TOWARD AN ECONOMIC DATA BASE FOR DESCRIBING THE COMMERCIAL FISH HARVEST SECTOR IN VIRGINIA

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SECTION I: PROBLEM AND OBJECTIVES

Fishery management decision making is a problem of matching the harvest effort applied to fish stocks with the biological potential of the stocks. There are multiple objectives which must be served in the management process including maintenance of the long term biological productivity of the fisheries and promotion of the economic welfare of the fishermen who harvest the stocks. In Virginia the state fishery management policy recognizes these multiple objectives in the following statement:

> It shall be the goal of fisheries management within the Commonwealth of Virginia to conserve and enhance finfish and shellfish resources, and to preserve and promote both commercial and recreational fisheries, and, thereby, to maximize food production and recreational opportunities. The marine resources of the Commomwealth shall be managed for their maximum benefit and long-term use by present and future generations.... Fishery management shall be based upon the best scientific, economic, biological and sociological information available, shall be responsive to the needs of interested and affected citizens, shall promote efficiency in the utilization of the resources, and shall draw upon all available capabilities in carrying out research, administration, management, and enforcement. (Marine Resources Commission)

The ability to consider the economic welfare of the Virginia "waterman" in the management planning process is limited by the absence of basic information to describe the costs and returns of fish and shellfish harvesters in the state. In particular, the economic returns from harvest in the in-shore, primarily

Chesapeake Bay, fishery have not been well studied. There have been aggregate, industry level, studies conducted which have relied on aggregate price and harvest data as a basis for assessing long term trends in the fisheries (JLARC, Thunberg and Shabman, Haven) In turn these studies have been valuable in establishing the general direction of the Virginia fishery management planning process. However,there is virtually no available data or studies on the Virginia fish and shellfish harvest sector at the level of the individual fishing firm.

Without firm level studies it will be difficult to ascertain the positive and negative effects of management actions on the economic welfare of individual fisherman. Because many of the proponents and opponents of any given management action argue their position in terms of the effect on the watermen it is necessary to have a practical basis for complementing industry level studies with firm level studies. There is a need for the establishment of a data base and analytical process to establish the returns and costs of harvest at the individual fishing firm level. The desirable characteristics of an analytical system for harvest cost and returns analysis are the following:

1. The analytical capability should be readily accessible to a number of analysts, preferably through its development for use on personal computers, so that its use in management decision making can be assured.

2. The data base which is used for the analyses should

reflect the most current cost, price and harvest effort conditions. Thus, the there should be resources devoted to continuously updating the data base.

Such an analytical capability will be equally valuable to the individual waterman. Once developed the process for evaluating costs and returns of different levels of fishing effort for different combinations of fishing enterprises can assist the fishing firms in making investment and fishing effort decisions. Also, if generally available computer software were developed it would be of use not only to watermen, but also to the banking sector which makes loans to the watermen and to the VIMS Marine Advisory Service in its financial advising efforts.

A complete analytical system that fulfills the two characteristics noted above can only be developed over a long time period with substantial financial resources. The significant resource requirements that are needed over the long run to make such a system operable should not deter initiating a smaller scale effort to move in the direction of the longer term objective of having the complete analytical system described above. With this in mind the objectives of this study were the following:

1. To survey fishing firms in the Virginia-Chesapeake Bay area to acquire basic data needed for developing a harvest cost and returns analysis.

2. To combine the survey data with secondary data in a computerized model capable of synthesizing costs and returns estimates for alternative combinations of fishing enterprises.

3. To define future study requirements to improve the utility of the returns and cost analysis capability.

To accomplish these objectives a mail survey of a sample of the over 3000 Virginians who hold commercial fishing license holders was conducted. The survey was developed cooperatively by the principal investigators, and was then administered and the results coded onto computer files at the Virginia Institute of Marine Sciences. The computerized records were transferred to Virginia Tech where the results were analyzed and the development of an analytical package using available spread sheet software was accomplished.

SECTION II: THE SURVEY

To accomplish objective a listing of commercial fishing license holders, including licenses held and names and mailing addresses, was obtained from the Virginia Marine Resources Commission. This listing was sorted into groups, where each group included those individuals holding the same combination of licenses. For example, one group included those persons holding only oyster hand tong licenses, a second group included only those holding oyster hand tong and crab pot licenses and so forth.

With these listings by group, researchers at VIMS examined the sorted license list and selected a subset of the listed persons to receive questionnaires in the mail. It was not the intent to assure that through this process that the sample was random. Nor was this an attempt to stratify the sampling process, although this was clearly one result of the procedure. The primary purpose was to be able to tailor the questionnaire sent to the individual to the particular licenses they held. The reason for this will become clear as the scope and length of the questionnaire is described. Of the approximately 3000 license holders on the list, 1850 individuals were selected to receive questionnaires.

Each of the questionnaires was sent with a cover letter

explaining the purpose of the survey and trying to encourage a response. A copy of the letter and the complete questionnaire is included as appendix A. After 3 weeks a post card reminder was sent to each person who had not responded asking them to provide their response as soon as possible. Two weeks after the post card a second letter and questionnaire was sent asking for a response. From this extended mail survey effort 200 surveys were returned, a response rate of 13%. However, not all the surveys were in usable form. Some of the responses needed to be discarded because the respondent was no longer fishing and did not complete the questionnaire. Some of the questionnaires were not completely filled out. In those cases the individual was contacted by mail or by telephone to acquire the missing information. After the complete review of the responses had been completed there were 176 usable questionnaires from the survey effort.

The questionnaire itself had several separate parts. The first section contained questions covering such diverse management issues as the age of the fishermen, the percent of income resulting from commercial fishing, the size and value of commercial vessels and operational costs which are not enterprise specific. Attached to this first part of the questionnaire were separate surveys that were specifically related to the licenses held by the survey respondent. Thus, a survey for crab potters would be sent only to those who held crab pot licenses. The

separate surveys contained questions with regard to basic measures of fishing effort, primary harvesting areas and harvest rates.

The survey questions were all designed to avoid, as much as possible, asking for direct financial disclosure information. Therefore questions were asked in terms of physical production inputs used and harvest rates. In some cases where it was felt that reasonable approximations of costs or inputs could be had from secondary sources, no questions were included on that subject. For example, no question is included on the price paid for motor fuel. The reasons for pursuing this approach were to increase the response rate by minimizing the length of the questionnaire and by avoiding information that might be considered privileged by the respondent.

THE SPREAD SHEET BUDGET ANALYSIS

The overriding purpose of this study was to begin a long term process to develop the capacity to rapidly analyze the harvest costs and returns of the Virginia watermen. In the initial phase of this effort, represented by this study, the focus was upon the harvest of the primary species in the Chesapeake Bay area: oysters, hard blue crabs, hard clams and fin fish (blue fish, trout, spot and croaker). The basis for this effort was the use of "Super-Calc 3" spread sheet software for

the development of harvest budgets.

Budgeting is a planning tool used to compare alternative ways of organizing a business. The ability to develop enterprise and whole firm budgets will be the product of this study. An enterprise is defined in terms of outputs; therefore, the harvest of market oysters by hand tong is an example of an enterprise. In enterprise budgeting a separate budget is constructed, including all the relevant cost and returns data, for each harvest gear and species.

The use of an enterprise budget is not an adequate base for assessing costs and returns for the firm. Enterprise budgets for one or more harvest activities need to be supplemented by cost analysis for the firms vessel and overhead.

