
**ECONOMIC SURVEY RESULTS
OF CRABBERS' EXPLOITATION IN AREA 16
1998-2000**

QUEBEC REGION



Fisheries and Oceans Canada

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SUMMARY

The overall financial situation of Area 16 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 and by higher quotas for individual fishermen. As for cash flow, it increased significantly in 2000 amounting to more than \$345,000 in average for this fleet.

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 16 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 16 Crabbers" which focused on the year 1998. The results of this latter study are appended to this document for comparison purpose.

This type of survey carries special significance because 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 16 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

Thirty-eight Quebec crabbers operate in Area 16 and sixteen 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. Data collection was carried out between September and December 2001.

The survey was conducted using a questionnaire developed by the Department. This questionnaire asked all the information needed 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:

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

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.

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. In the case of Area 18 crabbers, labour costs are considered as fixed charges.

Results displayed on Table 1 reveal that the average cash flow amounted to \$124,057 in 1999 and \$345,830 in 2000. Gross income in the fisheries reached \$305,393 in 1999 and soared up in 2000 reaching \$574,073, mainly because of increasingly higher snow crab landing prices and increased quotas for each fisherman.

An examination of the structure of operating costs reveals that the highest costs are labour costs. These charges totaled \$83,563 in 1999 and \$105,638 in 2000. During the two years, they represented more than 46% of the overall operating costs. It should also be noted that, compared to 1999, these charges increased by nearly 26% in value in 2000 compared to 1999. Furthermore, there were financial expenses with 15% of the total charges in 1999 and 11% during the year 2000. Professional and legal fees were also substantial with respectively 10% of the overall operating expenses and 8% in 2000.

Table 1
Cash Flow and Structure of Operating Costs
Area 16 Crabbers

	1998		1999		2000	
	(\$)	Share in %	(\$)	Share in %	(\$)	Share in %
INCOME						
Gross income						
Gross fishing income	246,022	-	305,393	-	573,886	-
Other income	0	-	0	-	187	-
Overall income	246,022		305,393		574,073	
OPERATING COSTS						
Variable costs						
Fuel, oil and grease	6,841	4	6,058	3	8,042	4
Fishing gear	6,677	4	2,780	2	4,944	2
Maintenance	7,313	4	10,231	6	17,198	8
Others	20,198	12	15,035	8	18,413	8
Subtotal:	41,029	24	34,104	19	48,597	22
Fixed costs						
Labour	70,576	42	83,563	46	105,638	46
Financial expenses	34,795	21	27,844	15	25,356	11
Insurance	5,353	3	5,380	3	5,701	2
Administrative and legal fees	Included in others		18,496	10	18,774	8
Others (registration, licence, association, etc.)	14,498	9	11,949	7	24,177	11
Subtotal:	125,222	75	147,232	81	179,646	78
Overall operating costs:	166,252	100	181,336	100	228,243	100
CASH FLOW:	79,770		124,057		345,830	

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 16 Crabbers

	1998	1999	2000
Cash flow	79,770	124,057	345,830
Employment Insurance	2,990	851	738
<i>Total</i>	<i>82,760</i>	<i>124,908</i>	<i>346,568</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 16 reached \$124,908 in 1999 and \$346,568 in the year 2000. It should be noted that income originating from Employment Insurance has stabilized around \$800 during the two years. As a result, the increase of the average owners' income mainly arose from a \$221,773 increase in the cash flow.

2.2 Structure of the Landings

Table 3
Structure of the Average Landings
Area 16 Crabbers

	Average Landings (\$)	Average Landings (kg)	Average Landing Price (\$/kg)
1999			
Snow crab	304,505	72,782	4.18
Cod	1	2	-
Greenland halibut	618	327	1.89
Atlantic halibut	137	20	6.85
Others	132	167	-
Total	305,393	73,298	-
2000			
Snow crab	573,226	108,320	5.29
Cod	0	0	-
Greenland halibut	3	1	-
Atlantic halibut	613	89	6.89
Others	44	54	-
Total	573,886	108,464	-

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

Total landings (including all species) were estimated at an average value of \$305,393 in 1999 and \$573,886 in 2000. Such landings represented an overall volume of about 73.3 tonnes in 1999 and about 108.5 tonnes in 2000. These figures represented roughly a 48% volume increase.

Snow crab landings, which represented more than 99% of the total landings were worth \$304,505 in 1999 and \$573,226 in 2000. The landed volume of snow crab increased by 35,538 kg in 2000. The landing price increased by 58% in 2000 and reached 5.29 \$/kg.

Income generated by secondary species registered a \$228 decline in 2000. In value, these landings amounted to \$660 in 2000.

