

**STUDY ON THE OPERATING RESULTS
OF ZONE 12B CRABBERS**

LAURENTIAN REGION



Preliminary report

**Fisheries and Oceans Canada
October 1999**

ACKNOWLEDGMENTS

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COSTS AND REVENUES STUDIES

A TOOL THAT IS USEFUL TO FISHERS FOR DECISION-MAKING

The *Costs and revenues studies*, carried out by Fisheries and Oceans Canada, make it possible to determine the average profitability of fishing fleets as well as their main financial characteristics. These studies are used to orient and evaluate the various measures in the fisheries management field.

Here are a few examples of how *Costs and revenues studies* can be useful to you:

1. FOR FISHING FIRMS

“The Costs and revenues studies present an evaluation of the average performance.”

For fishers, these studies are a management tool allowing them to compare their firm with the fleet average. That way, fishers can:

2 Compare their financial performance with the average observed¹ for the fleet.

For example, fishers can easily zero in on some of their costs which are much higher than the fleet average. The average operating costs as well as certain characteristics of the fleet are reference points for fishing firm managers.

2 Know the average break-even point of the fleet.

The average break-even point of the fleet is an important indication, which makes it possible to determine the landings needed to pay the average fixed and variable costs of the fleet. A fleet that exceeds its average break-even point may, for example, benefit from an amount that can be used to pay wages to the captain and to obtain a profit.

It is important to note that the average break-even point of the fleet, presented in the Study, takes into account only those fixed and variable costs compiled as part of the survey.

2. FOR ALL PLAYERS IN THE FISHERIES SECTOR

“The studies provide a better knowledge of the fisheries sector.”

The Costs and revenues studies allow participants to have an overview of the sector and of the various fishing fleets.

The Policy and Economics Directorate hopes that you enjoy reading this report! If you require additional information, please contact us at (418) 648-3817.

¹ The results presented are averages calculated based on the information collected from fishers and are not a representation of the top performing firms.

INTRODUCTION

This document sketches a financial portrait of zone 12B crabbers. This portrait is the result of a survey carried out among a sample of fishers and deals with the 1998 operating year. The average cash flow and the characteristics of the fleet are presented in this document. Moreover, the analysis includes the notion of the break-even point as well as the various scenarios involving variations in the landing price for snow crab. This study on the operating results takes on particular importance when determining the economic stakes and the financial characteristics of the snow crab fishing fleets.

1. Methodology

This study is based on a survey conducted among zone 12B crabbers between February and March 1999. The fishing zone of these crabbers is illustrated in Appendix 1. The methodology employed to carry out the survey is described in the following section.

1.1 Compilation of data

Zone 12B has 8 crabbers from Québec. Six (6) crabbers were interviewed for the purposes of the study. Moreover, a letter was sent to enterprises chosen at random to facilitate the work of the interviewers and to obtain a high response rate. The interviews with fishers were carried out by two research officers, broken down according to the main geographical regions of the sample. The data were collected from February to March 1999.

A questionnaire drawn up by the Department was also used in the survey. This questionnaire contains all the information pertaining to the needs of the study. It is important to emphasize that this information is confidential in nature and that the results presented in this report are only averages. The main information collected with the help of this questionnaire is described in Appendix 2.

1.2 Validation of data

The data were validated by comparing certain variances from the average for the fleet and by crosschecking with interviewers if an inconsistency was detected. A few adjustments were necessary. Landings are a case in point: some fishers reported landing volumes in various forms. These data were converted to live weight to have a similar basis for comparison purposes.

2. Results and analysis

2.1 Cash flow

Table 1 presents the average gross revenues and the average operating costs in 1998 for the entire sample. These data are used to calculate the average cash flow. The cash flow is a financial result that takes into account the revenues and the outlays made during the year by the fishing firm. It does not take into account the depreciation of assets (which are not outlays), but rather loan repayments made during the year. The cash flow corresponds to the amount available to the owner, after all expenses have been paid.

The cash flow may occasionally be overestimated. Indeed, some expenses, such as maintenance costs can be financed by loans or by funds from previous years, which does not result in any cash outlay for the current fiscal year. Moreover, the calculation of the cash flow that follows takes into account the assumption whereby the owner met all his obligations during the year (with the exception of the finance

charges for which the actual payments are considered). Hence the cash flow is considered as follows:

TOTAL REVENUES *minus* - Variable operating costs (*details in Appendix 2*)
- Fixed operating costs (*details in Appendix 2*)

Total revenues correspond to the sum of the revenues from the sale of fish and other revenues associated with the operations of the fishing firm.