The application of the spread sheet software for development of the whole firm budget is described in detail in Appendix B. In general the budget analysis has the following elements:

Enterprise Gross Returns: Each fishing firm will have one or more separate fishing enterprises defined as the harvest of a particular species by a particular gear for one or more harvest seasons. The seasonal harvest depends upon the number of days the firm fishes with the gear in a season, the number of gear units employed and the catch per gear unit. The seasonal harvest can be multiplied by the price received for the harvest to estimate the gross revenues for the season for the enterprise. Summing gross

revenues over all seasons when the harvest occurs yields the annual gross revenue for the enterprise.

Enterprise Specific Fixed Costs: Certain costs of harvest are specific to the enterprise but do not vary with the number of days the enterprise is employed in any season. In this sense these costs are fixed costs. Examples include the cost of a crab pot and the cost of a patent tong. Each of these fixed costs serves the enterprise over one or more harvest seasons. For example a crab pot will last four harvest seasons (about a year and one-half) and the cost of the pot would be prorated to the four seasons. Summing these costs over all seasons when the harvest occurs yields the annual enterprise specific fixed costs for the enterprise.

Enterprise Specific Variable Cost: Certain costs of harvest are specific to the enterprise and do vary with the number of days the enterprise is employed in any season. In this sense these costs are variable costs. Examples include the cost of a bait per day for crab potting, cost of fuel to make the daily run to the fishing grounds and the cost of hired labor per day. Each of these variable costs serves the enterprise only for the day the enterprise is employed. Seasonal enterprise specific variable costs are calculated by multiplying daily costs by the number of days fished in the season. Summing these costs over all seasons when the harvest occurs yields the annual enterprise specific variable costs for the enterprise.

Annual Vessel Costs: In order to be in the business of fishing the waterman must own a vessel. Annual vessel costs which do not vary with enterprises include such factors as insurance, docking costs, property taxes and repair.

Vessel Ownership Costs: These are opportunity costs of vessel ownership as measured by the foregone income which could be earned by selling the vessel at its market value and investing the proceeds in an interest bearing account.

Firm Overhead: These are costs which are incurred to operate the business but which do not vary with the level of firm sales, the vessel or the enterprises the firm employs. The examples here include tax preparation assistance, legal fees and on shore transportation to and from the dock site.

Alternative Wage Costs: These costs are the charges for the own labor of the waterman. The calculation of these costs is made in terms of the gross wage the waterman could earn if he devoted his labor to alternative employment. For waterman who fish a limited number of days and hours per day, this cost is zero. For waterman who fish full time, this cost is the forgone income opportunities in off-water employment.

Performance Measures: The several budget categories above are calculated separately in the spread sheet program. The measures can then be combined to provide alternative economic performance measures for the fishing firm.

o Enterprise net returns - Annual gross revenues for an enterprise less the sum of enterprise specific variable and enterprise specific fixed cost yields enterprise net returns. This allows the analyst to determine whether the enterprise is recovering its own costs through product sales.

o Returns to Vessel, Overhead and Management: Summing enterprise net returns over all enterprises yields an estimate of the revenues available to the firm to cover vessel, overhead and management costs.

o Returns to Management: Subtracting annual vessel costs, costs of vessel ownership and firm overhead from the sum of enterprise net returns yields a measure of the remaining income available to the waterman.

o Rate of Return on Vessel: The vessel owner earns a return by employing the vessel for fishing rather than selling the vessel, working off the water and investing the proceeds of the vessel sale. The return on the vessel is calculated as follows:

$$\frac{\text{Sum of enterprise net returns + annual vessel cost + firm overhead + alternative wage cost}}{\text{vessel market value}}$$

SECTION III: RESULTS FROM THE SURVEY: CHARACTERISTICS OF THE RESPONDENTS

WATERMEN CHARACTERISTICS

The survey procedure did not insure a random sample of survey responses because the survey respondents were only those who were willing to take the time to complete and return the survey form. Therefore the responses may not be representative of all waterman. A representative sample was not the primary goal of this initial study effort. Rather, the sampling strategy was one which sought to encourage as many responses as possible (without pursuing responses from reluctant non-respondents). With this caveat in mind it will be useful to examine some of the general survey results as they can be used to describe the characteristics of those who did respond to the survey.

Licenses Held: There were 14 different license categories reported by the 176 survey respondents. Among these 176 respondents there were 69 different license combinations. This does not suggest that the holding of a license meant that the waterman actually engaged in the fishing activity permitted by the license. In fact there were numerous cases where a license was held but the level of fishing effort which required that license was minimal. Clearly license holding is a poor proxy for the amount of fishing effort.

Several of the license combinations were held by only 1 or two waterman. The most common combinations of licenses are listed in Table 1. All other combinations had 3 or less respondents in the survey. The alternative way to examine these data are to list the number who held a license without regard to their holding any other license. Table 2 displays the results in this format.

Age, and Fishing Experience and Gear Type: The respondents average age was 46 years and the average years of fishing experience was 17 years. Tables 3 and 4 display the distribution of age and experience among the respondents. Table 5 displays the age in terms of the years of fishing experience.

Several items are of interest. First, the respondents were elderly, with nearly forty percent being over 51 years of age. Not surprisingly, the respondents also had substantial years of experience in fishing. Table 5 shows that age and experience do not appear to be closely linked in all cases. Thus, for example, 16 of the 23 respondents with five or less years of experience were greater than 31 years old; 23 of the 39 respondents with 6-10 years of experience were greater than 31 years old. Apparently, some of the watermen respondents did not initially choose that career, but rather entered fishing later in life. Table 6, gear type by age, shows that many of the older watermen were crab potting. However, no clear pattern between age and license held appears from the table.

Residence: The residence of the respondents is displayed in Table 7. Table 8 shows the residence where the primary vessel was docked. Table 9 displays the respondents residence in relation to the county in which their fishing vessel was docked during the year. It appears from this table that most watermen fish in the area where they live.

Importance of Fishing as an Income Source: The respondents were asked to estimate the percent of their 1985 income which was earned from fishing. Table 10 displays these results. The respondents in the survey earned varying amounts of their income from fishing and 31.8 percent earned less than 50% percent of their income from commercial fishing. Seventy four of the 176 respondents earned all their 1985 income form commercial fishing.

Table 11 displays the percentage of income from fishing versus age. As the age increases the percentage of income from fishing is less. For the younger respondents fishing appears to be full time employment and for the older respondents fishing is an income supplement.

Table 12 displays the percentage of income in terms of gear type employed. Most of those who only crab pot or gill net earned less than fifty percent fo their income from fishing. Most of those who earned all their income from fishing relied in part or exclusively upon the oyster fishery.

Vessel Characteristics

Material, Length and Age: Tables 13, 14 and 15 report the characteristics of the vessels owned by the respondents. Most vessels were wood (69.3%) and fiberglass construction (21.0%). Vessel lengths were uniformly distributed. The age of the vessels (table 15) shows that many fo the vessels owned were quite old. Table 16 suggests that there is no clear relationship between vessel length and gear type.

Engines: Engine types were nearly evenly divided between inboard and outboard (table 17). Engine horsepowers varied over a wide range (table 18). Engine ages ranged mainly frome zero to ten years (table 19). Fuel use per hour was most often less than eight gallons per hour (table 20). Table 20 suggests that fuel use will be a significant cost of harvest.

Vessel And Engine Costs

Acquistion: Tables 21 through 28 offer insight into how the respondents acquired their vessels and engines. Vessels are often purchased, as opposed to inherited, gift, etc. Vessel purchase prices are skewed toward the lower end of the price distribution. Most respondents have purchased their current engine separate frome the vessel. Like vessels, a substantial number of engines are purchased at prices skewed toward the lower end of the price distribution used in the survey. Few

respondents finance their vessel purchases. Table 28 indicates that few individuals purchase insurance for their vessels.

Other Costs: Few respondents incur cost for docking their boats (table 29). Table 30, 31, 32 and 33 show that the respondents do spend substantial sums, relative to purchase price, to maintain and repair their vessels and engines. Table 34 makes clear that the wooden craft (the older vessels) are the ones for which most repair costs are incurred.

