendously during the period 1970-1980, rising from $14.8 million to $71.4 million (see Table 21). Imports cleared into Quebec were from a limited number of countries (see Table 22). Indeed, 92.1% of imports came from the ten largest countries. The United States, Cuba and Japan are Quebec's three leading suppliers and account for 80% of total imports. In 1980 the US was the principal supplier, making up 60.3% of imports into Quebec. US shipments of sea products were highly diversified. Products from Cuba made up 16.8% of Quebec imports, mostly molluscs and crustaceans. Japan accounted for 4.2% of total imports. The other suppliers specialize in specific products.

The growth in the value of marine products is unevenly distributed among the various products (see Table 23). Fresh, chilled or frozen shellfish form the main group of imports. In 1980 shellfish accounted for 46.9% of total imports, for a value of $33.5 million. The other major product groups were fresh, chilled or frozen fish and fish blocks, which totalled $10.6 million (15.0% of total imports) and $10.8 million (15.1% of total imports), respectively. The latter group exhibited the strongest growth from 1970 to 1980, rising from $881,000 to $10.8 million.

(5) TRADE BALANCE

The trade balance for fishery products reflects the difference between exports charged to Quebec and imports cleared into Quebec. In this

document, interprovincial trade was not considered in calculating the trade balance, which pertains solely to international trade. Furthermore, export figures may include re-exports, and import figures include products exported from Quebec for processing and then re-imported.

Quebec maintains a positive trade balance with ten of the 15 countries with which it trades fishery products (see Table 23). The United Kingdom, in particular, imports more fishery products from Quebec than it exports to the province. In 1980 the trade surplus with the UK was the highest of the 15 principal countries trading sea products with Quebec ($12.2 million). By contrast, Cuba exports more than it imports from Quebec. In 1980 Quebec imported $12 million of fishery products from Cuba but made no exports to that country. The weak growth of exports to the United States during the period 1970-1980 produced a deficit trade balance in 1975 and 1980, following upon a positive balance in 1970. p. 140

TABLE 20 VALUE OF INTERNATIONAL EXPORTS OF FISHERY PRODUCTS CHARGED TO QUEBEC, BY PRINCIPAL CLIENT COUNTRIES, 1980 (IN THOUSAND CURRENT DOLLARS) p. 139

Product

Fish:
Fresh, chilled or frozen
Fresh, chilled or frozen fillets
Fresh, chilled or frozen blocks, n.a.o.
Smoked or salted and smoked
Salted and/or dried
Pickled
Canned

Shellfish:
Fresh, chilled or frozen
Canned
Other fishery products[1]
TOTAL

US
UK
France
Portugal
Federal Germany
Sweden
Italy
Netherlands
Belgium
Luxembourg
Switzerland
Total, 10 countries
Total, all countries

[1] Fish meal and oil.

SOURCE: Ibid.

TABLE 21 VALUE OF INTERNATIONAL IMPORTS OF FISHERY PRODUCTS INTO QUEBEC, 1970, 1975 AND 1980 (IN CURRENT THOUSAND DOLLARS)

Product	1970	1975	1980
Fish:			
Fresh, chilled or frozen			
Fresh, chilled or frozen sticks, blocks or portions			
Smoked or salted and smoked			
Salted and/or dried			
Pickled			
Canned			
Shellfish:			
Fresh, chilled or frozen			
Canned			
Other fishery products[1]			
TOTAL			

[1] Includes fish meal and oils.

SOURCE: La commercialisation des produits de la pêche au Québec. État de la situation, MAPAQ, March 1982.

Overall, the trade balance posted a deficit upwards of $15 million in 1975 and surpluses of $12 million and $13 million in 1970 and 1980, respectively. The main factor in the upward trend of Quebec marine product exports from 1975 to 1980 would seem to be the extension of the authorized fishing zone to 200 nautical miles.

