
**ECONOMIC SURVEY RESULTS
OF CRABBERS' EXPLOITATION IN AREA 12C
1998-2000**

QUEBEC REGION



Fisheries and Oceans Canada

March 2002

PUBLISHED BY:

**Policy and Economics Branch
Fisheries and Oceans
Quebec QC
G1K 7Y7**

© Her Majesty the Queen in Right of Canada, 2002

**Catalogue number Fs 66-5/158E
ISSN 0843-5626**

Economic Analysis Report n° 158

Cette publication est aussi disponible en français

SUMMARY

The overall financial situation of Area 12C crabbers' fleet improved markedly in 2000. The noticeable increase of gross income in the fishing businesses could be mainly explained by the rising snow crab prices in 2000. Regarding expenditures, labour costs increased slightly. As to cash flow income, it rose sharply in 2000 reaching more than \$55,000 in average for this fleet. Furthermore, it should be taken into consideration that this is an aging fleet of vessels (17 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.

TABLE OF CONTENTS

1. Methodology	3
1.1 DATA COLLECTION	3
1.2 DATA VALIDATION.....	3
2. Results and Analysis	5
2.1 CASH FLOW	5
2.2 STRUCTURE OF THE LANDINGS.....	9
2.3 TECHNICO-ECONOMIC CHARACTERISTICS OF AREA 12C CRABBERS	10
2.4 ECONOMIC BREAK-EVEN POINT	11

LIST OF TABLES AND DIAGRAMS

Table 1: Cash flow and Structure of Operating Costs	7
Table 2: Owners' Overall Average Income.....	8
Table 3: Structure of Average Landing	9
Table 4: Technico-Economic Characteristics of Area 12C Crabbers.....	10
Table 5: Quantities of Crab Needed to Reach the Economic Break-even Point	12
Diagram 1: Illustration of the economic break-even point in 2000.....	13

LIST OF ANNEXES

Annex 1: Chart of Snow Crab Fishing Areas.....	17
Annex 2: Key Information Gathered During the Survey	19

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 12C 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. In order to preserve the confidential character of the data collected from the fishermen, the results of the year 1998 can't be presented.

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 12C 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

Five Quebec crabbers operate in Area 12C and four 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 three researchers who were spread accordingly over the geographical regions of the sample. Data collection took place from September to December 2001.

The survey was carried out using a questionnaire developed by the Department. This questionnaire contained all the information associated with the survey requirements. 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 the 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 computation of a financial result which takes into account the incomes earned and disbursements made by the fishing businesses during the year. This financial result does not take asset depreciation into account (which 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 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 financial expenses for which effective payment is considered). The cash flow can therefore be computed as follows :

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

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 directly associated with 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 12C 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 on Table 1 reveal that the average cash flow amounted to \$33,994 in 1999 and \$55,892 in 2000. Gross income in the fisheries reached \$163,740 in 1999 and rose in 2000 reaching \$223,336, mainly because of increasingly higher landing prices.

An examination of the structure of operating costs reveals that the highest costs were labour costs. They totaled \$59,009 in 1999 and \$81,652 in 2000. These figures over the two years represented more than 45% of the total operating costs. Besides, it is to be noted that the value of these charges soared by nearly 38% in 2000 compared to 1999. That increase arose from the fact that large portions of labour-related charges varied with the fishing business gross income. Additionally, some labour costs were included in the vessel leasing costs. Given the fact that half the fishermen interviewed resorted to vessel leasing, labour-related charges may have been higher than the actual figures displayed hereon.

Table 1

Cash flow and Structure of Operating Costs

Area 12C Crabbers

	1999		2000	
	(\$)	Share in %	(\$)	Share in %
INCOME				
Gross income				
Gross fishing income	163,740	-	223,336	-
Other income	0	-	0	-
Overall income	163,740		223,336	
OPERATING COSTS				
Variable costs				
Labour	59,009	45	81,652	49
Fishing gear	2,752	2	2,822	1
Others (Fuel, oil and grease, maintenance costs, vehicle-related expenses, dockside monitoring, etc.)	16,267	13	18,143	11
Subtotal:	78,028	60	102,617	61
Fixed costs				
Financial expenses	10,298	8	10,348	6
Insurance	1,550	1	1,550	1
Others (registration, vessel leasing, licence, association, etc.)	39,870	31	52,929	32
Subtotal:	51,718	40	64,827	39
Overall operating costs	129,746	100	167,444	100
CASH FLOW	33,994		55,892	

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

Please note that to protect the privacy of the fishermen interviewed, some sub-aggregates could not be displayed on Table 1.