Discussion

There are numerous possible interpretations of the data presented in the preceding tables. It would be inappropriate to generalize because there appear to be few generalizations about the respondents. They cover a wide age and experience, use many gear types, live throughout the region, and include some persons who rely entirely upon fishing for their income and others for whom fishing is a modest income supplement. It does appear that most of the vessels are old and have little salvage value. Major cost are incurred for maintenance and repair, however this varies by type of construction material for the vessel.

The message of this diversity is an important one for a study of this type. It would be dangerous to interpret the sample budgets provided below as representative of an average waterman. For this reason, the budgets which are developed must be seen as illustrations of the use of the budget analysis

format. Future use of these data, or studies to apply these data and models to a fishery management problem, should be careful to specify the characteristics of the waterman's situation being analyzed.

Table 1: Most Frequent Gear Combinations Among Fisherman

License Held	Frequency
Crab Pot and Gill Net	27
Crab Pot	16
Crab Pot and Patent Tong Oysters	12
Crab Pot and Hand Tong Oysters	9
Crab Pot, Patent Tong Oysters and Gill Net	6
Clam Patent Tong	5
Gill Net	5
Seed Oyster	4
Oyster, Hand Tong and Patent Tong	4
Oyster Hand Tong and Seed Oyster	4
Oyster Hand Tong, Seed Oyster and Clam Patent Tong	4

Table 2: License Held by Frequency

License Held	Frequency	Percent
Crab Pot	111	63.0
Gill Net	77	43.75
Oyster Patent Tong or Dredge	49	27.8
Oyster Hand Tong	42	23.8
Clam Patent Tong	33	18.75
Pound Net	13	7.3
Crab Dredge	12	6.8
Seed Oyster	12	6.8
Crab Scrape	6	3.4
Crab Trap	6	3.4
Peeler Pot	6	3.4
Crab Net	2	1.1
Crab Shedding	1	.56
Purse Seine	1	.56

Table 3: Age Of The Fisherman

Age	Frequency	Percent	Cumulative Frequency	Cumulative Percent
16-30	30	17.04	30	17.04
31-30	43	24.43	73	14.47
41-50	37	21.03	110	62.50
51-60	33	18.75	143	81.25
Over 69	33	18.75	176	100.00

Table 4: Years Of Experience

Years	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1-5	23	13.06	23	13.06
6-10	40	22.72	63	35.78
11-15	32	18.18	95	53.96
16-20	23	13.06	118	67.02
21-25	11	6.25	129	73.27
Over 25	44	25.00	174	98.27
N.A	2	1.73	176	100.00

Table 5: Age Of Fisherman VS. Years Fished

Experience \ Age	16-30	31-40	41-50	51-60	60-80
0-5	7	3	5	3	5
6-10	16	12	7	2	2
11-15	7	14	5	4	2
16-20	0	8	7	3	5
21-25	0	3	2	6	0
26-60	0	2	11	15	19
N.A.	0	0	1	0	0

Table 6: License Held VS. Age Of Fisherman

License \ Age	16-30	31-40	41-50	51-60	61-79
Crab Pot	15	19	25	26	26
Crab Dredge	1	4	1	4	2
Oyster Hand Tong	13	11	8	3	7
Oyster Patent Tong	9	15	10	10	5
Seed Oyster	7	2	2	0	1
Clam Patent Tong	9	11	4	4	5
Pound Net	2	1	4	1	5
Gill Net	7	17	14	11	22
Crab Scrape	2	2	0	1	1
Crab Trap	0	1	3	0	2
Peeler Pot	2	0	1	2	1
Crab Net	1	0	0	1	0
Crab Shedding	0	0	0	1	0
Purse Seine	0	1	0	0	0

Table 7: Waterman's Home

County	Frequency	Percent
Lancaster	26	14.8
Accomack	25	14.2
Northumberland	22	12.5
Matthews	17	9.6
Poguoson	11	6.3
Gloucester	10	5.6
Westmoreland	10	5.6
North Hampton	9	5.1
York	7	3.9
Middlesex	7	3.9
King William	5	2.8
Hampton	4	2.3
Richmond	4	2.3
Va. Beach	3	1.7
Stafford	2	1.1
Suffolk	2	1.1
Newport News	2	1.1
King George	1	.6
Norfolk	1	.6
Prince William	1	.6
Isle of Wright	1	.6
N N	1	.6
N.A.	5	2.8

Table 8: Location Of Vessel Dock:

County	Frequency	Percent
Accomack	26	14.7
Lancaster	26	14.7
Northumberland	21	11.9
Matthews	18	10.2
Westmoreland	13	7.3
Poguoson	12	6.8
Hampton	8	4.5
North Hampton	8	4.5
Gloucester	6	3.4
Middlesex	6	3.4
York	5	2.8
Va. Beach	5	2.8
Richmond	4	2.3
King William	3	1.7
Stafford	2	1.1
James City	1	.6
Norfolk	1	.6
Prince William	1	.6
Suffolk	1	.6
West Point	1	.6
Isle Of Wright	1	.6
Tangier Isle	1	.6
Newport News	1	.6
North Hampton and Lancaster	1	.6
N N	1	.6
N.A.	1	.6

Table 9: Where The Fisherman Lives VS. Where The Fisherman Docks His Vessel-By County

Waterman's Home	Dock Site	Frequency
Poguoson	Poguoson	11
Gloucester	Gloucester	6
Westmoreland	Westmoreland	10
Accomack	Accomack	24
Northumberland	Northumberland	20
King William	King William	2
North Hampton	North Hampton	8
Lancaster	Lancaster	26
York	York	5
Hampton	Hampton	4
Suffolk	Suffolk	1
King and Queen	King and Queen	0
Matthews	Matthews	17
Middlesex	Middlesex	5
Va. Beach	Va. Beach	0
Stafford	Stafford	2
Norfolk	Norfolk	1
Prince William	Prince William	1
Richmond	Richmond	4
Isle Of Wright	Isle Of Wright	1
Newport News	Newport News	1
N N	N N	1
Gloucester	Hampton	2
Gloucester	Matthews	1
Gloucester	Middlesex	1
Accomack	Tangier Isle	1
North Umberland	Westmoreland	1
North Umberland	Hampton	1
King William	Westmoreland	1
King William	West Point	1
North Hampton	King William	1
York	James City	1
York	Poguoson	1
Suffolk	Va. Beach	1
Middlesex	Northumberland	1
Va. Beach	Northumberland	3
Newport News	No Reponse	1

Table 10: Percentage Of Income Earned From Commercial Fishing

Percentage	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-49	56	31.8	56	31.8
50-89	27	17.1	83	47.2
90-100	83	47.1	166	94.3
N.A.	10	5.7	176	100.0

Table 11: Age Of Waterman VS. Percentage Of Income Earned From Commercial Fishing

Percentage of Income AGE	0-50	51-90	91-100	N.A.
0-30	6	4	20	0
31-40	15	2	23	3
41-50	11	4	20	2
51-60	14	3	15	1
Above 60	21	3	5	4

Table 12: Gear Type VS. Percentage Of Income Earned By Commercial Fisherman

Percentage Income Gear Combination	0-50	51-90	91-100	N.A.
Crab Pot And Gill Net	19	1	4	3
Crab Pot	13	1	2	0
Crab Pot and Patent Tong Oysters	0	0	12	0
Crab Pot and Hand Tong Oysters	1	0	6	2
Crab Pot, Patent Tong Oysters and Gill Net	1	1	4	0
Clam Patent Tongs	1	3	0	1
Gill Net	3	0	2	0
Oyster By Patent Tongs	3	0	0	1
Oyster, Patent Tong and Hand Tong	1	0	2	1
Oyster Hand Tong and Seed Oyster	0	0	4	0
Oyster Hand Tong, Seed Oyster and Clam Patent Tong	0	1	3	0

