
**ECONOMIC SURVEY RESULTS
OF CRABBERS' EXPLOITATION IN AREA 15
1998-2000**

QUEBEC REGION



Fisheries and Oceans Canada

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SUMMARY

The overall financial situation of Area 15 crabbers' fleet improved markedly in 2000. The noticeable increase of gross income in the fishing businesses could be mainly explained by rising snow crab prices in 2000. As for expenditures, labour-related costs were those which by far increased the most. Finally, cash flow income more than doubled in 2000 settling well above the \$102,000 mark in average for this fleet. Furthermore, one should take into consideration that this is an aging fleet of vessels (16 years in average), a factor which would probably require new investments in the near future.

ACKNOWLEDGEMENTS

We would like to extend our heartfelt thanks to all the fishermen who agreed to take part in the survey. Without their collaboration, this study would never have taken place. Considering this, it is important to stress that all the fishermen selected for inclusion in the sample population agreed to take part in the survey on an entirely voluntary basis. Also, we would like to stress how much we appreciate the collaboration we received from fishermen's associations and their representatives, which made our work much easier.

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INTRODUCTION

The Policy and Economics Branch of the Department of Fisheries and Oceans, Quebec Region, carried out this survey on the expenses incurred and income earned by Area 15 snow crab fishermen for the years 1999 and 2000. The average cash flow income, the main characteristics and the economic break-even point are described herein. The current survey is an updated version of the document "Study on the Exploitation Results of Area 15 Crabbers" which focused on the year 1998. The results of the latter study are appended to this document for comparison purpose.

This type of survey carries special significance as it leads to a better understanding of what is at stakes at the socioeconomic level and helps understand the financial characteristics of snow crab fishing fleets.

1. Methodology

This study is the result of a survey carried out with Area 15 crabbers in 2001. This crabbers' fishing area is shown in Annex 1. The methodology used to carry out this study is described in the next section.

1.1 Data Collection

Eight Quebec crabbers operate in Area 15 and five of them were interviewed for the purpose of this study. To make researchers' work easier and generate a high response rate, an explanatory letter of introduction was sent to randomly-selected businesses. Interviews with fishermen were conducted by two researchers who spread their work accordingly over the geographical regions of the sample. Collecting the data lasted from September to December 2001.

The survey was carried out using a questionnaire developed by the Department. This questionnaire asked all the information required to carry out the study. It is important to underscore the confidential nature of such information and also that results discussed in this report merely display averages. The main data collected after processing the questionnaire are described in Annex 2.

1.2 Data Validation

A few minor corrections were made after validating the data by comparing some deviations with the fleet average and by "cross-checking" with field-researchers in order to detect possible inconsistencies.

2. Results and Analysis

2.1 Cash Flow

Table 1 shows the average gross income and average operating costs incurred in 1999 and 2000 for the entire sample. These data were used to compute the average cash flow for each of the years under study. The cash flow is the calculation of a financial result which takes into account annual incomes earned and disbursements made by the fishing businesses. This financial result does not take asset depreciation into account (since it is not disbursed) but rather takes into account any loan reimbursement made during the year. Consequently, this cash flow represents the amount of capital available for the owner to be paid for his work and to make a business profit after all expenses have been met.

The cash flow may sometimes be overestimated. Actually, some expenditures such as maintenance costs may be financed through loans or funds from previous years, which does not generate any capital outflow in the current year. The calculation of the cash flow that follows takes into account the hypothesis which holds that all the owner's obligations have been met during the year (with the exception of the financial expenses for which effective payment is considered). The cash flow can therefore be computed as follows:

$$\begin{aligned} \text{OVERALL INCOME } \textit{minus} & \quad - \text{ variable operating costs } (\textit{details in Annex 1}) \\ & \quad - \text{ fixed operating costs } (\textit{details in Annex 1}) \end{aligned}$$

The **overall income** represents the sum total of incomes generated by fish sales and other incomes associated with the fishing business operations.

Variable operating costs represent expenditures with direct links to fishing activities as well as variable costs related to the use of assets other than the vessel, such as vehicles, facilities and equipment. In the case of Area 15 snow crab fishermen, labour costs are considered as variable charges.

Gear-related expenses include the net acquisition of fishing gears (purchase minus sales) as well as maintenance costs and gear repairs.

Maintenance costs include all costs incurred to maintain business assets in fine working condition, which includes vehicles, facilities and equipment used on land. However, they do not include expenditures associated with the maintenance and repair of fishing gear.