Variable operating costs correspond to the costs directly related to fishing operations as well as the variable costs related to the use of assets other than the boat, such as vehicles, facilities and equipment.

Gear costs include the net acquisition of fishing gear (purchases minus sales) as well as the cost of maintaining and repairing this gear.

Maintenance costs include all the costs incurred to maintain in good working order the assets of the firm, including vehicles, facilities and equipment used on land. However, these costs do not include the costs related to the maintenance and repair of fishing gear.

Fixed operating costs include the fixed annual expenses associated with equipment and facilities such as finance charges, insurance, licences, etc.

Table 1 presents the cash flow of zone 12B crabbers in two ways: for the initial sample and for an adjusted sample. Indeed, as there are relatively few zone 12B crabbers, the sample must contain a sufficient number of crabbers to be representative of the total population. However, some data may produce a variation in the average results due to a major variance with the other data. That is why the results for the cash flow are presented both for the initial sample and for a sample that only comprises those crabbers for whom snow crab is the main source of income. In the analysis, the initial sample is considered for statistical needs (representative sample).

The results (table 1) indicate an average cash flow of \$42,758 for the initial sample, whereas the adjusted sample has a cash flow of \$16,737. This difference is mainly attributable to lower revenues from fishing for the adjusted sample, even though the operating costs are also lower. The following analysis and comments only take into account the initial sample.

If we look at the operating costs, we note that the main cost is that of labour. This expense represents, on average, 27 % of the total operating costs. Crew members' wages are paid on a fixed basis (weekly wages). They represent, on average, 18 % of gross revenues from fishing (without counting the firm's contributions: employment insurance, CSST, etc.). Finally, the average number of crew members is 3. Finance charges also represent a major component of operating costs, ranking second and representing 21 % of the total operating costs.

Generally, fixed costs are the greatest and represent 77 % of the total operating costs. It should be noted that in the case of zone 12B crabbers, labour costs are considered fixed costs.

Table 1
Average cash flow and structure of operating costs
Zone 12B crabbers
1998

	Zone 12B crabbers			
	Basic sample		Modified sample	
	Cash flow (\$)	Share in percentage (%)	Cash flow (\$)	Share in percentage (%)
REVENUES				
Gross revenues				
Gross revenues from fishing	176,768	-	122,181	-
Total revenues	176,768	-	122,181	-
OPERATING COSTS				
Variable costs				
Fuel, oil and grease	9,266	7	8,994	9
Other (bait, dock-side inspections, etc.)	14,609	11	13,838	13
Subtotal:	23,875	18	22,832	22
Fishing gear costs	4,565	3	3,478	3
Maintenance costs	2,901	2	2,841	3
Fixed costs				
Labour costs	35,668	27	29,761	28
Finance charges	28,621	21	22,429	21
Insurance	8,693	6	8,392	8
Other (registration, licences, association, etc.)	29,687	22	15,712	15
Subtotal:	102,669	77	76,293	72
Total operating costs	134,010	100	105,444	100
CASH FLOW	42,758		16,737	

Source: Survey of a sample of fishers

Note: Labour costs are considered fixed as zone 12B crabbers pay wages to fisher helpers on a fixed basis (weekly wages)

Table 2
Average total revenues of owners
Zone 12B crabbers
1998

	<i>Total revenues</i>
<i>Cash flow</i>	<i>42,758</i>
<i>Employment insurance</i>	<i>7,741</i>
<i>Research, tourism cruises, etc.</i>	<i>19,289</i>
<i>Revenues from TAGS program</i>	<i>9,189</i>
<i>Total</i>	<i>78,976</i>

Source: Survey of a sample of fishers

The cash flow does not take into account other revenues such as employment insurance income and revenues from the TAGS program (The Atlantic Groundfish Strategy). Table 2 presents the total revenues of the owner. These revenues are greater than those obtained when we only take into account the revenues directly associated with fishing operations.

2.2 Structure of landings

Table 3
Structure of average landings
Zone 12B crabbers
1998

Species	Average value of landings (\$)	Average landings (kg)	Average landing price (\$/kg)
Snow crab	130,318	40,710	3.20
Shrimp	43,333	30,240	1.43
Turbot	3,117	1,724	1.81
<i>Total</i>	<i>176,768</i>	<i>72,674</i>	

Source: Survey of a sample of fishers

The structure of landings of zone 12B crabbers is made up in large part of snow crab. Indeed, the value of the average landings of this species represents 74 % of the total landings. Shrimp and turbot complement the landings but are only landed by one fisher.