Table 13: Construction Material Of The Vessel

Material	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Wood	122	69.3	122	69.3
Fiberglass	37	21.0	159	90.3
Aluminum	8	4.5	167	94.9
Wood and Fiberglass	8	4.5	175	99.4
Wood and Aluminum	1	.6	176	100.0

Table 14: Length Of Vessel

Feet	Frequency	Percent	Cumulative Frequency	Cumulative Percent
11-20	52	29.5	52	29.5
21-30	33	18.8	85	48.3
31-40	64	36.4	149	84.7
41-64	27	15.3	176	100.0

Table 15: Age Of Vessel

Years	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-10	77	43.7	77	43.7
11-20	40	22.8	177	66.5
21-30	30	17.0	147	83.5
31-40	15	8.5	162	92.0
Above 40	8	4.6	170	96.0
N.A.	6	3.4	176	100.0

Table 16: Gear Type VS. Length Of Vessel

Vessel Length Gear Combination	0-20	21-30	31-40	41-64
Crab Pot and Gill Net	14	10	3	0
Crab Pot	12	3	1	0
Crab Pot and Patent Tong Oysters	0	2	9	1
Crab Pot and Hand Tong Oysters	4	2	2	1
Crab Pot, Patent Tong Oysters and Gill Net	0	2	4	0
Clam Patent Tong	2	0	3	0
Gill Net	2	2	1	0
Oyster by Patent Tong	0	0	4	0
Oyster, Hand Tong and Patent Tong	0	0	2	2
Oyster Hand Tong and Seed Oyster	0	0	3	1
Oyster Hand Tong, Seed Oyster and Clam Patent Tong	0	0	3	1

Table 17: Type Of Engine

Engine	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Inboard	99	56.3	99	56.3
Outboard	74	42.0	173	98.3
N.A.	3	1.7	176	100.0

Table 18: Horsepower Of The Engine

H. P.	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-50	40	22.7	40	22.7
51-100	28	15.9	68	38.6
101-150	37	21.1	105	59.7
More Than 150	64	36.3	169	96.0
N.A.	7	4.0	176	100.0

Table 19: Age Of The Engine

Years	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-2	41	23.3	41	23.3
2.1-5	36	20.4	77	43.7
5.1-10	53	30.2	130	73.9
More Than 10	32	18.1	162	92.0
N.A.	14	8.0	176	100.0

Table 20: Fuel Use Per Hour

Gallons	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-2	75	46.6	75	42.6
2.1-4	45	25.6	120	68.2
4.1-6	23	13.0	143	81.2
6.1-8	10	5.7	153	86.9
More Than 8.1	5	2.9	158	89.8
N.A.	18	10.2	176	100.0

Table 21: Condition In Which The Vessel Was Purchased

Condition	Frequency	Percent	Cumulative Frequency	Cumulative Percent
New	63	36.2	63	36.2
Used	84	48.3	147	84.5
Other	27	15.5	176	100.0

Table 22: Purchase Price Of The Vessel

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	28	17.1	28	17.1
1-2000	50	28.6	78	45.7
2001-5000	30	15.3	108	61.0
5001-10000	28	21.9	136	82.9
10001-15000	11	5.5	147	88.4
15001-25000	12	7.9	159	96.3
25001-30000	5	3.7	164	100.0
N.A.	12	.	.	.

Table 23: How Vessel Was Obtained

How Obtained	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Purchased	142	81.6	142	81.6
Inherited	10	5.7	152	87.4
Gift	8	4.6	160	92.0
Leased	1	.6	161	92.5
Investor	2	1.1	163	93.7
Self Built	7	4.0	170	97.7
Contractor	2	1.1	172	98.9
Financed	2	1.1	174	100.0
N.A.	2	.	.	.

Table 24: Engine Purchased Separately From Vessel

Response	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	127	73.8	127	73.8
No	45	26.2	172	100.0
N.A.	4	.	.	.

Table 25: Purchase Price Of The Engine

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	42	25.3	42	25.3
1-1000	32	16.9	74	42.2
1001-2000	23	15.6	97	57.8
2001-3000	19	8.5	116	66.3
3001-4000	18	11.4	134	77.7
4001-5000	12	10.3	146	88.0
5001-10000	14	7.8	160	95.8
10001-21800	6	4.2	166	100.0
N.A.	10	.	.	.

Table 26: Percentage Of The Price Financed (Vessel and Engine)

Percentage	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	129	75.0	129	75.0
1-50	7	4.1	136	79.1
51-89	8	4.6	144	83.7
90-100	28	16.3	172	100.0
N.A.	4	.	.	.

Table 27: Insurance Premium For Vessel And Crew In 1985

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	117	75.0	117	75.0
1-200	12	7.7	129	82.7
201-400	11	7.0	140	89.7
401-600	5	3.2	145	92.9
Over 600	11	7.0	156	100.0
N.A.	20	.	.	.

Table 28: Dock Fee

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	101	57.4	101	57.4
1-100	9	5.1	110	62.5
101-200	19	10.8	129	73.3
201-300	7	4.0	136	77.3
301-400	7	3.9	143	81.2
401-500	13	7.4	156	88.6
Over 500	4	1.1	160	90.9
N.A.	16	9.1	176	100.0

Table 29: Cost For Maintenance And Repair In 1983

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-500	48	27.3	48	27.3
501-1000	36	20.4	84	47.7
1001-2000	22	12.5	106	60.2
2001-3000	16	9.1	122	69.3
3001-5000	14	8.0	136	77.3
Over 5000	12	6.8	148	84.1
N.A.	28	15.9	176	100.0

Table 30: Cost For Maintenance And Repair In 1984

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-500	48	27.3	48	27.3
501-1000	30	17.0	78	44.3
1001-2000	29	16.5	107	60.8
2001-3000	17	9.7	124	70.5
3001-5000	17	9.6	141	80.1
Over 5000	26	14.8	176	100.0

Table 31: Cost For Maintenance And Repair In 1985

Dollars	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-500	51	29.0	51	29.0
501-1000	28	15.9	79	44.9
1001-2000	33	18.7	112	63.6
2001-3000	15	8.6	127	72.2
3001-5000	15	8.5	142	80.7
Over 5000	18	10.2	160	90.9
N.A.	16	9.1	176	100.0

Table 32: Total Cost For Maintenance And Repair During The Past Three Years

Cost	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-1000	33	18.7	33	18.7
1001-2000	24	13.7	57	32.4
2001-3000	13	6.2	68	38.6
3001-4000	14	8.0	82	46.6
4001-5000	8	4.5	90	51.1
5001-6000	8	4.6	98	55.7
6001-7000	7	4.0	105	59.7
7001-8000	6	3.4	111	63.1
8001-9000	9	5.1	120	68.2
9001-10000	4	2.3	124	70.5
10001-11000	5	2.8	129	73.3
11001-12000	1	.6	130	73.9
12001-13000	3	1.7	133	75.6
13001-14000	4	2.2	137	77.8
14000-15000	1	.6	138	78.4
Over 15000	22	12.5	160	90.9
N.A.	16	9.1	176	100.0

Table 33: Total Cost For Maintenance And Repair During The Past Three Years VS. Construction Material