Fixed operating costs include annual fixed expenses associated with equipment and facilities such as financial expenses, insurance and licences.

Results displayed on Table 1 reveal that the average cash flow amounted to \$49,349 in 1999 and \$102,648 in 2000. Gross income in the fisheries reached \$198,775 in 1999 and soared up in 2000 reaching \$275,963, mainly because of increasingly higher snow crab landing prices.

An examination of the structure of operating costs reveals that the highest costs were labour costs. These charges totaled \$106,167 in 1999 and \$139,173 in 2000. This represented more than 71% of the overall operating costs in 1999 and 80% in 2000. Also, it should be noted that, compared to 1999, the value of these charges increased by nearly 31% in 2000 compared to 1999. Such an increase arose from the fact that a large portion of the labour force costs varied with the business gross income. Besides, there were repair and maintenance costs. The latter amounted to \$8,488 in 1999 and \$6,378 in 2000.

Table 1
Cash Flow and Structure of Operating Costs
Area 15 Crabbers

	1998		1999		2000	
	(\$)	Share in %	(\$)	Share in %	(\$)	Share in %
INCOME						
<i>Gross income</i>						
Fishing gross income	159,185	-	198,775	-	275,963	-
Other income	0	-	0	-	0	-
Overall income	159,185		198,775		275,963	
OPERATING COSTS						
<i>Variable costs</i>						
Labour	81,487	71	106,167	71	139,173	80
Fuel, oil and grease	3,489	3	4,213	3	3,365	2
Fishing gear	2,238	2	4,135	3	1,732	1
Maintenance	1,394	1	8,488	6	6,378	4
Others (vehicle-related expenses, dockside monitoring, etc.)	13,875	12	8,381	5	6,719	4
Subtotal:	102,483	89	131,384	88	157,367	91
<i>Fixed costs</i>						
Financial expenses	4,184	4	7,639	5	4,934	3
Insurance	1,511	1	1,700	1	1,728	1
Others (registration, licence, association, etc.)	7,110	6	8,703	6	9,286	5
Subtotal:	12,805	11	18,042	12	15,948	9
Overall operating costs:	115,287	100	149,426	100	173,315	100
CASH FLOW:	43,898		49,349		102,648	

Sources: Fishermen Sample Survey and DFO data (gross fishing income)

Since cash flow does not take into account other incomes such as Employment Insurance income, Table 2 shows the owner's overall income.

Table 2
Owners' Overall Average Income
Area 15 Crabbers

	1998	1999	2000
Cash flow	43,898	49,349	102,648
Employment Insurance	12,839	9,619	10,125
<i>Total</i>	<i>56,737</i>	<i>58,968</i>	<i>112,773</i>

Sources: Fishermen Sample Survey and DFO data (gross fishing income)

As can be seen thereon, the owners' income generated by snow crab fishing businesses in Area 15 reached \$58,968 in 1999 and \$112,773 in 2000. It should be noted that the income originating from Employment Insurance went up from \$9,619 in 1999 to \$10,125 for the year 2000. Therefore, an increase of the average owners' income mostly arose from a \$53,299 increase in the cash flow.

2.2 Structure of Landings

Table 3
Structure of Average Landing
Area 15 Crabbers

	Average Landings (\$)	Average Landings (kg)	Average Landing Price (\$/kg)
1999			
Snow crab	190,322	50,192	3.79
Cod	641	620	1.03
Greenland halibut	7,419	3,609	2.06
Atlantic halibut	243	35	6.94
Others	150	181	-
Total	198,775	54,637	-
2000			
Snow crab	274,195	51,822	5.29
Cod	490	510	0.96
Greenland halibut	1,066	508	2.10
Atlantic halibut	83	12	6.92
Others	129	170	-
Total	275,963	53,022	-

Sources: Fishermen Sample Survey and DFO data (gross fishing income)

Total landings (including all species) were estimated at \$198,775 in 1999 and \$275,963 in 2000. Such landings represented an overall volume of 54.6 tonnes in 1999 and about 53.0 tonnes in 2000. These figures represented about a 1% volume decrease. This represented a diminution of the landed volume by roughly 3%.

Snow crab landings, which represented more than 96% of the total landings in 1999 and 99% in 2000, were worth \$190,322 in 1999 and \$274,195 in 2000. The landed volume of snow crab increased by more than 3% rising from 50,192 kg in 1999 to 51,822 kg in 2000. Besides, a price increase of more than 39% in 2000 allowed an increase of 44% of snow crab landings in value.