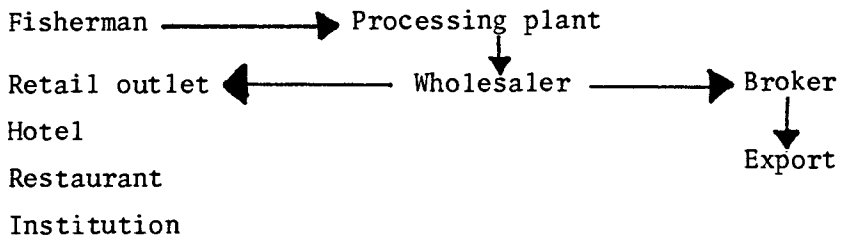
A product analysis (see Table 24) shows a positive trade balance for fresh, chilled or frozen fish blocks, fillets and portions; smoked or smoked and salted fish; salted and/or dried fish; and pickled fish. Conversely, the trade balance is negative for canned fish as well as shellfish.

(6) MARKETING

All commercial success is dependent upon the quality of marketing, which in turn determines the value of production placed on both the Quebec market and export markets. Marketing determines import volumes as well. Indeed, poor product distribution on the local market will force marketing agents to meet the demand through imports.

The complete marketing cycle for fishery products is shown in the diagram below.

FIGURE 158 MARKETING AGENTS



SOURCE: Ibid., p. 103.

Note that fishermen or processing plants may sell directly to retailers or consumers.

Distribution of fishery resources among several small enterprises and a few large ones fragments the supply and generates competition at the time of marketing.

As a rule, the product range of small producers is not very wide by comparison with large businesses, and free enterprise is thereby impeded. If a large producer is the sole supplier for a particular product, he is in a position to control the price of that product and thus corner the market. The need for strong liquidity to support long-term inventory costs--a factor vital to obtaining the best market prices--is another disadvantage for the small business. In addition, the market does not adjust to their position: the price set by small producers is determined by the interplay of supply and demand on the Boston market. Because they carry on business under unfavourable conditions, small businesses lack the budgets to promote their products and further give little attention to packaging, thereby falling short of the quality demanded by consumers.

Given that Quebec producers find it impossible to keep pace with the commercial practices of the large distribution chains, e.g., volume discounts and joint advertising, they lack access to a fairly large share of local production on the Quebec market, which is consuming increasing quantities

of fishery products but demands a high quality product.

The predominance of consumption over production and the lag of processing behind consumption explain Quebec's high import and export levels. Exports from the province are earmarked for European countries, while imports are mainly from the United States, Cuba and Japan (see Table 23, 1980).

TABLE 22 VALUE OF INTERNATIONAL IMPORTS OF FISHERY PRODUCTS INTO QUEBEC, BY TEN PRINCIPAL COUNTRIES OF ORIGIN, 1980 (IN CURRENT THOUSAND DOLLARS) p. 141

Product

Fish:
Fresh, chilled or frozen
Fresh, chilled or frozen sticks, blocks or portions
Smoked or salted and smoked
Salted and/or dried
Pickled
Canned

Shellfish:
Fresh, chilled or frozen
Canned

Other fishery products[1]

TOTAL

US
Cuba
Japan
Portugal
France
Fiji Islands
Spain
Netherlands
Norway
UK
Total, 10 countries
Total, all countries

[1] Includes fish meal and oils.

SOURCE: Ibid.

p. 142 TABLE 23 FOREIGN TRADE BALANCE OF FISHERY PRODUCTS BY PRINCIPAL COUNTRIES, QUEBEC, 1970, 1975 AND 1980 (IN THOUSAND CURRENT DOLLARS)

Country	Foreign exports			Foreign imports			Trade balance		
	1970	1975	1980	1970	1975	1980	1970	1975	1980
US									
UK									
France									
Portugal									
Federal Germany									
Sweden									
Italy									
Netherlands									
Belgium-Luxembourg									
Switzerland									
Cuba									
Japan									
Fiji Islands									
Spain									
Norway									
Total, 15 countries[1]									
Total, all countries									

[1] Principal importing or exporting countries in 1980.

SOURCE: Ibid.