2.3 Characteristics of zone 12B crabbers

Table 4
Characteristics of zone 12B crabbers
(average values)
1998

Description	Zone 12B crabbers
Average age of the fleet	11
Average length of boats	57
Boat purchase cost	\$748,667
Major additions or changes	\$84,350
Depreciation	\$507,132
Value of assets as at December 31, 1998	\$325,885
Balance on loans	\$327,163
Debt/Asset Ratio	1.0

Source: Survey of a sample of fishers

On the basis of this table, we see that the average age of the fleet is 11 years. The initial purchase cost of the boat is \$748,667. Moreover, the major additions or changes represent, on average, \$84,350. These data make it possible to calculate the value of the assets before depreciation. Taking depreciation into account, the value of the assets totals \$325,885 at the end of 1998.

Moreover, by calculating the *debt/asset* ratio, we can determine the proportion that this debt represents in relation to the firm's assets. Zone 12B crabbers have a ratio of 1.0, which means that the debt represents 100 % of the value of the assets.

2.4 Break-even point

The following table presents the quantity of crab needed to reach the break-even point for zone 12B crabbers. This calculation method can be used to analyze the profitability of a firm. In this case, the break-even point makes it possible to calculate the quantity of crab needed to cover all the average expenses (operating costs) of the fleet. When making this calculation, we assume that the landings of other species do not vary.

The break-even point takes into account the fixed costs and variable costs, and is calculated as follows:

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

Where: FC: fixed costs or expenses (\$)

MBFC: margin before fixed costs = $1 - \frac{VC}{Landings}$

VC: variable costs or expenses (\$)

Table 5 presents the snow crab landings needed to reach the break-even point. Any additional quantity of crab allows the captain-owner to have wages.

Table 5
Quantity of crab needed to reach the break-even point
(average values)
Zone 12B crabbers
1998

<i>Description</i>	<i>Units</i>	<i>Zone 12B crabbers</i>
Fixed costs (FC)	\$	102,669
Variable costs (VC)	\$	31,341
Total landings (all species)	\$	176,768
Variable costs / Total landings		0.18
Unit margin before fixed costs (MBFC)		0.82
Break-even point	\$	124,795
CRAB LANDINGS NEEDED TO REACH THE BREAK-EVEN POINT	kg	24,474
VARIANCES WITH ACTUAL CRAB LANDINGS	kg	-16,236

Source: Survey of a sample of fishers

Variable costs represent 18 % of the value of total landings (variable costs/total landings). Hence, \$0.82 per landing dollar remains to cover fixed costs (unit margin before fixed costs). To reach the break-even point, zone 12B crabbers must land 24,474 kg of snow crab, which is less than the actual landings of 1998. Indeed, zone 12B crabbers landed enough crab to reach their break-even point and to allow the captain-owner to have wages.

2.5 Sensitivity analysis: break-even point and landing price of crab

It is interesting to reflect on the impact of a variation in the price of crab. A 10 % increase was made to the landing price of zone 12B crab. It is important to note that variable costs remain the same as the price does not impact on the fishing effort.

The increase in price has an impact on the break-even point as it results in an 11.2 % reduction in the quantities of crab needed. In other words, a 10 % increase in the price of crab reduces the quantity needed to reach the break-even point by 11.2 %. The quantity of crab needed for the zone 12B fleet would only be 21,733 kg.

Table 6
Variation in the quantity of crab needed to reach the break-even point
following a 10 % increase in the price of crab
Zone 12B crabbers
1998