As far as secondary species are concerned, one should point out to that income generated by Greenland halibut, cod and Atlantic halibut decreased 80% in 2000. In volume, this roughly represented a 76% decline.

2.3 Technico-Economic Characteristics of Area 15 Crabbers

Table 4
Technico-Economic Characteristics of Area 15 Crabbers
(Average Values)

Description	1999	2000
Average fleet age	15	16
Vessel average length	36'06''	36'06''
Duration of fishing season (weeks)	12.2	12.2
Size of crew	4.0	4.6
Vessel initial purchase price	\$87,000	\$87,000
Purchase price of assets on land	\$2,900	\$10,060
Major additions or modifications	\$13,707	\$18,782
Depreciation	\$49,863	\$56,159
Value of assets on December 31 st	\$53,744	\$59,684
Balance of loans	\$24,059	\$30,472
<i>Debts/Assets ratio</i>	<i>0.45</i>	<i>0.51</i>

Sources: Fishermen Sample Survey

The fishing season for Area 15 crabbers lasted over a period of 12.2 weeks in 1999 and 2000. The size of the fishing crew recorded a slight increase in 2000 rising from 4.0 in 1999 to 4.6, excluding the captain-owner.

The fleet under study is a relatively aging fleet. As a matter of fact, the average age of the vessels is over 16 years. One should also note that the value of assets on land increased together with the value of major considerable additions or modifications then being made, which generated a 11% increase in the value of assets. In the year 2000, these assets totaled \$59,684.

It is possible to determine the proportion of business debts against business assets by calculating the **debts/assets** ratio. The average ratio thus stood at around 0.45 in 1999 and 0.51 in 2000, which meant that the debts incurred represented about 45% of the value of the assets in 1999 and 51% in 2000. Such a rise may be explained by the growing debts incurred by these businesses which by far offset the growth of their assets.

2.4 Economic Break-Even Point

The following Table displays the quantities of snow crab needed to reach the economic break-even point for Area 15 crabbers. The economic break-even point¹ is also called the "treshold of profitability". In this case, the economic break-even point allows the computation of the quantities of snow crab needed to meet all the average charges (operating costs) incurred by the fleet. Any additional quantity of snow crab therefore allows the captain-owner to be paid a salary and a profit.

¹ The economic break-even point takes fixed and variable costs into account and is computed as follows:

$$ECONOMIC\ BREAK-EVEN\ POINT = \frac{FC}{MBFC}$$

Where: FC = fixed costs or charges (\$)

$$MBFC = \text{margin before fixed charges} = 1 - \frac{VC}{\text{Landings}}$$

VC = variable costs or charges (\$)

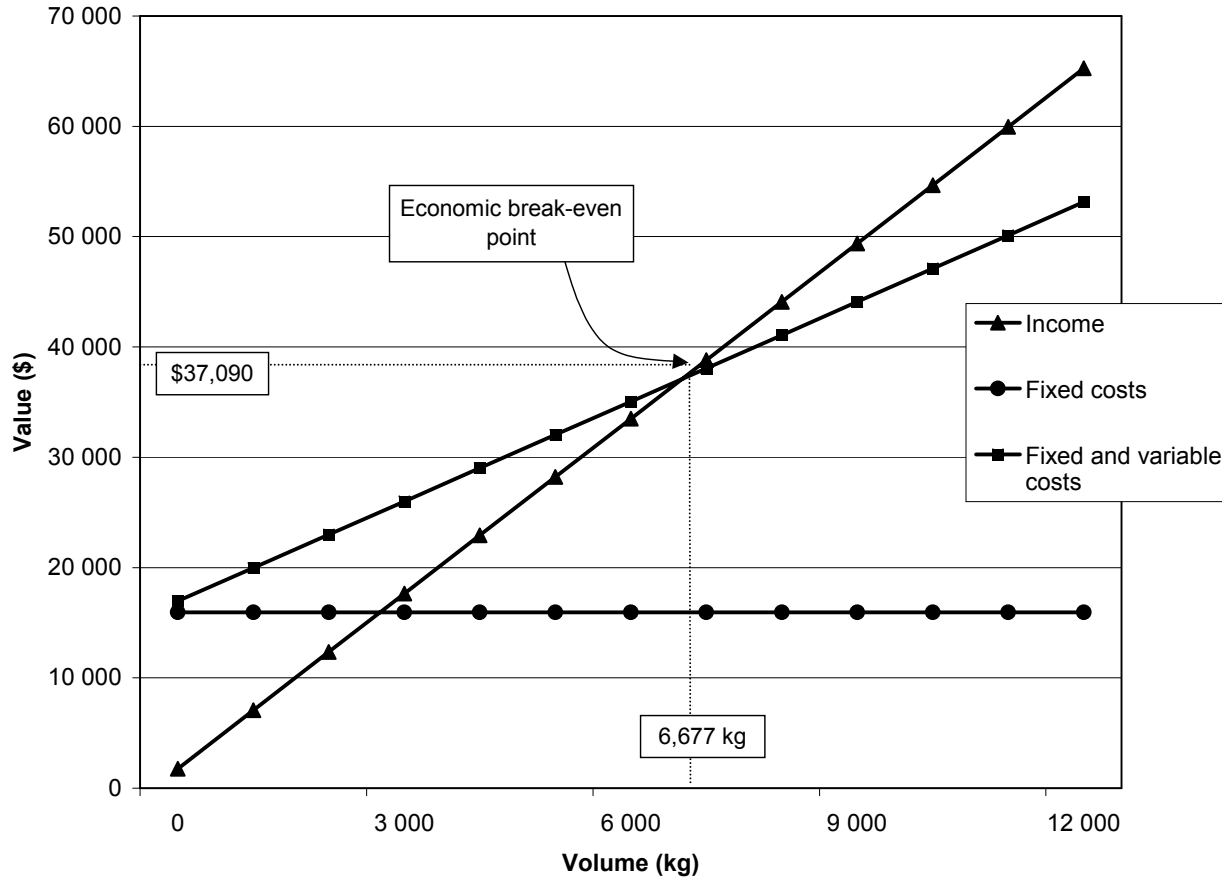
Table 5
Quantities of Crab Needed to Reach the Economic Break-Even Point
Area 15 Crabbers

