
**ECONOMIC SURVEY RESULTS
OF CRABBERS' EXPLOITATION IN AREA 14
1998-2000**

QUEBEC REGION



Fisheries and Oceans Canada

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SUMMARY

The overall financial situation of Area 14 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. Labour-related expenditures also increased as well as maintenance costs. Finally, cash flow income more than doubled in 2000 settling slightly above the \$36,000 mark 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 14 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 Operating Results of Area 14 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 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 14 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

Twenty-one Quebec crabbers operate in Area 14 and nine 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 prepared by the Department. This questionnaire asked all the information that was required to carry out the survey. It is important to underscore the confidential nature of such information and also that results discussed in this report only 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 overall 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 the 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) although it 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 be sometimes 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 that 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 14 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 \$16,169 in 1999 and \$36,433 in 2000. Gross income in the fisheries reached \$97,974 in 1999 and soared in 2000 reaching \$141,011, 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 \$47,706 in 1999 and \$70,081 in 2000. Which means that during the two years, labour costs represented more than 58% of the overall operating costs. It should also be noted that, compared to 1999, the value of the charges increased by nearly 47% in 2000. Such an increase arose from the fact that the labour charged varied with the business gross income. There were also maintenance and repair costs. The latter totaled 7% of the overall operating costs in 1999 and 11% in 2000.

Table 1
Cash Flow and Structure of Operating Costs
Area 14 Crabbers

	1998		1999		2000	
	(\$)	Share in %	(\$)	Share in %	(\$)	Share in %
INCOME						
Gross income						
Gross fishing income	96,184	-	97,974	-	150,716	-
Other income	327	-	0	-	295	-
Overall income	96,511		97,974		151,011	
OPERATING COSTS						
Variable costs						
Labour	46,009	49	47,706	58	70,081	61
Fuel, oil and grease	6,173	6	3,631	5	5,818	5
Fishing gear	2,826	3	4,794	6	4,900	4
Maintenance	5,270	6	5,591	7	12,322	11
Others (vehicle-related expenses, dockside monitoring, etc.)	9,491	10	7,688	9	5,552	5
Subtotal:	69,769	74	69,410	85	98,673	86
Fixed costs						
Financial expenses	15,712	17	5,881	7	8,294	7
Insurance	3,272	3	1,834	2	1,734	2
Others (registration, licence, association, etc.)	4,996	5	4,680	6	5,877	5
Subtotal:	23,981	26	12,395	15	15,905	14
Overall operating costs:	93,749	100	81,805	100	114,578	100
CASH FLOW:	2,762		16,169		36,433	

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 14 Crabbers

	1998	1999	2000
Cash flow	2,762	16,169	36,433
Employment Insurance	10,651	10,248	9,838
TAGS Program	1,160	0	0
<i>Total</i>	<i>14,573</i>	<i>26,417</i>	<i>46,271</i>

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

As can be seen on the table above, the owners' income generated by snow crab fishing businesses in Area 14 reached \$26,417 in 1999 and \$46,271 in 2000. It should be noted that the income originating from Employment Insurance has stabilized at around \$10,000 in the past two years. Consequently, the increase of the average owners' income mainly arose from a \$20,264 increase in the cash flow.

2.2 Structure of Landings

Table 3
Structure of Average Landing
Area 14 Crabbers

	Average Landings (\$)	Average Landings (kg)	Average Landing Price (\$/kg)
1999			
Snow crab	85,967	24,986	3.44
Cod	2,926	2,892	1.01
Greenland halibut	6,866	3,469	1.98
Atlantic halibut	1,437	250	5.75
Others	778	673	-
Total	97,974	32,270	-
2000			
Snow crab	139,533	27,240	5.12
Cod	1,917	1,608	1.19
Greenland halibut	1,038	500	2.08
Atlantic halibut	6,402	1,054	6.07
Others	1,827	1,522	-
Total	150,716	31,923	-

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

Total landings (including all species) reached an overall average value of \$97,974 in 1999 and \$150,716 in 2000. Such landings represented an overall volume of 32.3 tons in 1999 and 31.9 tons in 2000. These figures represented about a 1% volume decrease.

Snow crab landings, which represented more than 88% of the total landings in 1999 and 93% in 2000, amounted to \$85,967 in 1999 and to \$139,533 in 2000. Landed volumes of snow crab increased by 9% rising from 24,986 kg in 1999 to 27,240 kg in 2000. Together with this growing volume, snow crab landed price likewise increased by roughly 49% in 2000 and reached 5.12 \$/kg.

As far as secondary species are concerned, it should be noted that income generated by cod and Greenland halibut decreased by 16% in 2000. In volume, this represented a decline of about 52%. Atlantic halibut made up for the decline of these two species with landings growing by about \$5,000.