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 12C Crabbers

	1999	2000
Cash flow	33,994	55,892
Employment Insurance	9,864	9,633
<i>Total</i>	<i>43,858</i>	<i>65,525</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 12C increased by nearly 50% in 2000, soaring from \$43,858 in 1999 to \$65,525 in 2000. It should be noted that the income originating from Employment Insurance has stabilized at around \$9,700 in the past two years. Consequently, the increase in the average owners' income was mostly due to the \$21,898 increase in the cash flow.

2.2 Structure of the Landings

Table 3
Structure of Average Landing
Area 12C Crabbers

	Average Landings (\$)	Average Landings (kg)	Average Landing Price (\$/kg)
1999			
Snow crab	159,949	40,558	3.94
Cod	3,792	3,023	1.25
Others	0	0	-
Total	163,740	43,581	-
2000			
Snow crab	219,968	41,573	5.29
Cod	1,858	1,830	1.02
Others	1,511	685	-
Total	223,336	44,088	-

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

Total landings (including all species) have an overall average value amounting to \$163,740 in 1999 and to \$223,336 in 2000. Such landings represented a total volume of 43.6 tonnes in 1999 and 44.1 tonnes in 2000.

Snow crab landings, which represented more than 98% of the fishers' total landings, were worth \$159,949 in 1999 and \$223,336 in 2000. Snow crab landed volumes increased, in average, by one ton in 2000 compared to 1999. In fact, this volume went up from 40,558 kg in 1999 to 41,573 kg in 2000. With the growing volume, the price of landed snow crab increased likewise by nearly 34% in 2000 and reached 5.29 \$/kg.

As far as secondary species are concerned, one should point out that income generated by cod decreased by 51% in 2000. In volume, this represented a drop of about 39%.

2.3 Technico-Economic Characteristics of Area 12C Crabbers

Table 4
Technico-Economic Characteristics of Area 12C Crabbers
(Average Values)

Description	1999	2000
Average fleet age	16	17
Vessel average length	49'06''	49'06''
Duration of fishing season (weeks)	5.8	5
Size of crew	3.8	3.8
Vessel initial purchase price	\$75,000	\$75,000
Purchase price of assets on land	\$13,250	\$20,000
Major additions or modifications	\$10,150	\$12,400
Depreciation	\$35,050	\$43,167
Value of assets on December 31 st	\$63,350	\$64,233
Balance of loans	\$67,791	\$61,427
Debts/Assets ratio	1.07	0.96

Sources: Fishermen Sample Survey

The fishing season for Area 12C crabbers spread over a period of 5.8 weeks in 1999 and lasted 5 weeks in 2000. The size of the fishing crew stabilized at around 3.8 crew in 1999 and 2000, 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. Furthermore, it has to be pointed out that, despite the age of the vessels, few major additions or modifications were made. Such expenses only totaled \$12,400 in 2000. This situation can be explained by the fact that some fishermen resorted to vessel leasing. If assets depreciation is taken into account, assets value amounted to \$64,233 at the end of 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 1 for the two years under study, which meant that the debts incurred represented about 100% of the value of the business 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 12C crabbers. The economic break-even point¹ is also called the "threshold 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 12C Crabbers