	<i>Unit</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>
FIXED COSTS (FC)	\$	12,805	18,042	15,948
Variable costs (VC)	\$	102,482	131,384	157,367
Overall landings (all species)	\$	159,185	198,775	275,963
Variable costs / Overall landings	\$	0.64	0.66	0.57
MARGIN BEFORE FIXED CHARGES (MBFC)	\$	0.36	0.34	0.43
ECONOMIC BREAK-EVEN POINT (Overall landings)	\$	35,949	53,065	37,088
<i>LANDINGS OF CRAB NEEDED TO REACH THE ECONOMIC BREAK-EVEN POINT</i>	<i>Kg</i> <i>(lb)</i>	<i>10,147</i> <i>(22,370)</i>	<i>11,771</i> <i>(25,951)</i>	<i>6,677</i> <i>(14,720)</i>
ACTUAL CRAB LANDINGS MINUS THE ECONOMIC BREAK-EVEN POINT	<i>Kg</i> <i>(lb)</i>	38,834 (85,614)	38,421 (84,704)	45,145 (99,528)

Note: The calculation of the economic break-even point holds as hypothesis that landings should be constant for all the other species fished

Variable costs represented 57% of the overall landed value (variables costs/total landings). Therefore \$0.43 per landed dollar was left to cover fixed costs (margin before fixed charges). In order to reach the economic break-even point, Area 15 crabbers had to land 6,677 kg (14,720 lb) of snow crab in 2000, which was lower than the quantities they actually landed. In fact, crabbers landed sufficiently large amounts of snow crab to reach the economic break-even point thus ensuring the payment of a salary and a profit to the captain-owner.