Cost	Wood	Fiberglass	Aluminum	Wood Fiberglass	Wood Aluminum
0-1000	12	12	5	3	1
1001-2000	17	6	0	1	0
2001-3000	7	2	1	1	0
3001-4000	9	4	0	1	0
4001-5000	7	1	0	0	0
5001-6000	8	0	0	0	0
6001-7000	4	3	0	0	0
7001-8000	5	0	0	1	0
8001-9000	9	0	0	0	0
9001-10000	4	0	0	0	0
10001-11000	5	1	0	0	0
11001-12000	1	0	0	0	0
12001-13000	3	0	0	0	0
13001-14000	2	2	0	0	0
14001-15000	1	0	0	0	0
Over 15000	28	6	2	1	0

SECTION IV: SAMPLE BUDGETS FOR CHESAPEAKE BAY WATERMEN

The data base that was made available through the survey process offers an opportunity applying the spread sheet program to at least 176 separate firms-- that is, to each of the individual respondents. In addition, as will be described below, the budget analysis template was developed to accommodate additional enterprises which were not part of the original survey questionnaire. Examples of this case are the possibility of peeler crab harvest and the possibility of the harvesters doing some value added processing before sale, such as crab shedding. However to conduct the analysis for all the possible gear combinations was not the primary purpose of this work. THE PRIMARY PURPOSE OF THIS STUDY WAS TO BEGIN THE DEVELOPMENT OF A COMPUTER BASED RETURNS/COST ANALYSIS CAPABILITY FOR APPLICATION TO SPECIFIC SITUATIONS AS THEY ARISE. Therefore, the budget results reported below were chosen to illustrate the result for an average firm fishing the primary gear combinations for the key species in the Bay: hard blue crabs, oysters from public grounds, hard clams and fin fish. The choice to develop an "average" firm budget analysis depended upon having some survey records which could be applied for the budget analysis, which also meant that the budget represented a frequently used gear combination. The input data needed were not taken entirly from

the survey results. Therefore, the entire data input is reported for each sample budget. The reader can judge the representiveness of the results achieved by examining the input data. With this in mind the following sample budgets were developed:

Single Gear Budgets

* Crab Pot
* Oyster Patent Tong on Public Grounds
* Clam Patent Tong

Two Gear Budgets

* Crab Pot and Oyster Hand Tong on Public Grounds
* Crab Pot and Oyster patent Tong on Public Grounds
* Crab and Gill Net
* Oyster Hand Tong and Oyster Patent Tong on Public Grounds
* Oyster Hand Tong and Seed Oyster on Public Grounds

Three Gear Budgets

* Crab Pot, Oyster Hand Tong, Oyster Patent Tong on Public Grounds
* Crab Pot, Oyster Patent Tong on Public Grounds, Gill Net

For a detailed discussion of the use and format of the spread sheet program see Appendices B. The next section of this report displays the data used in constructing sample cost and return budgets. The presentation of these data is followed by a report of the results of the analysis.

BUDGET INPUT DATA

Tables 34-43 list the input data used in constructing the sample firm budgets. These data are reported in their entirety so that the reader will completeley understand the inputs which yield the results reported in tables 44, 45 and 46. In this manner the reader can independently judge how representative they feel the the budgets are of actual fishing conditions. Recall that much of the data input is taken from the survey responses.

Table 34: Crab Pot Budget Data

Alternative Wage Cost = No Cost

Annual Vessel Cost * = Dockage ($9.37) + Insurance ($6.81) + Maintenance ($412.2) + Taxes ($54.96)

Purchase Price of the Vessel (Engine Included) * = $2748.27

Vessel Ownership Cost = $274.83

Firm Overhead= Accounting ($100.0) + Transportation ($475.44) + Other Costs ($100.00)

Enterprise Data:

	Spring	Summer	Fall
Price/bushel	10.24	7.24	8.54
# Pots Fished/Day *	36.0	54.0	42.0
# Days Fished/Wk. *	3.2	4.4	3.8
# Weeks Per Season	6.0	13.0	6.0
Catch Per Pot (Bu) *	.105	.108	.125
Cost Of A Pot	17.00	17.00	17.00
Life Of A Pot/Seasons	4.00	4.00	4.00
Fuel Use Per Hour *	4.05	4.05	4.05
Hours Fished Per Day *	2.06	2.85	2.59
Price Of Fuel	1.10	1.10	1.10
Bait Cost Per Pound	.10	.10	.10
Bait Per Pot *	1.425	.844	1.219
Other- Gloves/Day	1	1	1

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price, bait cost and cost for gloves/day were developed from secondary sources.

Table 35: Oyster Patent Tong Budget Data

Alternative Wage Cost = $7800.00 (130 days * $60.00/day)

Annual Vessel Cost * = Dockage ($66.00) + Insurance ($430.00) + Maintenance (2082.05) + Taxes ($101.04)

Purchase Price of the Vessel (Engine Included) * = $5052.25

Vessel Ownership Cost = $505.22

Firm Overhead = Accounting ($100.00) + Transportation ($464.1) + Other Costs ($100.00)

Enterprise Data: Patent Tongs

	Fall	Winter
Price/Bushel	11.98	11.85
# Patent Tongs Fished/Day	1.0	1.0
# Days Fished Per Week *	4.25	4.25
# Weeks Per Season	8.0	8.0
Catch Per Patent Tong (Bu) *	15.125	15.125
Cost Of Patent Tong	450.0	450.0
Life Of A Patent Tong/Seasons	30.0	30.0
Fuel Use Per Day *	12.5	12.5
Vessel Use/Season/Days	34.0	34.0
Price Of Fuel	1.1	1.1
Labor Cost/Week *	183.33	183.33
Labor Weeks Per Season	8.0	8.0
Other- Gloves/Day	1	1

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear cpsts, life of gear, fuel price and cost for gloves per day were developed from secondary sources.

Table 36: Clam Patent Tong Budget Data

Alternative Wage Cost = $5100 (85 days * $60.00/day)

Annual Vessel Cost * = dockage ($166.0) + Maintenance ($6086.66) + Taxes ($119.70)

Purchase Price of the Vessel (Engine Included) * = $5985

Vessel Ownership Cost = $598.5

Firm Overhead= Accounting ($100.0) + Transportation ($546) + Other Costs ($100)

Enterprise Data:

	Fall	Winter	Spring	Summer
Price/Bushel	20.0	15.36	21.24	21.12
# Tongs Fished/Day	1.0	1.0	1.0	1.0
# Days Fished Per Week *	2.75	1.75	2.25	3.25
# Weeks Per Season	10.0	4.0	8.0	10.0
Catch Per Tong (Bu.) *	13.0	16.375	17.125	16.375
Cost Of A Patent Tong	625	625	625	625
Life Of A Tong/Seasons	30	30	30	30
Fuel Use Per Day *	9.16	9.16	9.16	10.25
Vessel Use/Season/Days	27.5	7.0	18.0	32.5
Price Of Fuel	1.1	1.1	1.1	1.1
Other- Gloves/Day	1.0	1.0	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price and cost for gloves per day were developed from secondary sources.