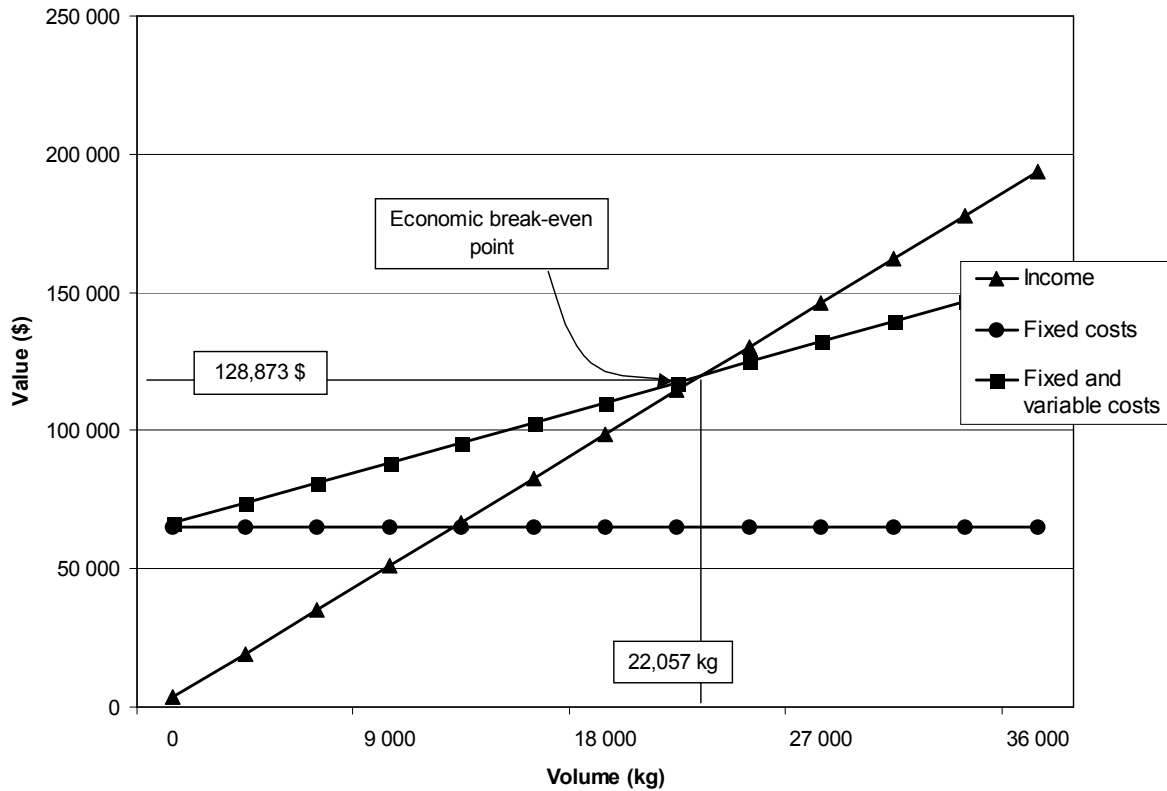
	<i>Unit</i>	<i>1999</i>	<i>2000</i>
FIXED COSTS (FC)	\$	51,718	64,827
Variable costs (VC)	\$	78,028	102,617
Overall landings (all species)	\$	163,740	223,336
Variable costs / Total of landings	\$	0.48	0.46
MARGIN BEFORE FIXED CHARGES (MBFC)	\$	0.52	0.54
ECONOMIC BREAK-EVEN POINT (Overall landings)	\$	99,458	120,050
LANDINGS OF CRAB NEEDED TO REACH THE ECONOMIC BREAK-EVEN POINT	<i>Kg</i>	<i>24,281</i>	<i>22,057</i>
	<i>(lb)</i>	<i>(53,530)</i>	<i>(48,627)</i>
ACTUAL CRAB LANDINGS MINUS THE ECONOMIC BREAK-EVEN POINT	<i>Kg</i>	<i>16,277</i>	<i>19,516</i>
	<i>(lb)</i>	<i>(35,885)</i>	<i>(43,025)</i>

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

In 2000, variable costs represented 46% of the overall landed value (variables costs/total landings). Therefore \$0.54 per landed dollar was left to cover fixed costs (margin before fixed charges). In order to reach the economic break-even point, Area 12C crabbers had to land 22,057 kg (48,627 lb) of snow crab in 2000, a figure lower than what they actually landed. In fact, crabbers landed sufficiently large quantities of snow crab to reach the

economic break-even point thereby ensuring the payment of a salary and a profit to the captain-owner.