TABLE 24 FOREIGN TRADE BALANCE OF FISHERY PRODUCTS BY PRODUCT TYPE, QUEBEC, 1970, 1975 AND 1980 (IN CURRENT THOUSAND DOLLARS)

Product	Foreign exports from Quebec			Foreign imports to Quebec			Trade balance		
	1970	1975	1980	1970	1975	1980	1970	1975	1980
Fish:									
Fresh, chilled or frozen									
Fresh, chilled or frozen blocks, fillets or portions									
Smoked or salted and smoked									
Salted and/or dried									
Pickled									
Canned									
Shellfish:									
Fresh, chilled or frozen									
Canned									
Other fishery products									
TOTAL									

SOURCE: Ibid.

APPENDIX

TABLE A.1 SUMMARY TABLE: PERCENTAGE RANKING OF MARITIME REGIONS RELATIVE TO QUEBEC

	MARITIME REGIONS					
	St. Lawrence	Northern Gaspé	Southern Gaspé	Western North Shore	Eastern North Shore	Magdalen Islands
PRIMARY SECTOR						
(1) Landings (1983)						
Totals - Quantity (%)						
- Value (%)						
Main species fished	Turbot	Cod	Cod	Cod	Cod	Redfish
	Crab	Redfish	Herring	Herring	Herring	Crab
	Capelin	Plaice	Lobster	Crab	Crab	Lobster
	Eel	Shrimp	Crab	Shrimp	Lobster	Mackerel
(2) Fishermen (1983)						
Number (%)						
(3) Fleet (1983)						
Vessels (%)						
SECONDARY SECTOR						
(1) Plants[1] (Employed (%), 1983)						
(2) Work force (Person-years (%), 1982)						
FISHING COMMUNITIES						
Number (%), 1983						

[1] 7.4% of plants are located in regions not included in this table.

TABLE A.2 NUMBER OF ESTABLISHMENTS HAVING FISH PROCESSING AS THEIR MAIN ACTIVITY, NUMBER EMPLOYED, WAGES, TOTAL VALUE ADDED AND TOTAL VALUE OF SHIPMENTS, QUEBEC, MARITIME PROVINCES AND CANADA, 1970, 1977-1982

		1970	1977	1978	1979	1980	1981	1982
Number of establishments	Quebec							
	Maritimes							
	Canada							
Number of production workers	Quebec							
	Maritimes							
	Canada							
Wages ($'000) (production workers)	Quebec							
	Maritimes							
	Canada							
Total value added[1] ($'000)	Quebec							
	Maritimes							
	Canada							
Total value of shipments[2] ($'000)	Quebec							
	Maritimes							
	Canada							

SOURCE: Statistics Canada, Cat. 32-216.

[1] GNP index, base = 1981.

[2] Fish products industry sales price index, base = 1981.

TABLE A.3 LANDINGS AND LANDED VALUE OF MAIN SPECIES, QUEBEC, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Turbot									
Herring									
Mackerel									
Salmon									
Smelt									
Capelin									
Eel									
Shrimp									
Lobster									
Crab									
Clam									
Scallop									
Whelk									
Halibut									
Total, main species									
Total, all species									
Harp seal (number)									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.4 LANDINGS AND LANDED VALUE OF MAIN SPECIES, ST. LAWRENCE, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Turbot									
Herring									
Crab									
Smelt									
Capelin									
Eel									
Total, main species									
Total, all species									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.5 LANDINGS AND LANDED VALUE OF MAIN SPECIES, NORTHERN GASPE, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Turbot									
Herring									
Crab									
Shrimp									
Total, main species									
Total, all species									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.6 LANDINGS AND LANDED VALUE OF MAIN SPECIES, SOUTHERN GASPE, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Herring									
Turbot									
Lobster									
Crab									
Total, main species									
Total, all species									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.7 LANDINGS AND LANDED VALUE OF MAIN SPECIES, WESTERN NORTH SHORE, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Turbot									
Herring									
Whelk									
Crab									
Halibut									
Shrimp									
Salmon									
Clam									
Total, main species									
Total, all species									
Harp seal (number)									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.8 LANDINGS AND LANDED VALUE OF MAIN SPECIES, EASTERN NORTH SHORE, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Scallop									
Herring									
Crab									
Lobster									
Salmon									
Total, main species									
Total, all species									
Harp seal (number)									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.9 LANDINGS AND LANDED VALUE OF MAIN SPECIES, MAGDALEN ISLANDS, 1970, 1977-1983 (IN METRIC TONS AS LANDED AND CURRENT DOLLARS)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Crab									
Herring									
Lobster									
Scallop									
Mackerel									
Total, main species									
Total, all species									
Harp seal (number)									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.10 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN QUEBEC, QUEBEC, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Turbot									
Herring									
Mackerel									
Salmon									
Smelt									
Capelin									
Eel									
Shrimp									
Lobster									
Crab									
Clam									
Scallop									
Whelk									
Halibut									
Total, inventoried species as percentage of all species									