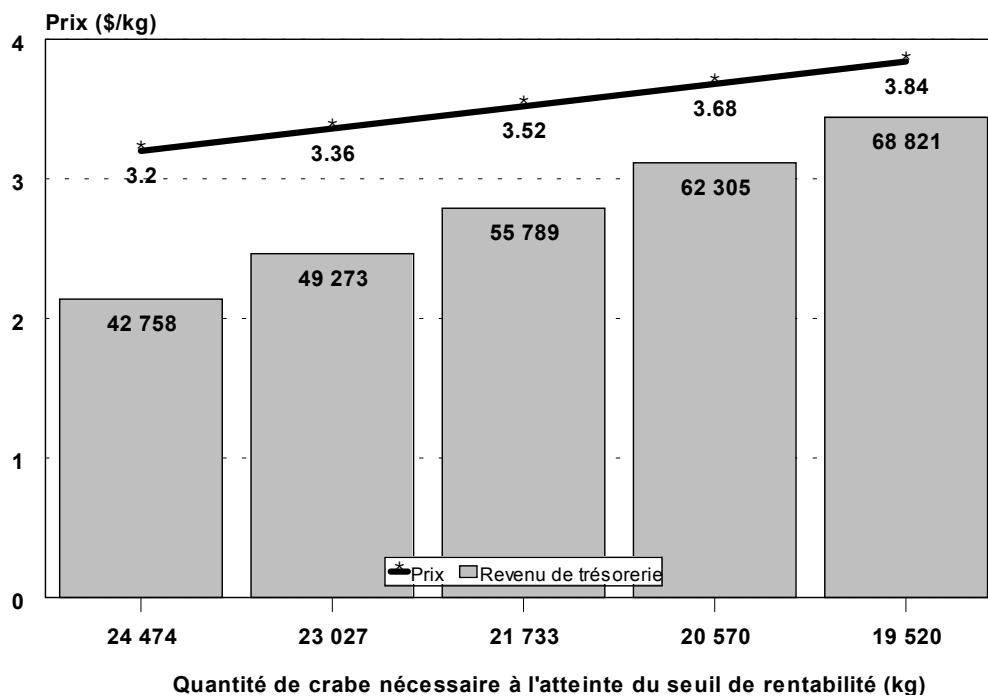
	Units	Zone 12B crabbers	
		Average price	Average price + 10 %
Average price of crab	\$/kg	3.20	3.52
Fixed costs (FC)	\$	102,669	102,669
Variable costs (VC)	\$	31,341	31,341
Total landings	\$	176,768	189,799
Variable costs / Total landings		0.18	0.17
Unit margin before fixed costs (MBFC)		0.82	0.83
Break-even point	\$	124,795	122,976
SENSITIVITY IN % - IN RELATION TO THE BREAK-EVEN POINT	%	1.5 %	
CRAB LANDINGS NEEDED TO REACH THE BREAK-EVEN POINT	kg	24,474	21,733
VARIATION IN %	%	11.2 %	
VARIANCES WITH ACTUAL CRAB LANDINGS	kg	-16,236	-18,977

Source: Survey of a sample of fishers

The following illustration presents the impact of a variation in price on both the break-even point and the cash flow. Several increases were made to the price of crab: 5, 10, 15 and 20 %. The more the price of crab increases, the more the cash flow increases and the break-even point and the quantity of crab needed to reach the break-even point decline. For example, a 15 % variation in price would have the following impact:

- A 3,904 kg or 16 % reduction in the quantity of crab needed to reach the break-even point.
- A \$19,547 increase in the cash flow.

Illustration 1
Impact of a variation in the price of crab on the break-even point
and the cash flow
Zone 12B crabbers



Price (\$/kg)

Price Break-even point

Quantity of crab needed to reach the break-even point (kg)

Sources: Survey of a sample of fishers and DFO estimates

CONCLUSION

The 1998 operating results of zone 12B crabbers allow the fleet to obtain a positive average cash flow. Moreover, crabbers reach their break-even point and land quantities of crab that allow the captain-owner to have wages. The impact of an increase in price is present but does not radically alter the operating results of these crabbers as they already have a positive average cash flow; any increase in price only improves their financial position.