2.3 Technico-Economic Characteristics of Area 14 Crabbers

Table 4
Technico-Economic Characteristics of Area 14 Crabbers
(Average Values)

Description	1999	2000
Average fleet age	15	16
Vessel average length	41'01''	41'01''
Duration of fishing season (weeks)	9.6	8.1
Size of crew	3.3	3.4
Vessel initial purchase price	\$65,166	\$73,311
Purchase price of assets on land	\$0	\$1,433
Major additions or modifications	\$25,078	\$45,076
Depreciation	\$47,505	\$57,298
Value of assets on December 31 st	\$42,738	\$62,522
Balance of loans	\$29,188	\$38,344
Debts/Assets ratio	0.68	0.61

Sources: Fishermen Sample Survey

The fishing season for Area 14 crabbers lasted over a period of 9.6 weeks in 1999 and lasted 8.1 weeks in 2000. The size of the fishing crew increased slightly in 2000 rising from 3.3 crew in 1999 to 3.4 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 15 years. One should also point out that the vessel initial purchase price increased in 2000 and that major considerable additions or modifications were made during the year 2000. These developments generated a 46% increase in the assets value with the result that they surged up to \$62,522 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 0.68 in 1999 and 0.61 in 2000, which meant that the debts incurred represented about 68% of the value of the assets in 1999 and 61% 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 14 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: $FC = \text{fixed costs or charges } (\$)$

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

$VC = \text{variable costs or charges } (\$)$

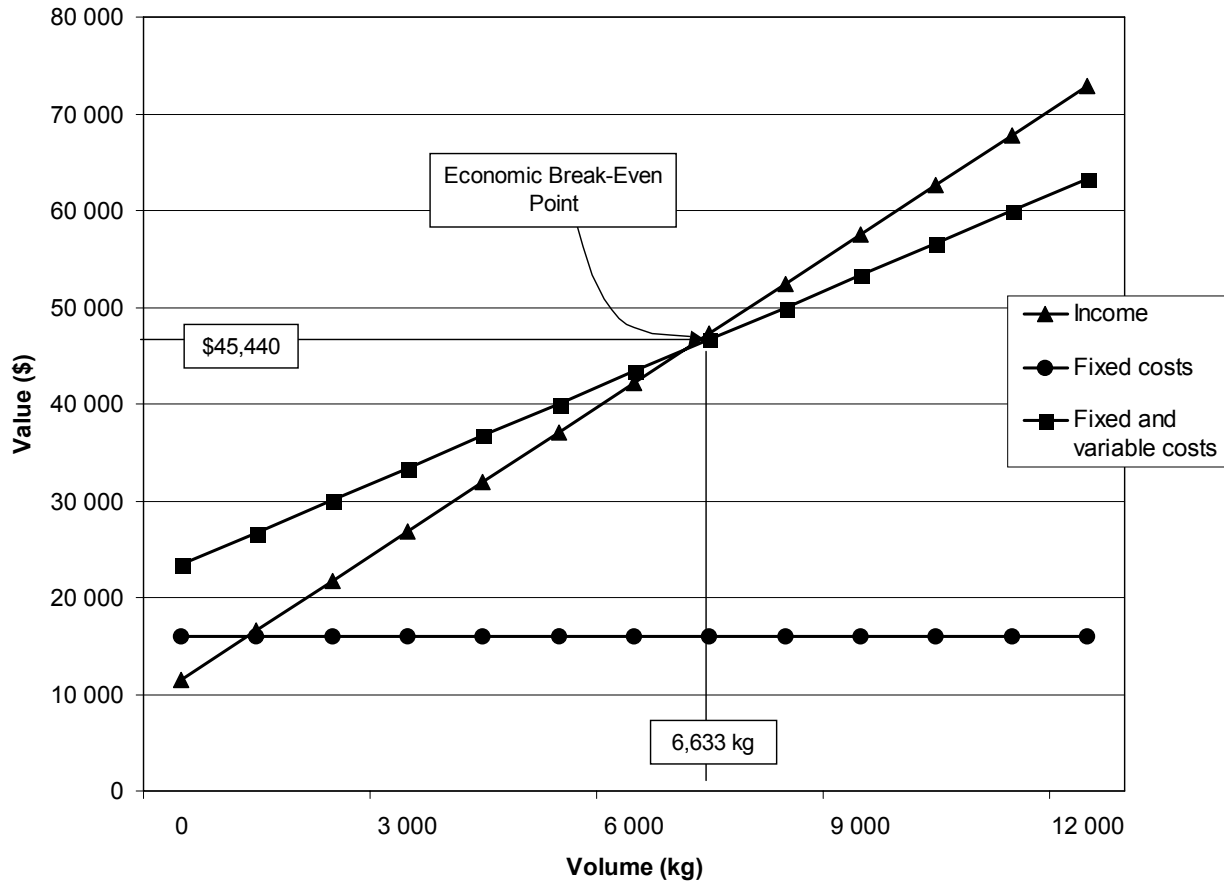
Table 5
Quantities of Crab Needed to Reach the Threshold of Profitability
Area 14 Crabbers