Table 37: Crab Pot and Oyster Hand Tong Budget Data

Alternative Wage Cost = $15600 (260 days * $60.00/day)

Annual Vessel Cost * = Dockage ($71.42) + Insurance ($72.85) + Maintenance ($1429.12) + Taxes ($102.6)

Purchase Price of the Vessel (Engine Included) * = $5130.62

Vessel Ownership Cost = $513.06

Firm Overhead = Accounting ($100.0) + Transportatation ($828.36) + Other Costs ($100.0)

Enterprise Data - Crab Pot

	Spring	Summer	Fall
Price/Bushel	10.24	7.24	8.54
# Pots Fished/Day *	155.00	167.75	175.71
# Days Fished/Wk *	4.0	5.0	4.71
# Week Per Season	8.0	13.0	4.0
Catch Per Pot (Bu.) *	.068	.095	.086
Cost Of A Pot	17.0	17.0	17.0
Life Of A Pot/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	2.375	2.375	2.375
Hours Fished Per Day *	3.92	5.125	3.66
Price Of Fuel	1.1	1.1	1.1
Labor Cost/Wk. *	22.22	22.22	22.22
Labor Weeks/Season *	2.64	4.29	1.32
Bait Cost Per Pound	.10	.10	.10
Bait Per Pot (Pounds)*	1.064	1.064	1.023
Other- Gloves/Day	1.0	1.0	1.0

Table 37 Cont'd: Oyster Hand Tong Enterprise Data

	Fall	Winter
Price/Bushel	11.98	11.85
# Hand Tongs Fished/Day *	1.0	1.0
# Days Fished/Week *	3.71	3.0
# Weeks Per Season	6.0	10.0
Catch Per Hand Tong (Bu) *	5.625	4.85
Cost Of A Hand Tong	60.0	60.0
Life Of Hand Tong/Seasons	6.0	6.0
Fuel Use Per Day *	4.1875	4.1875
Vessel Use/Season/Days	22.26	30.0
Price Of Fuel	1.1	1.1
Other- Gloves/Day	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price, bait cost and cost for gloves per day were developed from secondary sources.

Table 38: Crab Pot and Oyster Patent Tong Budget Data

Alternative Wage Cost = $15600 (260 days * $60.00/day)

Annual Vessel Cost * = Dockage ($146.66) + Insurance ($130) Maintenance ($1925.08) + Taxes (212.27)

Purchase Price of the Vessel (Engine Included) * = $10602.27

Vessel Ownership Cost = $1060.22

Firm Overhead = Accounting ($100) + Transportation ($924.57) + Other Costs ($100)

Enterprise Data - Crab Pot

	Spring	Summer	Fall
Price/Bushel	10.24	7.24	8.54
# Pots Fished/Day *	225.0	214.0	219.0
# Days Fished/Wk. *	5.36	5.81	5.81
# Weeks Per Season	8.0	13.0	4.0
Catch Per Pot (Bu) *	.0788	.1048	.1103
Cost Of A Pot	17.0	17.0	17.0
Life Of A Pot/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	2.79	2.79	2.79
Hours Fished Per Day	6.5	6.05	6.15
Price Of Fuel	1.1	1.1	1.1
Labor Cost/Wk. *	36.36	36.36	36.36
Labor Weeks/Season	3.636	7.09	1.818
Bait Cost Per Pound	.10	.10	.10
Bait Per Pot (Pounds) *	.5748	.7838	.7173
Other- Gloves/Day	1.0	1.0	1.0

Table 38 Cont'd: Oyster Patent Tong Enterprise Data

	Fall	Winter
Price/Bushel	11.98	11.85
# Patent Tongs Fished/Day *	1.0	1.0
# Days Fished/Week *	4.25	4.25
# Weeks Per Season	6.0	10.0
Catch Per Patent Tong *	11.7	11.7
Cost Of A Patent Tong	450.0	450.0
Life Of A Patent Tong/Seasons	30.0	30.0
Fuel Use Per Day *	15.5	15.5
Vessel Use/Season/Days	25.5	42.5
Price Of Fuel	1.1	1.1
Labor Cost/Week	104.27	104.27
Labor Weeks/Season	4.36	7.27
Other- Gloves/Day	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price, bait cost and cost for gloves per day were developed from secondary sources.

Table 39: Crab Pot and Gill Net Budget Data

Alternative Wage Cost = $11700 (195 days * $60.00/day)

Annual Vessel Cost * = Dockage ($30.65) + Insurance ($188) + Maintenance ($1037.43) + Taxes ($77.21)

Purchase Price of the Vessel (Engine Included) * = $3860.78

Vessel Ownership Cost = $386.07

Firm Overhead = Accounting ($100) + Transportation ($627.17) + Other Costs ($100)

Enterprise Data - Crab Pot

	Spring	Summer	Fall
Price/Bushel	10.24	7.24	8.54
# Pots Fished/Day *	82.00	82.00	80.00
# Days Fished/Wk. *	4.93	5.29	5.14
# Weeks Per Season	8.0	13.0	8.0
Catch Per Pot (Bu) *	.065	.0734	.0767
Cost Of A Pot	17.0	17.0	17.0
Life Of A Pot/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	4.08	4.08	4.08
Hours Fished Per Day *	3.60	3.79	3.59
Price Of Fuel	1.1	1.1	1.1
Bait Cost Per Pound	.10	.10	.10
Bait Per Pot (Pounds) *	.8495	.8939	.9215
Other- Gloves/Day	1.0	1.0	1.0

Table 39 Cont'd: Gill Net Enterprise Data

	Spring	Summer	Fall
Price Per Pound:			
Bluefish	.163	.176	.17
Trout	.577	.506	.448
Croaker	.277	.31	.304
Spot	.26	.329	.503
# Nets Fished/Day *	2.4	2.4	2.4
# Days Fished/Wk. *	4.478	4.478	4.478
# Weeks/Season	4.0	13.0	8.0
Catch Per Gill Net(Lbs)*			
Bluefish	19.22	19.22	19.22
Trout	25.59	25.59	25.59
Croaker	9.104	9.104	9.104
Spot	13.56	13.56	13.56
Cost Of A Gill Net *	313.60	313.60	313.60
Life Of A Net/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	4.08	4.08	4.08
Hours Fished Per Day *	3.88	3.88	3.88
Price Of Fuel	1.10	1.10	1.10
Labor Cost/Wk. *	14.73	14.73	14.73
Labor Weeks/Season	2.11	6.86	4.22
Other- Gloves/Day	1.0	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price, bait cost and cost for gloves per day were developed from secondary sources.

Table 40: Oyster Hand Tong and Oyster Patent Tong Budget Data

Alternative Wage Cost = $7800.00 (130 days * $60.00/day)

Annual Vessel Cost * = Dockage ($10.00) + Maintenance ($1880.67) + Taxes ($56.8)

Purchase Price of the Vessel (Engine Included) * = $2840.00

Vessel Ownership Cost = $284.00

Firm Overhead = Accounting ($100.00) + Transportation ($273) + Other Costs ($100)

Enterprise Data - Oyster Hand Tong

	Fall	Winter
Price/Bushel	11.98	11.85
# Hand Tongs Fished/Day	1.0	1.0
# Days Fished/Wk.	2.5	2.5
# Weeks/Season	10.0	10.0
Catch Per Hand Tong *	16.61	20.0
Cost Of A Hand Tong	60.0	60.0
Life Of Tong/Seasons	6.0	6.0
Fuel Use Per Day *	6.33	6.33
Vessel Use/Season/Days	25.0	25.0
Price Of Fuel	1.10	1.10
Labor Cost/Wk. *	66.66	66.66
Labor Weeks/Season	10.0	10.00
Other- Gloves/Day	1.0	1.0

Table 40 Cont'd: Oyster Patent Tong Enterprise Data

	Fall	Winter
Price/Bushel	11.98	11.85
# Patent Tongs Fished/Day	1.0	1.0
# Days Fished/Wk *	2.5	2.5
# Weeks/Season	10.0	10.0
Catch Per Patent Tong (Bu) *	22.67	22.67
Cost Of A Patent Tong	450.0	450.0
Life Of A Tong/ Seasons	30.0	30.0
Fuel Use Per Day *	11.66	11.66
Vessel Use/Season/Days	25.0	25.0
Price Of Fuel	1.10	1.10
Labor Cost/Wk. *	22.16	22.16
Labor Weeks/Season	10.0	10.0
Other- gloves/Day	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price and cost for goloves per day were develped from secondary sources.

