ECONOMIC SURVEY RESULTS OF CRABBERS' EXPLOITATION IN AREA 13 1998-2000

QUEBEC REGION

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SUMMARY

The overall financial situation of Area 13 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. Likewise, labour costs increased as did loan reimbursement. As to cash flow income, it more than doubled in 2000 reaching $13,000 in average for this fleet. Furthermore, one should take 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.

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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 13 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 13 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 product of a survey carried out with Area 13 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

Forty-three Quebec crabbers operate in Area 13 and a sample of 18 fishermen was extracted therefrom 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-investigators 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 (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 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 for that year must have been met (with the exception of financial expenses for which effective payment is considered). The cash flow can therefore be computed as follows :

OVERALL INCOME *minus* - variable operating costs *(details in Annex 1)*
- fixed operating costs *(details in Annex 1)*

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 13 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 $5,194 in 1999 and $13,276 in 2000. Gross income in the fisheries reached $70,968 in 1999 and soared in 2000 reaching $104,114, mainly because of increasingly higher snow crab landing prices.

A look at the structure of operating costs reveals that the highest costs were labour costs. They totaled $34,910 in 1999 and $49,152 in 2000. Which means that during the two years, labour costs represented more than 53% of the overall operating costs. Besides, it should be noted that, compared to 1999, the value of these charges increased by nearly 41% in 2000. Moreover, there were financial expenses. The latter represented 7% of the overall operating costs in 1999 and 13% in 2000. Increasing expenses arose mainly from growing investments for fishing vessels.

Table 1

Cash Flow and Structure of Operating Costs

Area 13 Crabbers

	1998		1999		2000	
	($)	Share in %	($)	Share in %	($)	Share in %
INCOME						
Gross income						
Gross fishing income	39,814	-	70,385	-	102,178	-
Other income	1,614	-	583	-	1,936	-
Overall income	***41,428***		***70,968***		***104,114***	
OPERATING COSTS						
Variable costs						
Labour	21,085	49	34,910	53	49,152	54
Fuel, oil and grease	3,007	7	3,121	5	4,738	5
Fishing gear	2,640	6	2,736	4	4,156	5
Maintenance	2,304	5	4,194	6	4,693	5
Others (vehicle-related expenses, dockside monitoring, etc.)	6,170	14	9,807	15	8,119	9
Subtotal:	***35,206***	***81***	***54,768***	***83***	***70,858***	***78***
Fixed costs						
Financial expenses	2,991	7	4,675	7	11,970	13
Insurance	461	1	831	1	1,230	1
Others (registration, licence, association, etc.)	4,126	10	5,500	9	6,780	8
Subtotal:	***7,577***	***18***	***11,006***	***17***	***19,980***	***22***
Overall operating costs	***42,782***	***100***	***65,774***	***100***	***90,838***	***100***
CASH FLOW	***- 1,353***		***5,194***		***13,276***	

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 13 Crabbers

	1998	1999	2000
Cash flow	- 1,353	5,194	13,276
Employment Isurance	9,468	10,252	10,093
TAGS Program	3,033	0	0
Total	***11,148***	***15,447***	***23,369***

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 13 reached $15,447 in 1999 and $23,369 in 2000. It should be noted that the income originating from Employment Insurance has stabilized at around $10,000 in the past two years. Therefore, the increase of the average owners' income arose mainly from a $8,082 increase in the cash flow.

2.2 Structure of Landings

Table 3

Structure of Average Landing

Area 13 Crabbers

	Average Landings ($)	Average Landings (kg)	Average Landing Price ($/kg)
1999			
Snow crab	60,747	17,061	3.56
Cod	5,172	3,926	1.32
Greenland halibut	3,289	1,706	1.93
Atlantic halibut	204	31	6.58
Others	973	474	-
Total	***70,385***	***23,198***	**-**
2000			
Snow crab	93,545	16,601	5.63
Cod	3,413	3,192	1.07
Greenland halibut	4,139	1,969	2.10
Atlantic halibut	422	71	5.94
Others	659	555	-
Total	***102,178***	***22,388***	**-**

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

Total landings (including all species reached an overall average value of $70,385 in 1999 and $102,178 in 2000. Such landings represented an overall volume of 23.2 tons in 1999 and 22.4 tons in 2000. These figures represented roughly a 3.4% volume decrease.