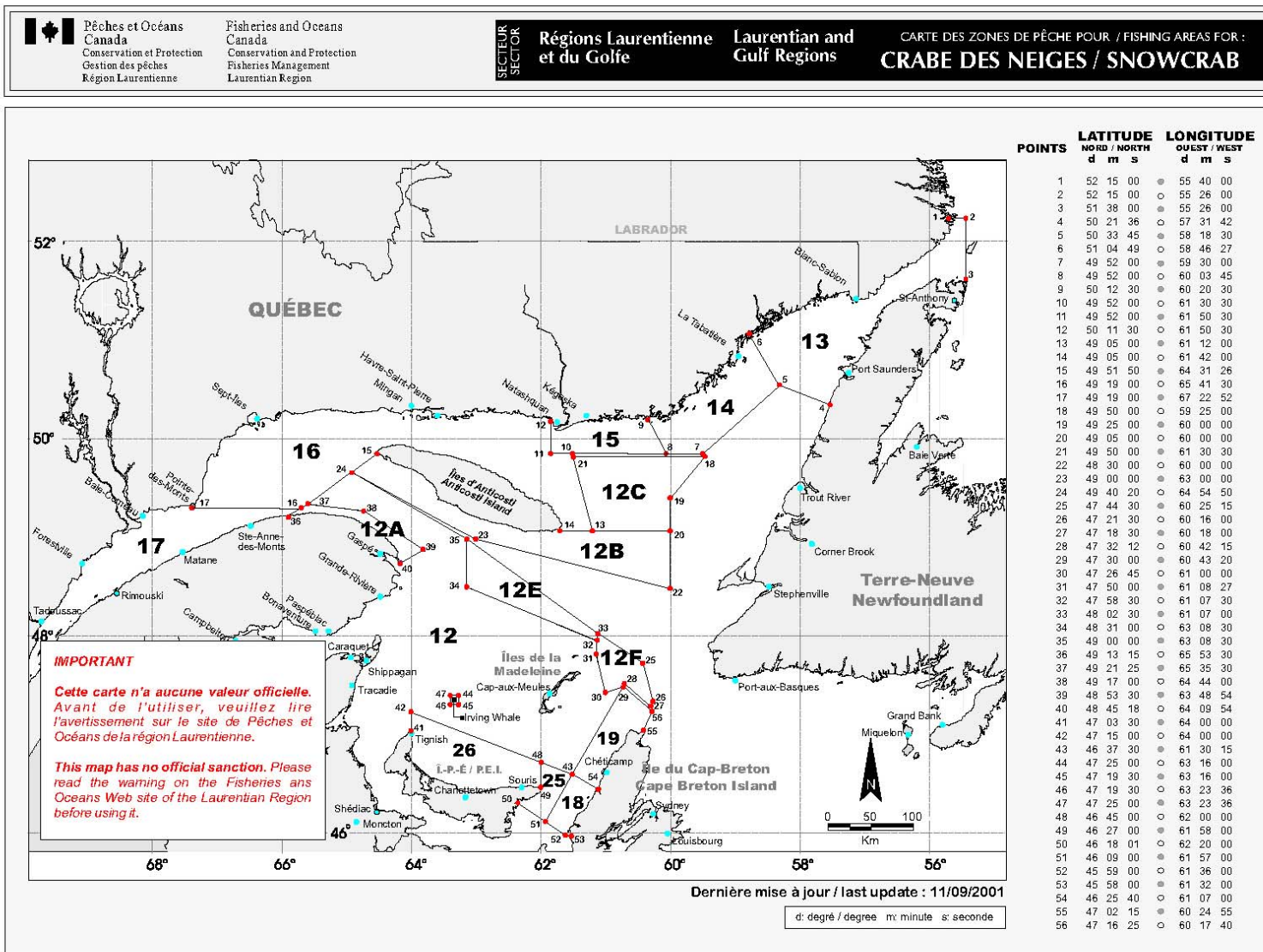
Diagram 1
Illustration of the Economic Break-Even Point in 2000
Area 15 Crabbers



In theory, the economic break-even point established at 6,677 kg (14,720 lb) of snow crab in 2000 meant that when a fishing business reached this landing volume, it met its overall fixed and variable costs but had a null cash flow. Any additional quantity of snow crab on top of that amount would allow the business to enjoy a positive cash flow.

ANNEXES

Annex 1 Chart of Snow Crab Fishing Areas



Annex 2

Key Information Gathered During the Survey

- Business general characteristics (main and secondary vessels)
 - CFVN
 - Length
 - Type of hull
 - Gross tonnage
 - Braking power
 - Year construction was complete
 - Year of purchase
- Capital
 - Spread of initial purchase price according to vessel components
 - Additions or major modifications made after purchase
 - Land assets
- Fishing effort
 - Number of days at sea and number of weeks per species
 - Number of trips
 - Crew size per species
- Variable costs
 - Salaries and social charges
 - Fuel, oil and grease
 - Food
 - Bait service, ice and salt
 - Vessel maintenance and repairs
 - Repairs, replacement and acquisition of fishing gear
 - Dockside monitoring
 - Sea observers
 - Vehicle expenses
 - Marketing board
 - Co-management
- Fixed costs
 - Registration, licence and plate number fees
 - Wharf charges
 - Vessel storage
 - Association
 - Insurance
 - Legal and professional fees
 - Leasing of quotas
 - Leasing of vessel
 - Interest expenses
 - Loan reimbursement
- Loans
 - Balance
- Various types of incomes
 - Gross fishing income
 - Income from the leasing of quotas
 - Others