2.3 Technico-Economic Characteristics of Area 16 Crabbers

Table 4
Technico-Economic Characteristics of Area 16 Crabbers
(Average Values)

Description	1999	2000
Average fleet age	13	14
Vessel average length	45'00'	45'00'
Duration of fishing season (weeks)	13.9	14.7
Size of crew	3.1	3.4
Vessel initial purchase price	\$305,340	\$305,340
Purchase price of assets on land	\$20,444	\$25,569
Major additions or modifications	\$62,679	\$70,117
Depreciation	\$138,915	\$158,227
Value of assets on December 31 st	\$249,547	\$242,798
Balance of loans	\$55,202	\$69,730
<i>Debts/Assets ratio</i>	0.22	0.29

Sources: Fishermen Sample Survey

The fishing season for Area 16 crabbers lasted a period of 13.9 weeks in 1999 and lasted 14.7 weeks in 2000. The size of the fishing crew increased slightly in 2000 rising from 3.1 employees in 1999 to 3.4 employees, 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 14 years. The vessel purchase price remained stable during those two years and reached \$305,340, while the value of assets on land increased by 25%, and that of the major additions or modifications increased by 12%. Despite such investments, assets value dropped by almost 3% down to \$242,798 in 2000.

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 0.22 in 1999 and 0.29 in 2000, which meant that the debts incurred represented about 22% of the value of the business assets in 1999 and 29% in 2000.

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 16 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 enjoy 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 (\$)

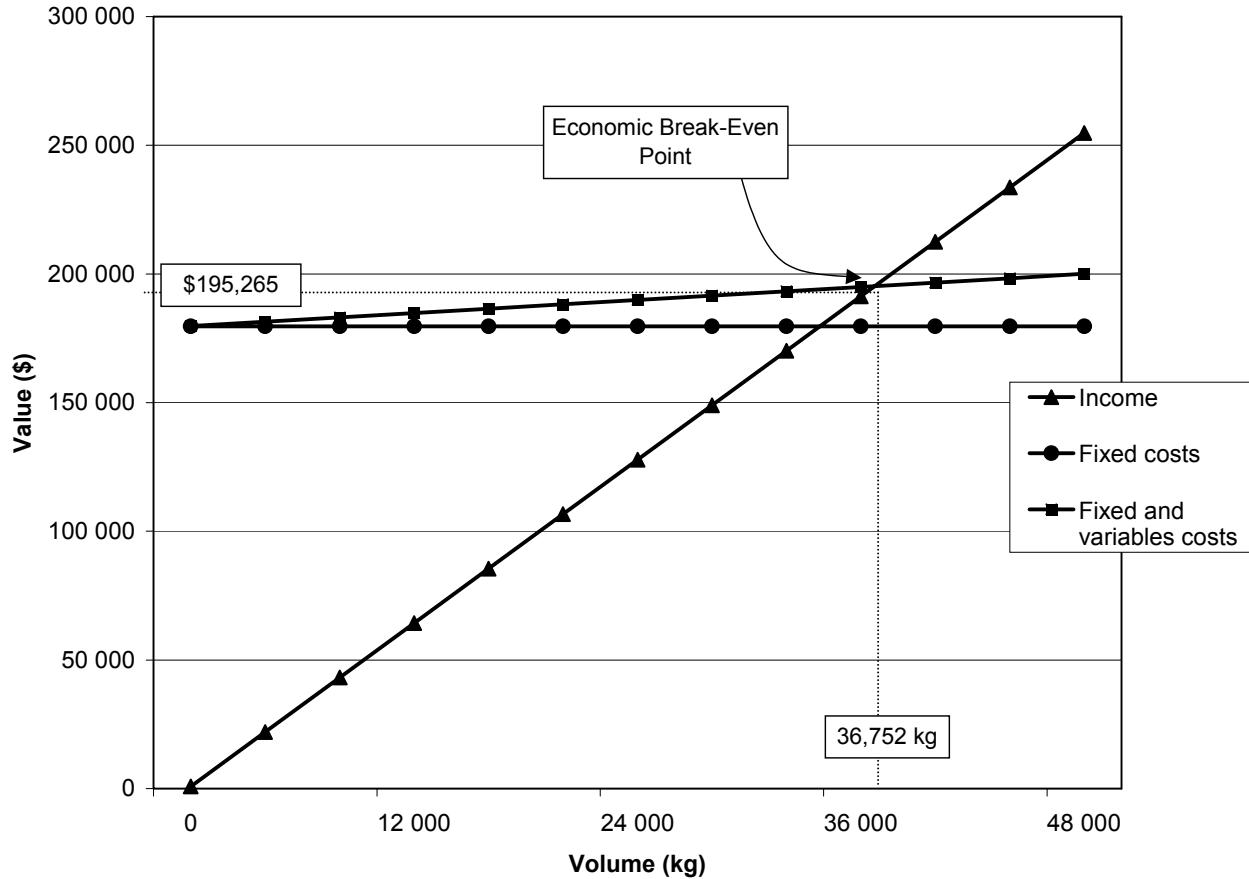
Table 5
Quantities of Crab Needed to Reach the Economic Break-Even Point
Area 16 Crabbers