[1] Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.11 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN THE REGION, ST. LAWRENCE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Turbot									
Herring									
Crab									
Smelt									
Capelin									
Eel									

TABLE A.12 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN THE REGION, NORTHERN GASPE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Turbot									
Herring									
Crab									
Shrimp									
Total, inventoried species as percentage of all species									

[1] Under 0.55%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.13 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN THE REGION, SOUTHERN GASPE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Herring									
Turbot									
Lobster									
Crab									
Total, inventoried species as percentage of all species									

[1] Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.14 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN THE REGION, WESTERN NORTH SHORE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Turbot									
Herring									
Whelk									
Crab									
Halibut									
Shrimp									
Salmon									
Clam									
Total, inventoried species as percentage of all species									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.15 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN THE REGION, EASTERN NORTH SHORE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Scallop									
Herring									
Crab									
Lobster									
Salmon									
Total, inventoried species as percentage of all species									

[1] Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.16 LANDINGS AND LANDED VALUE OF MAIN SPECIES AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE IN THE REGION, MAGDALEN ISLANDS, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Crab									
Herring									
Lobster									
Scallop									
Mackerel									
Total, inventoried species as percentage of all species									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.17 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN THE REGION AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE OF THE SAME SPECIES IN QUEBEC, ST. LAWRENCE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Turbot									
Herring									
Crab									
Smelt									
Capelin									
Eel									
Total									

[1] Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.18 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN THE REGION AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE OF THE SAME SPECIES IN QUEBEC, NORTHERN GASPE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Turbot									
Herring									
Crab									
Shrimp									
Total									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.19 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN THE REGION AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE OF THE SAME SPECIES IN QUEBEC, SOUTHERN GASPE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Herring									
Turbot									
Lobster									
Crab									
Total									

[1] Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.20 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN THE REGION AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE OF THE SAME SPECIES IN QUEBEC, WESTERN NORTH SHORE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Turbot									
Herring									
Whelk									
Crab									
Halibut									
Shrimp									
Salmon									
Clam									
Total									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.21 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN THE REGION AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE OF THE SAME SPECIES IN QUEBEC, EASTERN NORTH SHORE, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Scallop									
Herring									
Crab									
Lobster									
Salmon									
Total									

[1] Under 0.05%.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.22 LANDINGS AND LANDED VALUE OF MAIN SPECIES IN THE REGION AS PERCENTAGE OF TOTAL LANDINGS AND LANDED VALUE OF THE SAME SPECIES IN QUEBEC, MAGDALEN ISLANDS, 1970, 1977-1983

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Quantity	Value							
Cod									
Redfish									
Sole									
Crab									
Herring									
Lobster									
Scallop									
Mackerel									
Total									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.23 LANDED PRICES OF MAIN SPECIES AND PRICE INDEXES, QUEBEC, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Curr. price	Index							
Cod									
Redfish									
Sole									
Turbot									
Herring									
Mackerel									
Salmon									
Smelt									
Capelin									
Eel									
Shrimp									
Lobster									
Crab									
Clam									
Scallop									
Whelk									
Halibut									
Canadian consumer price index (CPI)[1]									
Canadian food price index (excl. restaurants)									
Canadian fish price index[1]									