Table 41: Oyster Hand Tong and Seed Oyster Budget Data

Alternative Wage Cost = $7800 (130 days * $60.00/day)

Annual Vessel Cost * = Dockage ($65.0) + Maintenance ($1242.83) + Taxes ($28)

Purchase Price of the Vessel (Engine Included) * = $1400

Vessel Ownership Cost = $140.00

Firm Overhead = Accounting ($100) + Transportation ($327.6) + Other Costs ($100)

Enterprise Data - Oyster Hand Tong

	Fall	Winter
Price/Bushel	11.98	11.85
# Hand Tongs Fished/Day	1.0	1.0
# Days Fished/Wk. *	2.5	2.5
# Weeks/Season	10.0	10.0
Catch Per Hand Tong (Bu) *	21.66	20.0
Cost Of A Hand Tong	60.0	60.0
Life Of Hand Tong/Seasons	6.0	6.0
Fuel Use Per Day *	10.0	10.0
Vessel Use/Season/Days	25.0	25.0
Price Of Fuel	1.10	1.10
Labor Cost/Wk. *	75.0	75.0
Labor Weeks/Season	22.5	22.5
Other- Gloves/Day	1.0	1.0

Table 41 Cont'd: Seed Oyster Enterprise Data

	Fall	Winter
Price/Bushel	2.51	2.83
# Patent Tongs Fished/Day	1.0	1.0
# Days Fished/Wk.	3.0	3.0
# Weeks Per Season	10.0	10.0
Catch Per Patent Tong (Bu) *	120.0	120.0
Cost Of A Patent Tong	450.0	450.0
Life Of Patent Tong/Seasons	30.0	30.0
Fuel Use Per Day *	11.5	11.5
Vessel Use/Season/Days	30.0	30.0
Price Of Fuel	1.10	1.10
Labor Cost/Wk. *	75.0	75.0
Labor Weeks/Season	17.5	17.5
Other- Gloves/Day	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price and cost for gloves per day were developed from secondary sources.

Table 42: Crab Pot, Oyster Hand Tong, Oyster Patent Tong
Budget Data

Alternative Wage Cost = $15600 (260 days * $60.00/day)

Annual Vessel Cost * = Dockage ($116.66) + Insurance ($121.33)
+ Maintenance ($2499.99) + Taxes ($346.66)

Purchase Price of the Vessel (Engine Included) * = $17333.33

Vessel Ownership Cost = $1733.33

Firm Overhead = Accounting ($100) + Transportation ($892.5)
+ Other Costs ($100)

Enterprise Data - Crab Pot

	Spring	Summer	Fall
Price/Bushel	10.24	7.24	8.54
# Pots Fished/Day *	337.0	287.0	262.0
# Days Fished/Wk *	6.0	6.0	6.0
# Weeks/Season	8.0	13.0	4.0
Catch Per Pot (Bu) *	.013	.095	.133
Cost Of A Pot	17.0	17.0	17.0
Life Of A Pot/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	3.83	3.83	3.83
Hours Fished Per Day *	10.0	9.75	9.25
Price Of Fuel	1.10	1.10	1.10
Labor Cost/Wk *	100.0	100.0	100.0
Labor Weeks/Season	8.0	13.0	4.0
Bait Cost Per Pound	.10	.10	.10
Bait Per Pot (Pounds) *	.4945	.7259	.7554
Other- Gloves/Day	1.0	1.0	1.0

Table 42 Cont'd: Oyster Hand Tong Enterprise Data

	Fall	Winter
Price/ Bushel	11.98	11.85
# Hand Tongs Fished/Day	1.0	1.0
# Days Fished/Wk.	2.5	2.5
# Weeks/Season	6.0	10.0
Catch Per Hand Tong (Bu) *	12.83	12.5
Cost Of A Hand Tong	60.0	60.0
Life Of A Hand Tong/Seasons	6.0	6.0
Fuel Use Per Day *	14.0	14.0
Vessel Use/Season/Days	15.0	25.0
Price Of Fuel	1.10	1.10
Labor Cost/Wk. *	81.66	81.66
Labor Weeks/Season	4.0	5.0
Other- Gloves/Day	1.0	1.0

Table 42 Cont'd: Oyster Patent Tong Enterprise Data

	Fall	Winter
Price/Bushel	11.98	11.85
# Patent Tongs Fished/Day	1.0	1.0
# Days Fished/Wk.	2.5	2.5
# Weeks/Season	6.0	10.0
Catch Per Patent Tong *	10.0	10.0
Cost Of A Patent Tong	450.0	450.0
Life Of A Patent Tong/Seasons	30.0	30.0
Fuel Use Per Day *	14.0	14.0
Vessel Use/Season/Days	15.0	25.0
Price Of Fuel	1.1	1.1
Labor Cost/Wk. *	81.66	81.66
Labor Weeks/Season	4.0	5.0
Other- Gloves/Day	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price, bait cost and cost for gloves per day were developed from secondary sources.

Table 43: Crab Pot, Oyster Patent Tong, Gill Net Budget Data

Alternative Wage Cost = $15600 (260 days * $60.00/day)

Annual Vessel Cost * = Dockage ($24.00) + Maintenance ($994.16) + Taxes ($177.63)

Purchases Price of the Vessel (Engine Included) * = 8881.66

Vessel Ownership Cost = $888.16

Firm Overhead = Accounting ($100) + Transportation ($827.4) + Other Costs ($100)

Enterprise Data - Crab Pot

	Spring	Summer	Fall
Price/Bushel	10.24	7.24	8.54
# Pots Fished/Day *	200.00	200.00	200.00
# Days Fished/Wk. *	5.50	6.00	5.50
# Weeks Per Season	8.00	13.00	4.00
Catch Per Pot (Bu) *	.055	.065	.0625
Cost Of A Pot	17.00	17.00	17.00
Life Of A Pot/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	2.75	2.75	2.75
Hours Fished Per Day *	6.50	7.0	7.0
Price Of Fuel	1.1	1.1	1.1
Bait Cost Per Pound	.1	.1	.1
Bait Per Pot (Pounds) *	.339	.625	.339
Other- Gloves/Day	1.0	1.0	1.0

Table 43 Cont'd: Oyster Patent Tong Enterprise Data

	Fall	Winter
Price/Bushel	11.98	11.85
# Patent Tongs Fished	1.0	1.0
# Days Fished/Wk. *	3.0	3.0
# Weeks Per Season	6.0	10.0
Catch Per Patent Tong (Bu) *	11.0	11.0
Cost Of A Patent Tong	450.0	450.0
Life Of A Patent Tong/Seasons	30.0	30.0
Fuel Use Per Day *	13.0	13.0
Vessel Use/Season/Days	18.0	30.0
Price Of Fuel	1.1	1.1
Labor Cost/Wk. *	75.00	75.00
Labor Weeks/Season	3.0	5.0
Other- Gloves/Day	1.0	1.0

Table 43 Cont'd: Gill Net Enterprise Data

	Spring	Summer	Fall
Price Per Pound:			
Bluefish	.163	.176	.17
Trout	.577	.506	.448
Croaker	.277	.31	.304
Spot	.26	.329	.503
# Nets Fished/Day *	4.0	4.0	4.0
# Days Fished/Wk. *	6.5	6.5	6.5
# Weeks Per Season	4.0	13.0	8.0
Catch Per Gill Net(lbs)*			
Bluefish	4.922	4.922	4.922
Trout	9.405	9.405	9.405
Croaker	2.012	2.012	2.012
Spot	3.357	3.357	3.357
Cost Of A Gill Net *	371.0	371.0	371.0
Life Of A Net/Seasons	4.0	4.0	4.0
Fuel Use Per Hour *	2.75	2.75	2.75
Hours Fished Per Day *	2.875	2.875	2.875
Price Of Fuel	1.1	1.1	1.1
Other- Gloves/Day	1.0	1.0	1.0

NOTE: Items marked by an * were mean values from the survey respondents who used this gear combination. All price data were for the 1986 calendar year as reported by the Virginia Marine Resources Commission. Weeks fished per season, gear costs, life of gear, fuel price, bait cost and cost for gloves per day were developed from secondary sources.