Snow crab landings, which represented more than 86% of the total landings in 1999 and 92% in 2000, amounted to $60,747 in 1999 and to $93,545 in 2000. The landed volume of snow crab decreased by 460 kg in 2000 compared to 1999. Conversely, in 2000, the 5.63 $/kg selling price did more than make up for the declining volume. The rising prices represented a 58% increase compared to the previous year.

As far as secondary species are concerned, one should point out that income generated by cod dropped by 34% in 2000. In volume, this represented a decline of about 19%.

2.3 Technico-Economic Characteristics of Area 13 Crabbers

Table 4

Technico-Economic Characteristics of Area 13 Crabbers

(Average Values)

Description	1999	2000
Fleet average age	17	17
Vessel average length	40'02''	40'04''
Duration of fishing season (weeks)	9.1	8.1
Size of crew	3.1	3.2
Vessel initial purchase price	$93,047	$93,769
Purchase price of assets on land	$13,978	$17,183
Major additions or modifications	$13,929	$19,718
Depreciation	$55,543	$53,968
Value of assets on December 31st	$65,411	$76,703
Balance of loans	$11,936$	$33,236
Debts/Assets ratio	*0.18*	*0.43*

Sources: Fishermen Sample Survey

The fishing season for Area 13 crabbers lasted over a period of 9.1 weeks in 1999 while it decreased in 2000 and lasted only 8.1 weeks. The size of the fishing crew increased slightly in 2000 rising from 3.1 crew in 1999 to 3.2 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 17 years. The vessel purchase price had remained rather stable at

around $93,769 despite the purchase of new vessels by some fishermen included in the survey. Besides, major additions or modifications were made and the value of assets on land increased significantly. As a result, the assets value of fishing businesses in 2000 increased by nearly $76,703.

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 0.18 in 1999 and 0.43 in 2000, which meant that the debts incurred represented about 18% of the value of the assets in 1999 and 43% in 2000, a development which may be partially attributed to more investments made during the year 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 13 crabbers. The economic break-even point[1] 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:

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

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

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

VC = *variable costs or charges ($)*

Table 5
Quantities of Crab Needed to Reach the Economic Break-even Point
Area 13 Crabbers

	Unit	*1998*	*1999*	*2000*
FIXED COSTS (FC)	$	**7,577**	**11,006**	**19,980**
Variable costs (VC)	$	35,205	54,768	70,858
Overall landings (all species)	$	39,814	70,968	104,114
Variable costs / Overall landings	$	0.88	0.77	0.68
MARGIN BEFORE FIXED CHARGES (MBFC)	$	**0.12**	**0.23**	**0.32**
ECONOMIC BREAK-EVEN POINT (Overall landings)	$	**65,445**	**47,852**	**62,438**
LANDINGS OF CRAB NEEDED TO REACH THE ECONOMIC BREAK-EVEN POINT	*Kg* *(lb)*	***26,710*** ***(58,885)***	***10,571*** ***(23,305)***	***9,213*** ***(20,311)***
ACTUAL CRAB LANDINGS MINUS THE ECONOMIC BREAK-EVEN POINT	Kg (lb)	-10,974 (-24,193)	6,490 (14,308)	7,388 (16,288)