	<i>Unit</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>
FIXED COSTS (FC)	\$	23,981	12,395	15,905
Variable costs (VC)	\$	69,769	69,410	98,673
Overall landings (all species)	\$	96,184	97,974	151,011
Variable costs / Overall landings	\$	0.73	0.71	0.65
MARGIN BEFORE FIXED CHARGES (MBFC)	\$	0.27	0.29	0.35
ECONOMIC BREAK-EVEN POINT (Overall landings)	\$	87,318	42,741	45,442
<i>LANDINGS OF CRAB NEEDED TO REACH THE ECONOMIC BREAK-EVEN POINT</i>	<i>Kg</i>	<i>25,162</i>	<i>8,934</i>	<i>6,633</i>
	<i>(lb)</i>	<i>(55,473)</i>	<i>(19,696)</i>	<i>(14,623)</i>
ACTUAL CRAB LANDINGS MINUS THE ECONOMIC BREAK-EVEN POINT	Kg	3,269	16,052	20,607
	(lb)	(7,207)	(35,389)	(45,431)

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 65% of the overall landed value (variables costs/total landings). Therefore \$0.35 per landed dollar was left to cover fixed costs (margin before fixed charges). In order to reach the economic break-even point, crabbers had to land 6,633 kg (14,623 lb) of snow crab in 2000, a figure lower than their actual landings. 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.

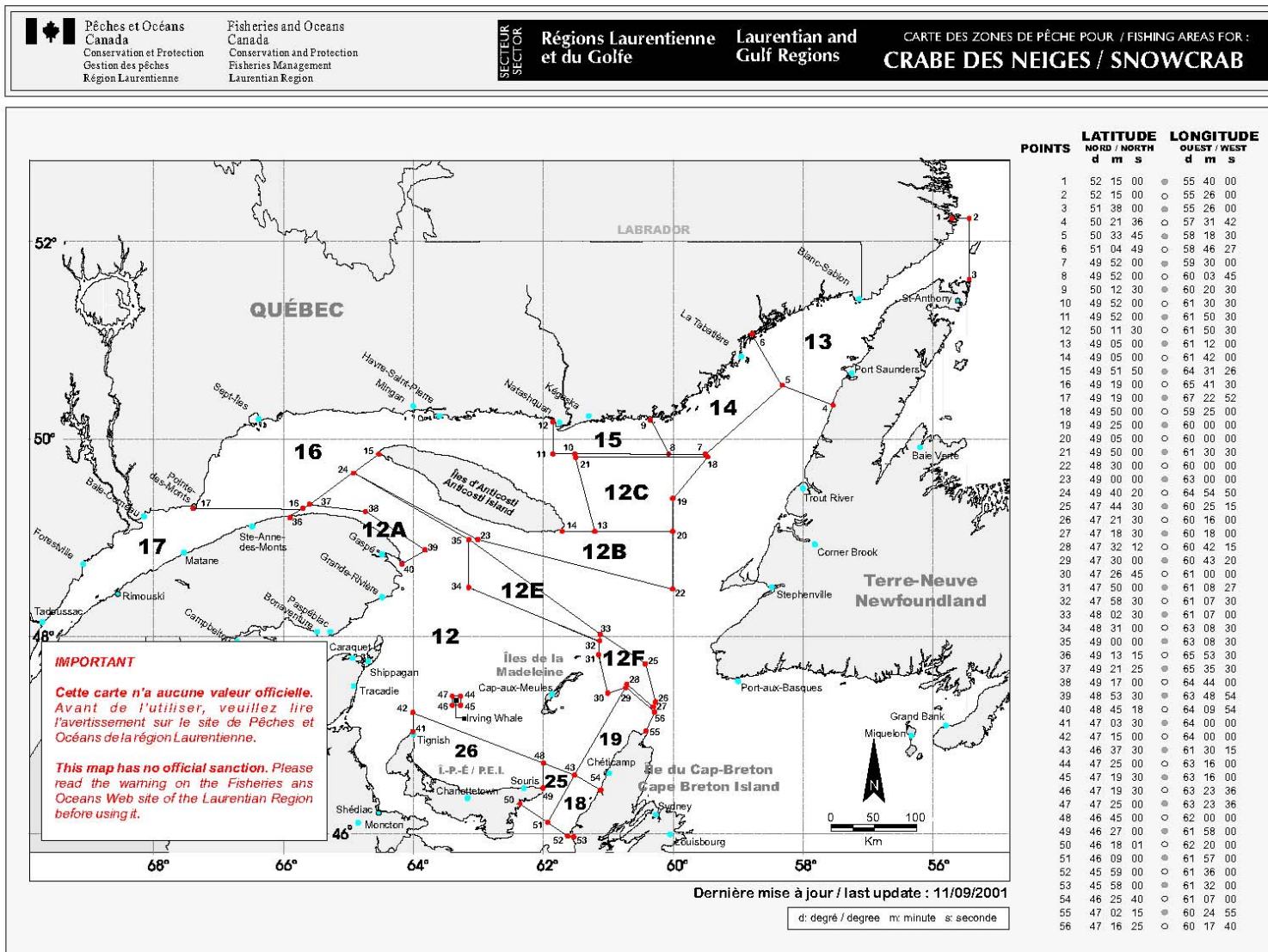
Diagram 1
Illustration of the Economic Break-Even Point in 2000
Area 14 Crabbers



In theory, the economic break-even point established at 6,613 kg (14,623 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