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.24 LANDED PRICES OF MAIN SPECIES IN THE REGION AND PRICE INDEXES, ST. LAWRENCE, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Price	Index							
Cod									
Turbot									
Herring									
Crab									
Smelt									
Capelin									
Eel									
Canadian consumer price index (CPI)[1]									
Canadian food price index (excl. restaurants)									
Canadian fish price index[1]									

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.25 LANDED PRICES OF MAIN SPECIES IN THE REGION AND PRICE INDEXES, NORTHERN GASPE, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970	1977	1978	1979	1980	1981	1982	1983
	Price	Index						
Cod								
Redfish								
Sole								
Turbot								
Herring								
Crab								
Shrimp								
Canadian consumer price index (CPI)[1]								
Canadian food price index (excl. restaurants)								
Canadian fish price index[1]								

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.26 LANDED PRICES OF MAIN SPECIES IN THE REGION AND PRICE INDEXES, SOUTHERN GASPE, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Price	Index							
Cod									
Redfish									
Sole									
Herring									
Turbot									
Lobster									
Crab									
Canadian consumer price index (CPI)[1]									
Canadian food price index (excl. restaurants)									
Canadian fish price index[1]									

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.27 LANDED PRICES OF MAIN SPECIES IN THE REGION AND PRICE INDEXES, WESTERN NORTH SHORE, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Price	Index							
Cod									
Redfish									
Turbot									
Herring									
Whelk									
Crab									
Halibut									
Shrimp									
Salmon									
Clam									
Canadian consumer price index (CPI)[1]									
Canadian food price index (excl. restaurants)									
Canadian fish price index[1]									

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.28 LANDED PRICES OF MAIN SPECIES IN THE REGION AND PRICE INDEXES, EASTERN NORTH SHORE, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970	1977	1978	1979	1980	1981	1982	1983
	Price							
Cod								
Redfish								
Scallop								
Herring								
Crab								
Lobster								
Salmon								
Canadian consumer price index (CPI)[1]	Index							
Canadian food price index (excl. restaurants)								
Canadian fish price index[1]								

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.29 LANDED PRICES OF MAIN SPECIES IN THE REGION AND PRICE INDEXES, MAGDALEN ISLANDS, 1970, 1977-1983 (IN CURRENT DOLLARS/KG)

Species	1970		1977	1978	1979	1980	1981	1982	1983
	Price	Index							
Cod									
Redfish									
Sole									
Crab									
Herring									
Lobster									
Scallop									
Mackerel									
Canadian consumer price index (CPI)[1]									
Canadian food price index (excl. restaurants)									
Canadian fish price index[1]									

[1] Statistics Canada, Catalogues 62-001 and 62-010.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.30 NUMBER OF FISHERMEN BY REGION AND AS PERCENTAGE OF ALL FISHERMEN IN QUEBEC, 1970, 1977-1983

Region	1970		1977	1978	1979	1980	1981	1982	1983
	Number	%							
St. Lawrence									
Northern Gaspé									
Southern Gaspé									
Western North Shore									
Eastern North Shore									
Magdalen Islands									
Quebec									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.31 DISTRIBUTION OF FISHERMEN BY NUMBER OF DAYS DEVOTED TO FISHING, BY REGION, 1981

Number of fishing days	Number of fishermen					
	St. Lawrence	Northern Gaspé	Southern Gaspé	Western North Shore	Eastern North Shore	Magdalen Islands

SOURCE: BSQ, Rapport 02, Tableau selon les classes de districts du nombre de pêcheurs selon le nombre de jours de pêche, 1981.

TABLE A.32 DISTRIBUTION OF FISHERMEN BY PROPORTION OF INCOME DERIVED FROM FISHING RELATIVE TO TOTAL INCOME, BY REGION, 1981

Region	% of total income
St. Lawrence	
Northern Gaspé	
Southern Gaspé	
Western North Shore	
Eastern North Shore	
Magdalen Islands	
Quebec	

SOURCE: BSQ, Rapport 01, Tableau selon les classes de districts concernant le pourcentage du revenu total, 1981.