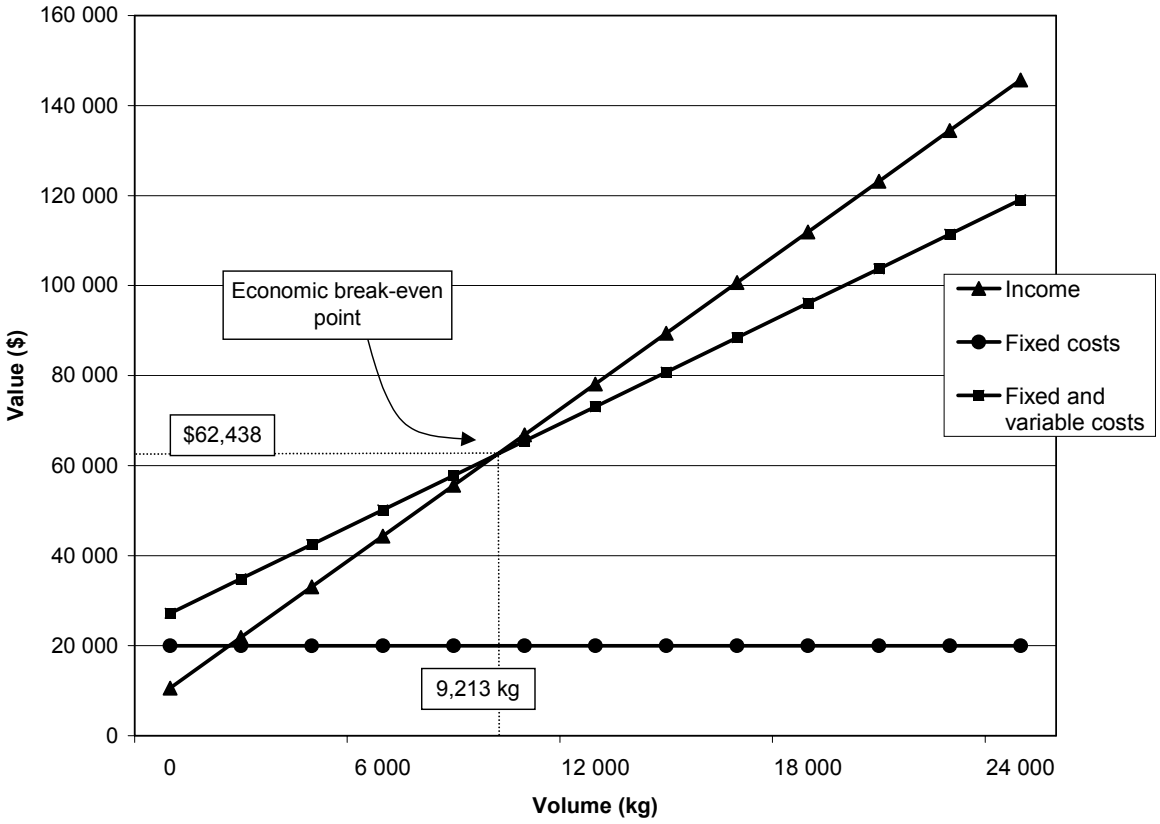
Note: *The calculation of the economic break-even point holds as hypothesis that landings should be constant for all the other species fished.*

Variable costs represented 68% of the overall landed value (variables costs/total landings). Therefore $0.32 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 9,213 kg (20,311 lb) of snow crab 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 allowing the payment of a salary and a profit to the captain-owner.