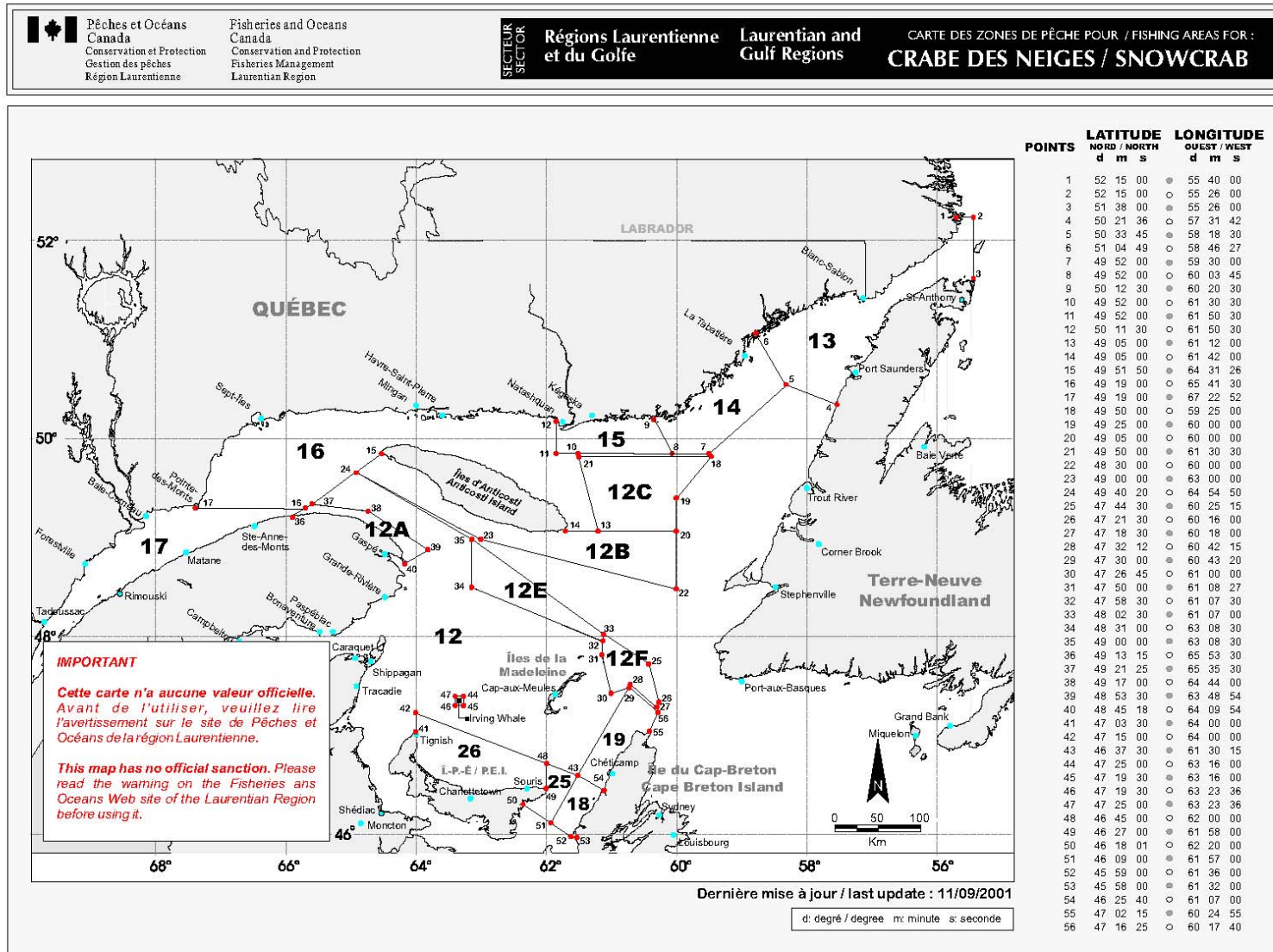
Diagram 1
Illustration of the economic break-even point in 2000
Area 12C Crabbers



In theory, the economic break-even point established at 22,057 kg (48,627 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 would then 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 completed
 - 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