TABLE A.33 DECLARED FISHING METHOD* OF VESSELS 10 TONS AND OVER, QUEBEC, 1970, 1977-1983

Fishing method
Trawl
Gillnet
Longline
Scallop dragger
Pelagic trawl
Crab traps[1]
Other

* N.B. A vessel may declare more than one fishing method.

[1] Compiled from 1981 on.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.34 NUMBER OF FISHING VESSELS BY LENGTH, QUEBEC, 1970, 1977-1983

Year

Motorized craft

- Under 6 metres (20 ft)
- 6 to 7.5 metres (20-24 ft)
- 7.6 to 9 metres (25-29 ft)
- 9.1 to 10.5 metres (30-34 ft)
- 10.6 to 12.1 metres (35-39 ft)
- 12.2 to 13.6 metres (40-44 ft)
- 13.7 to 19.7 metres (45-64 ft)
- 19.8 to 27.3 metres (65-89 ft)
- 27.4 to 30.4 metres (90-99 ft)
- 30.5 metres (100 ft) and over

Total

Non-motorized craft

Grand total

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

(The text for all the tables on this page is the same as for Table A.34)

TABLE A.35 NUMBER OF FISHING VESSELS BY LENGTH, ST. LAWRENCE, 1970, 1977-1983

TABLE A.36 NUMBER OF FISHING VESSELS BY LENGTH, NORTHERN GASPE, 1970, 1977-1983

TABLE A.37 NUMBER OF FISHING VESSELS BY LENGTH, SOUTHERN GASPE, 1970, 1977-1983

TABLE A.38 NUMBER OF FISHING VESSELS BY LENGTH, WESTERN NORTH SHORE, 1970, 1977-1983

TABLE A.39 NUMBER OF FISHING VESSELS BY LENGTH, EASTERN NORTH SHORE, 1970, 1977-1983

TABLE A.40 NUMBER OF FISHING VESSELS BY LENGTH, MAGDALEN ISLANDS, 1970, 1977-1983

TABLE A.41 NUMBER OF FISHING VESSELS BY REGION AND IN QUEBEC, 1970, 1977-1983

Region	1970		1977	1978	1979	1980	1981	1982	1983
	Number	%							
St. Lawrence									
Northern Gaspé									
Southern Gaspé									
Western North Shore									
Eastern North Shore									
Magdalen Islands									
Quebec (total)									

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.42 PERCENTAGE DISTRIBUTION OF FISHING VESSELS BY LENGTH, BY REGION, 1970, 1977-1983

Length

Under 7.6 m (under 24.11 ft)
7.6 to 10.5 m (25-34.11 ft)
10.6 to 13.6 m (35-44.11 ft)
13.7 to 19.7 m (45-64.11 ft)
19.8 to 30.4 m (65-99.11 ft)
30.5 m (100 ft) and over

Non-motorized craft

Total

Quebec

St. Lawrence
Northern Gaspé
Southern Gaspé
Western North Shore
Eastern North Shore
Magdalen Islands

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.43 NUMBER OF FISHING VESSELS BY TONNAGE, QUEBEC, 1970, 1977-1983

Year

Tonnage (in tons[1])

Under 10

10.0 to 24.9

25.0 to 49.9

50.0 to 99.9

100.0 to 149.9

150 and over

Total

[1] 1 ton = 100 cubic feet = 2.831865 cubic metres

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983

(The text for all the tables on this page is the same as for Table A.43)

TABLE A.44 NUMBER OF FISHING VESSELS BY TONNAGE, ST. LAWRENCE, 1970, 1977-1983

TABLE A.45 NUMBER OF FISHING VESSELS BY TONNAGE, NORTHERN GASPE, 1970, 1977-1983

TABLE A.46 NUMBER OF FISHING VESSELS BY TONNAGE, SOUTHERN GASPE, 1970, 1977-1983

TABLE A.47 NUMBER OF FISHING VESSELS BY TONNAGE, WESTERN NORTH SHORE, 1970, 1977-1983

TABLE A.48 NUMBER OF FISHING VESSELS BY TONNAGE, EASTERN NORTH SHORE, 1970, 1977-1983

TABLE A.49 NUMBER OF FISHING VESSELS BY TONNAGE, MAGDALEN ISLANDS, 1970, 1977-1983

TABLE A.50 PERCENTAGE DISTRIBUTION OF FISHING VESSELS BY TONNAGE, BY REGION, 1970, 1977-1983

Tonnage class

Under 10 tons
10.0 to 24.9 tons
25.0 to 49.9 tons
50.0 to 99.9 tons
100.0 to 149.9 tons
150 tons and over