	<i>Unit</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>
FIXED COSTS (FC)	\$	125,222	147,232	179,646
Variable costs (VC)	\$	41,029	34,104	48,597
Overall landings (all species)	\$	246,022	305,393	574,073
Variable costs / Overall landings	\$	0.17	0.11	0.08
MARGIN BEFORE FIXED CHARGES (MBFC)	\$	0.83	0.89	0.92
ECONOMIC BREAK-EVEN POINT (Overall landings)	\$	150,286	165,429	195,267
<i>LANDINGS OF CRAB NEEDED TO REACH THE ECONOMIC BREAK-EVEN POINT</i>	<i>Kg</i>	<i>38,434</i>	<i>39,364</i>	<i>36,752</i>
	<i>(lb)</i>	<i>(84,732)</i>	<i>(86,783)</i>	<i>(81,024)</i>
ACTUAL CRAB LANDINGS MINUS THE ECONOMIC BREAK-EVEN POINT	Kg	30,124	33,418	71,568
	(lb)	(66,412)	(73,674)	(157,780)

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 8% of the overall landed value (variables costs/total landings). Therefore, \$0.92 per landed dollar was left to cover fixed costs (margin before fixed charges). In order to reach the economic break-even point, Area 16 crabbers had to land 36,752 kg (81,024 lb) in 2000, which was lower than their actual landings. In fact, crabbers landed sufficiently large amounts of snow crab to reach the economic break-even point thereby ensuring the payment of a salary and a profit to the captain-owner.

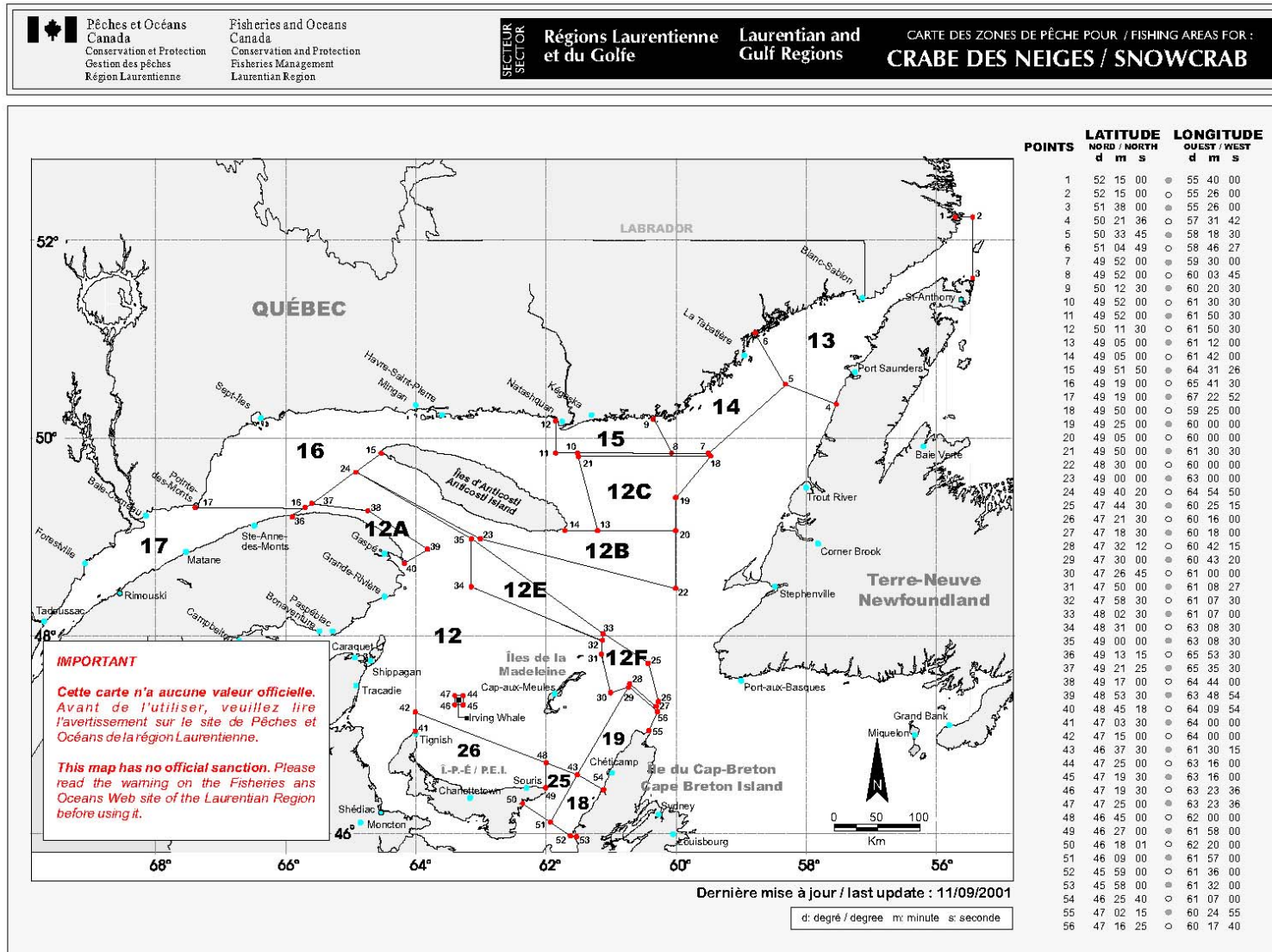
Diagram 1
Illustration of the Economic Break-Even Point in 2000
Area 16 Crabbers



In theory, the economic break-even point established at 36,752 kg (81,024 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