Diagram 1

Illustration of the Economic Break-even Point in 2000

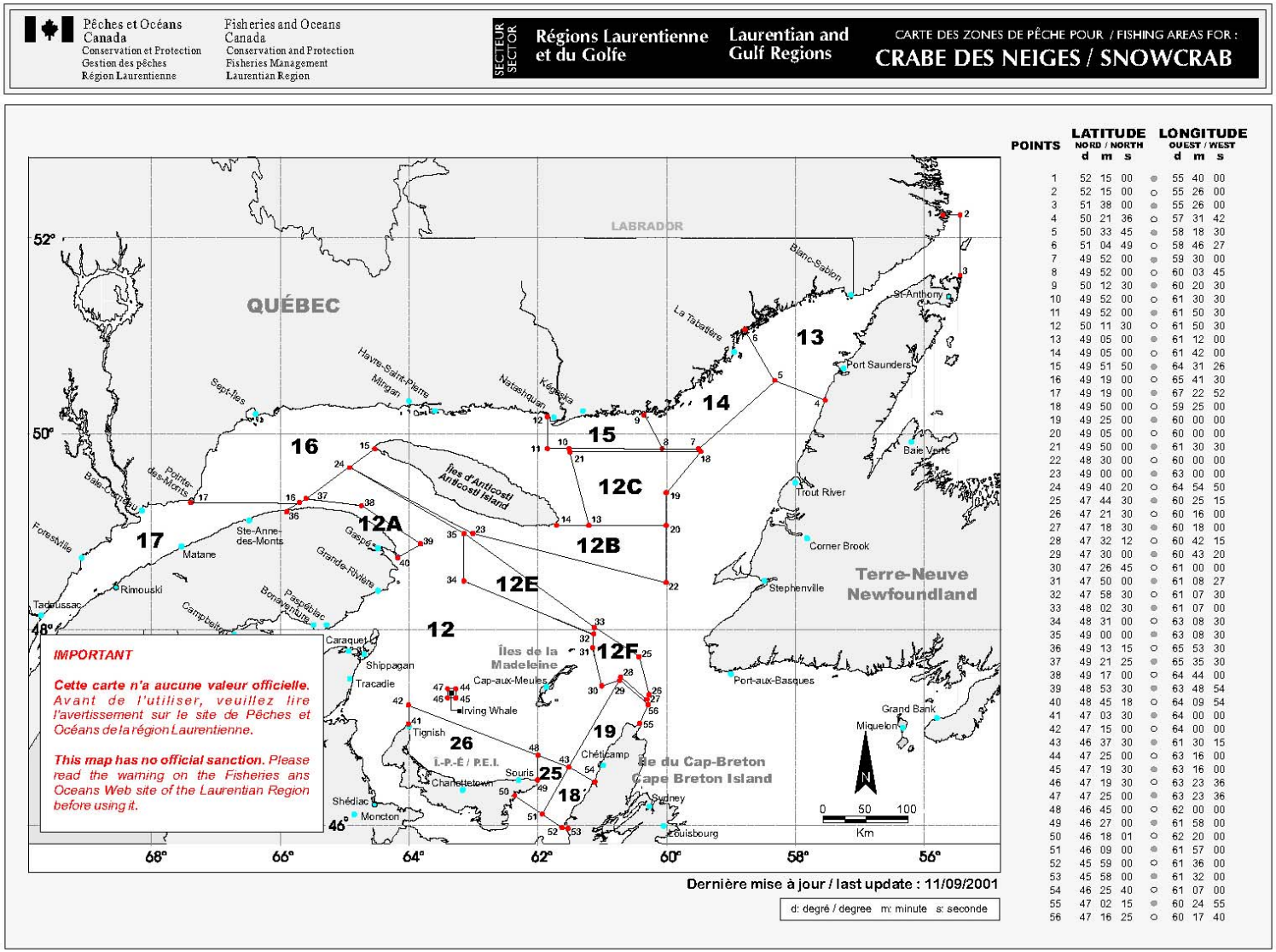
Area 13 Crabbers



In theory, the economic break-even point established at 9,213 kg (20,311 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



POINTS	LATITUDE NORD / NORTH d	m	s	LONGITUDE OUEST / WEST d	m	s
1	52	15	00	55	40	00
2	52	15	00	55	26	00
3	51	38	00	55	26	00
4	50	21	36	57	31	42
5	50	33	45	58	18	30
6	51	04	49	58	46	27
7	49	52	00	59	30	00
8	49	52	00	60	03	45
9	50	12	30	60	20	30
10	49	52	00	61	30	30
11	49	52	00	61	50	30
12	50	11	30	61	50	30
13	49	05	00	61	12	00
14	49	05	00	61	42	00
15	49	51	50	64	31	26
16	49	19	00	65	41	30
17	49	19	00	67	22	52
18	49	50	00	59	25	00
19	49	25	00	60	00	00
20	49	05	00	60	00	00
21	49	50	00	61	30	30
22	48	30	00	60	00	00
23	49	00	00	63	00	00
24	49	40	20	64	54	50
25	47	44	30	60	25	15
26	47	21	30	60	16	00
27	47	18	30	60	18	00
28	47	32	12	60	42	15
29	47	30	00	60	43	20
30	47	26	45	61	00	00
31	47	50	00	61	08	27
32	47	58	30	61	07	30
33	48	02	30	61	07	00
34	48	31	00	63	08	30
35	49	00	00	63	08	30
36	49	13	15	65	53	30
37	49	21	25	65	35	30
38	49	17	00	64	44	00
39	48	53	30	63	48	54
40	48	45	18	64	09	54
41	47	03	30	64	00	00
42	47	15	00	64	00	00
43	46	37	30	61	30	15
44	47	25	00	63	16	00
45	47	19	30	63	16	00
46	47	19	30	63	23	36
47	47	25	00	63	23	36
48	46	45	00	62	00	00
49	46	27	00	61	58	00
50	46	18	01	62	20	00
51	46	09	00	61	57	00
52	45	59	00	61	36	00
53	45	58	00	61	32	00
54	46	25	40	61	07	00
55	47	02	15	60	24	55
56	47	16	25	60	17	40

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