Total

Quebec
St. Lawrence
Northern Gaspé
Southern Gaspé
Western North Shore
Eastern North Shore
Magdalen Island

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.51 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, QUEBEC, 1984

Length

35 to 44.11 ft

45 to 59.11 ft

60 ft and over

Total

Pre 1955

1955-1959

1960-1964

1965-1969

1970-1974

1975-1979

1980 and after

Unknown

Total

SOURCES: - Nomenclature of Vessels, 1984, Transport Canada.

- "Technical Data Sheets on Vessels," Licence Division, Department of Fisheries and Oceans.

(The text for all the tables on this page is the same as for Table A.51)

TABLE A.52 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, ST. LAWRENCE, 1984

TABLE A.53 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, NORTHERN GASPE, 1984

TABLE A.54 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, SOUTHERN GASPE, 1984

TABLE A.55 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, WESTERN NORTH SHORE, 1984

TABLE A.56 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, EASTERN NORTH SHORE, 1984

TABLE A.57 NUMBER OF FISHING VESSELS BY YEAR OF CONSTRUCTION, MAGDALEN ISLANDS, 1984

TABLE A.58 PERCENTAGE DISTRIBUTION OF FISHING VESSELS BY LENGTH AND YEAR OF CONSTRUCTION, BY REGION, 1984

Length	Pre 1955	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980 and after	Unknown	Total
Quebec									
35-44.11 ft									
45-59.11 ft									
60 ft and over									
St. Lawrence									
35-44.11 ft									
45-59.11 ft									
60 ft and over									
Northern Gaspé									
35-44.11 ft									
45-59.11 ft									
60 ft and over									
Southern Gaspé									
35-44.11 ft									
45-59.11 ft									
60 ft and over									
Western North Shore									
35-44.11 ft									
45-59.11 ft									
60 ft and over									
Eastern North Shore									
35-44.11 ft									
45-59.11 ft									
60 ft and over									
Magdalen Islands									
35-44.11 ft									
45-59.11 ft									
60 ft and over									

SOURCES: - Nomenclature of Vessels, Transport Canada.

- "Technical Data Sheets on Vessels," Licence Division, Department of Fisheries and Oceans.

TABLE A.59 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, QUEBEC, 1970, 1977-1983 (IN DOLLARS)

	Investment under 10 tons		Investment over 10 tons		Gear expenditure	
Year	Current	Constant[1]	Current	Constant	Current	Constant

[1] General price index, base = 1981.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1981.

(The text for all the tables on this page is the same as for Table A.59)

TABLE A.60 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, ST. LAWRENCE, 1970, 1977-1981 (IN DOLLARS)

TABLE A.61 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, NORTHERN GASPE, 1970, 1977-1981 (IN DOLLARS)

TABLE A.62 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, SOUTHERN GASPE, 1970, 1977-1981 (IN DOLLARS)

TABLE A.63 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, WESTERN NORTH SHORE, 1970, 1977-1981 (IN DOLLARS)

TABLE A.64 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, EASTERN NORTH SHORE, 1970, 1977-1981 (IN DOLLARS)

TABLE A.65 INVESTMENT IN FISHING VESSELS AND GEAR EXPENDITURE, MAGDALEN ISLANDS, 1970, 1977-1981 (IN DOLLARS)

TABLE A.66 TOTAL AND AVERAGE VALUES OF FISHING VESSELS BY LENGTH, QUEBEC, 1983 (IN CURRENT DOLLARS)

Vessel length	%	Number	%	Total value	Average value
Under 7.6 m[1] (under 25 ft)					
7.6 m-10.5 m (25-34.11 ft)					
10.6 m-13.6 m (35-44.11 ft)					
13.7 m-19.7 m (45-64.11 ft)					
19.8 m-30.4 m (65-99.11 ft)					
30.5 m and over (100 ft and over)					
TOTAL					

[1] Including non-motorized craft.