APPENDICES

Appendix 1

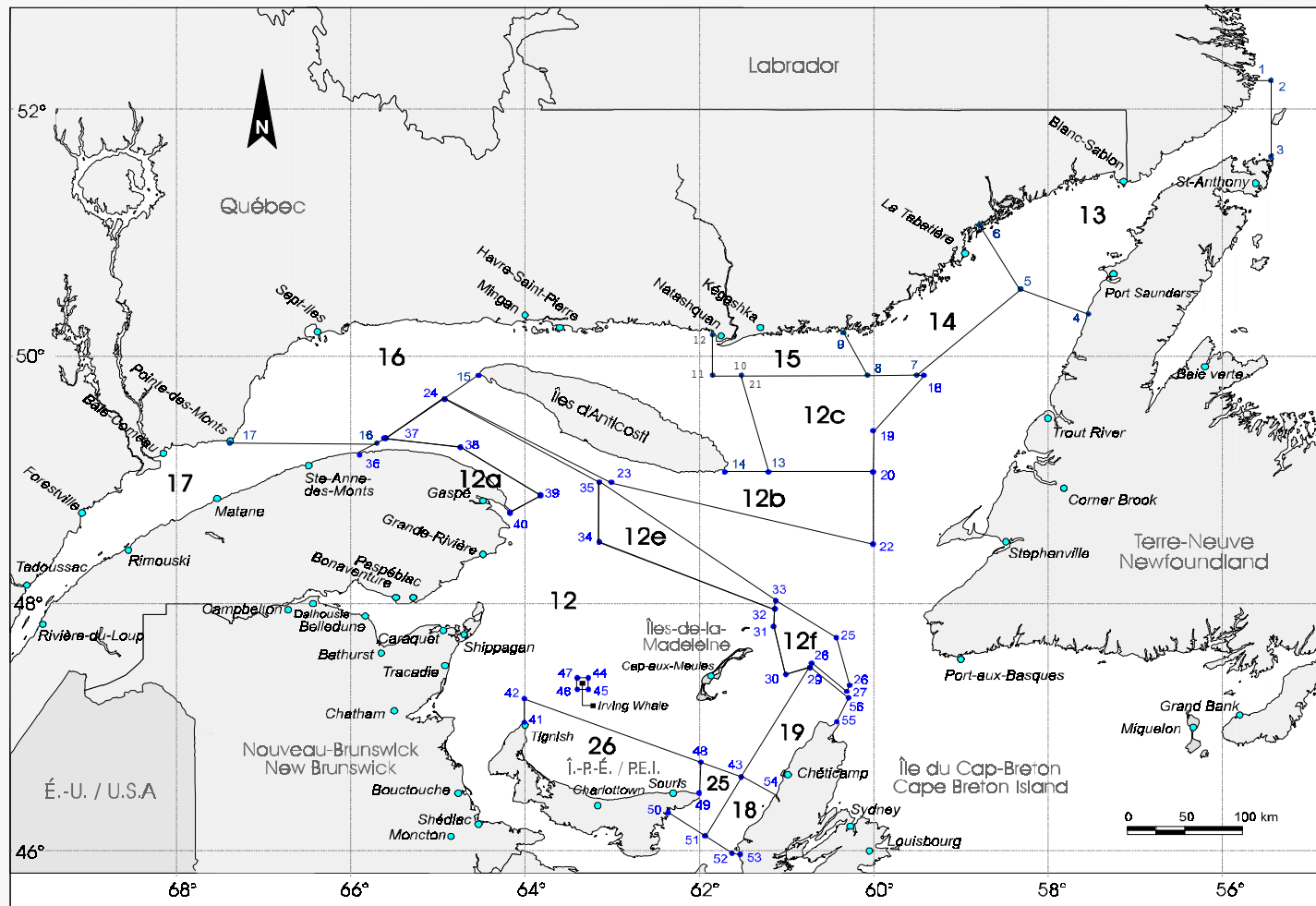


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SECTEUR / SECTOR :
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CARTE DES ZONES DE PÊCHE POUR / FISHING AREAS FOR :
CRABE DES NEIGES / SNOWCRAB



POINTS	LATITUDE NORD / NORTH	LONGITUDE OUEST / WEST
1	52 15 00	55 27 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 52 00	59 25 00
19	49 25 00	60 00 00
20	49 05 00	60 00 00
21	49 52 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 06 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 18 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 43 20
56	47 16 25	60 17 40

Demière mise à jour / last update : 01/10/1998

d : degré / degree m : minute s : seconde

Appendix 2

Main information collected during the survey

- General characteristics of the firm (main boat and second boat)
 - CFVN
 - Length
 - Type of hull
 - Full tonnage
 - Brake horsepower
 - Year construction was completed
 - Year of purchase
- Capital
 - Breakdown of the initial purchase cost according to boat components
 - Major additions or changes made after the purchase
- Fishing effort
 - Number of days at sea and number of weeks by species
 - Number of trips
 - Size of crew per species
- Variable costs
 - Wages and fringe benefits (if any)
 - Fuel, oil and grease
 - Food
 - Bait, ice and salt
 - Boat maintenance and repairs
 - Repairs, replacement and acquisition of fishing gear
 - Dock-side inspections
 - Observers at sea
 - Vehicle expenses
 - Marketing plan
 - Co-management
- Fixed costs
 - Wages and fringe benefits (if any)
 - Registration, licence and immatriculation
 - Wharf charges
 - Boat storage
 - Association
 - Insurance
 - Administrative and legal fees
 - Quota rental
 - Boat rental
 - Interest charges
 - Loan repayment
- Loans
 - Balances
- Various types of revenues
 - Gross revenues from fishing
 - Quota rental revenues
 - Other