SOURCE: BSQ, Pêche commerciale, 1983.

TABLE A.67 TOTAL AND AVERAGE VALUES OF FISHING VESSELS BY TONNAGE, QUEBEC, 1970, 1977-1983 (IN DOLLARS)

Year	Under 10 tons[1]			
	Total value		Average value	
	Current	Constant	Current	Constant
No				

Year	10.0 to 24.9 tons			
	Total value		Average value	
	Current	Constant	Current	Constant
No				

Year	25.0 to 49.9 tons			
	Total Value		Average value	
	Current	Constant	Current	Constant
No				

TABLE A.67 (concluded) TOTAL AND AVERAGE VALUES OF FISHING VESSELS BY TONNAGE, QUEBEC, 1970, 1977-1983 (IN DOLLARS)

Year	50.0 to 99.0 tons			
	Total value		Average value	
	Current	Constant	Current	Constant
No				

Year	100.0 to 149.9 tons			
	Total value		Average value	
	Current	Constant	Current	Constant

No

150 tons and over			
Total value		Average value	
Current	Constant	Current	Constant

No

Total			
Total value		Average value	
Current	Constant	Current	Constant

[1] Including non-motorized craft.

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1983.

TABLE A.68 AVERAGE INCOME AND EXPENSES BY VESSEL CLASS, QUEBEC, 1982
(IN CURRENT DOLLARS)

	Draggers 18 m (approx. 59 ft)	Trawlers 18 m (approx. 59 ft)	Trawlers 20 m (approx. 65 ft)	Trawlers 25 m (approx. 82 ft)
Fish sales				
Expenses				
Maintenance: hull, motor, winch, electronics				
Fishing gear				
Winter lay-up and licences				
Occupational Health and Safety Board				
Insurance				
Sub-total, vessel				
Fuel				
Ice				
Provisions				
Unloading				
Bait				
Sub-total, crew				
Sub-total, expenses (vessel and crew)				
Net share of crew*				
Net share of vessel				
Less depreciation				
Net profit after depreciation				
Net share of vessel				
Less repayment to treasury				
Less other repayments				

Final balance in hand

---

* Including captain's share.

SOURCE: BSQ, Les chalutiers et les cordiers du Québec, 1982.

N.B.: The figures in this table are derived from the average for each item (see Tables 5 to 9 of reference publication), which explains why the totals do not add.

TABLE A.69 NUMBER OF CENSUS PROCESSING PLANTS[1] BY REGION, 1977-1983

Region	1977	1978	1979	1980	1982	1983
St. Lawrence						
Northern Gaspé						
Southern Gaspé						
Western North Shore						
Eastern North Shore						
Magdalen Islands						
Other regions						
Total						

[1] Plants holding a federal registration certificate.

SOURCE: Inspection Service, Department of Fisheries and Oceans.

TABLE A.70 MONTHLY WORK FORCE IN FISH PROCESSING PLANTS, QUEBEC, 1970, 1977-1982

Year	
	January
	February
	March
	April
Average	May
	June
	July
	August
	September
	October
	November
	December
	Person-years

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1982.

TABLE A.71 MONTHLY WORK FORCE IN FISH PROCESSING PLANTS, BY REGION, 1970, 1977-1982

Region	January
	February
St. Lawrence	March
Average	April
	May
Northern Gaspé	June
Average	July
	August
Southern Gaspé	September
Average	October
	November
	December
	Person-years

TABLE A.71 (concluded) MONTHLY WORK FORCE IN FISH PROCESSING PLANTS, BY REGION, 1970, 1977-1982

Region	January
	February
Western North Shore	March
Average	April
	May
Eastern North Shore	June
Average	July
	August
Magdalen Islands	September
Average	October
	November
	December

SOURCE: BSQ, Pêche commerciale, 1970, 1977-1982.

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