Table 44: Results

Single Gear Budgets

Crab Pot		
Enterprise Net Returns	=	2151.56
Enterprise Net Returns/week	=	86.06
Returns to Vessel, Overhead and Management	=	2151.56
Returns to Management	=	1343.39
Firm Cost	=	808.17
Rate of Return on Vessel	=	.3888
Oyster Patent Tong		
Enterprise Net Returns	=	8284.27
Enterprise Net Returns/week	=	517.76
Returns to Vessel, Overhead and Management	=	8284.27
Returns to Management	=	5049.26
Firm Cost	=	3168.32
Rate of Return on Vessel	=	-.6444
Clam Patent Tong		
Enterprise Net Returns	=	27721.78
Enterprise Net Returns/week	=	866.30
Returns to Vessel, Overhead and Management	=	27721.78
Returns to Management	=	20700.92
Firm Cost	=	7020.86
Rate of Return on Vessel	=	2.5066

Table 45: Results

Two Gear Budgets

Crab Pot and Oyster Hand Tong		
Enterprise Net Returns Crab Pot	=	7598.97
Enterprise Net Returns Oyster Hand Tongs	=	2871.48
Enterprise Net Returns Crab Pot/week	=	303.95
Enterprise Net Returns Oyster Hand Tongs/wk	=	179.46
Returns to Vessel, Overhead and Management	=	10470.46
Returns to Management	=	8231.07
Firm Cost	=	2239.38
Rate of Return on Vessel	=	-1.5362
Crab Pot and Oyster patent Tong		
Enterprise Net Returns Crab Pot	=	16566.07
Enterprise Net Returns Oyster Patent Tongs	=	6996.04
Enterprise Net Returns Crab Pot/week	=	662.64
Enterprise Net Returns Oyster Patent Tongs/wk	=	437.25
Returns to Vessel, Overhead and Management	=	23562.11
Returns to Management	=	20038.10
Firm Cost	=	3524.01
Rate of Return on Vessel	=	.3185
Crab and Gill Net		
Enterprise Net Returns Crab Pot	=	2604.09
Enterprise Net Returns Gill Net	=	-1181.00
Enterprise Net Returns Crab Pot/week	=	89.79
Enterprise Net Returns Gill Net/week	=	-47.24
Returns to Vessel, Overhead and Management	=	1423.09
Returns to Management	=	-346.28
Firm Cost	=	1769.37
Rate of Return on Vessel	=	-3.220
Oyster Hand Tong and Oyster Patent Tong		
Enterprise Net Returns Oyster Hand Tongs	=	9105.84
Enterprise Net Returns Oyster Patent Tongs	=	12341.05
Enterprise Net Returns Oyster Hand Tongs/wk	=	455.29
Enterprise Net Returns Oyster Patent Tongs/wk	=	617.05
Returns to Vessel, Overhead and Management	=	21446.90
Returns to Management	=	19165.43
Firm Cost	=	2281.47
Rate of Return on Vessel	=	3.9019

Table 45 Cont'd:

Oyster Hand Tong and Seed Oyster

Enterprise Net Returns Oyster Hand Tongs	=	8374.67
Enterprise Net Returns Seed Oyster	=	15711.00
Enterprise Net Returns Oyster Hand Tongs/wk	=	418.73
Enterprise Net Returns Seed Oyster/week	=	785.55
Returns to Vessel, Overhead and Management	=	24085.67
Returns to Management	=	22559.84
Firm Cost	=	1525.83
Rate of Return on Vessel	=	10.4427

Table 46: Results

Three Gear Budgets

Crab Pot, Oyster Hand Tong, Oyster Patent Tong

Enterprise Net Returns Crab Pot	=	9215.56
Enterprise Net Returns Oyster Hand Tongs	=	4556.05
Enterprise Net Returns Oyster Patent Tongs	=	3339.37
Enterprise Net Returns Crab Pot/week	=	368.62
Enterprise Net Returns Oyster Hand Tongs/wk	=	284.75
Enterprise Net Returns Oyster Patent Tongs/wk	=	208.71
Returns to Vessel, Overhead and Management	=	17110.99
Returns to Management	=	12243.01
Firm Cost	=	4867.98
Rate of Return on Vessel	=	-.2936

Crab Pot, Oyster Patent Tong, Gill Net

Enterprise Net Returns Crab Pot	=	7546.89
Enterprise Net Returns Oyster Patent Tongs	=	4918.14
Enterprise Net Returns Gill Net	=	-1177.56
Enterprise Net Returns Crab Pot/week	=	301.87
Enterprise Net Returns Oyster Patent Tong/wk	=	307.38
Enterprise Net Returns Gill Net/week	=	-47.10
Returns to Vessel, Overhead and Management	=	11287.47
Returns to Management	=	9153.51
Firm Cost	=	2133.95
Rate of Return on Vessel	=	-.8258

SECTION V: DISCUSSION OF RESULTS AND RECOMMENDATIONS

As noted earlier the diversity of the survey respondents makes it inadviseable to draw any general conclusions about the financial condition of the fishery from these budget results. The primary value of the analytical package and the data collected to date is to allow the individual users to specify their own input data for cost specific analysis. The development of the report has provided clear direction for continuation of this effort. Recommendation for continued work follow.

Data Bases:

1. There should be additional survey work, perhaps conducted by face-to-face interviews rather than mail survey to expand the data base to at least include soft crab harvest and shedding and harvest of private oyster grounds.
2. The ammended data base should be condensed to include only those items relevant to budget analysis and data should by made suitable for statistical analysis using statistical packages for personal computers.
3. The data in hand represent a potentially rich analytical resource. Further refinements, and perhaps

more generalizeable knowledge, can be achieved by an extensive statistical analysis of the budget data to calculate generalized harvest and cost functions. One example here includes assessing how catch per crab pot might vary with number of pots fished, bait used per pot and region of the Bay. Another example would by how fuel use varies with vessel size and engine horsepower. To the extent generalized harvest and cost functions can be developed the capability of the model to predict the effects of regulation on firm income and assess changes in number and extensiveness of enterprise employment on income will be enhanced.

Budget Analysis:

1. The budgets analysis might be improved by limiting the analysis to those who earn all their income from fishing. To the extent that some of the sample budgets include muliple gears and require five days per week on the water they would be expected to represent "full time" watermen.

2. The spread sheet might be modified to include income tax considerations so that after tax economic performance measures would be calculated. If such modification were done it may be necessary to write a specialized program rather than using existing

software. If this did occur consideration should be given to increasing the user-interactive features of the program and directly interfacing the data base with the budget analyzer.

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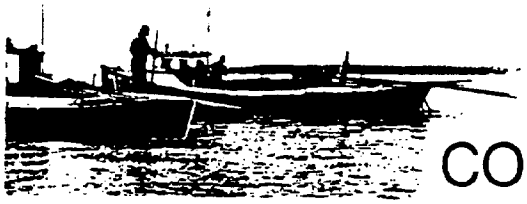
Marine Resources Commission. Laws Of Virginia Relating To The Marine Resources Of The Commonwealth. Newport News, Virginia. p.22. 1984.

Appendix A
The Survey



1st ANNUAL COMMERCIAL FISHERIES SURVEY

Virginia Institute of Marine Science
The College of William and Mary
Gloucester Point, Virginia 23062

March 20, 1986

Dear Commercial Fisherman:

Enclosed please find a copy of our Virginia commercial fisheries survey form. This form is being distributed to a select few; therefore, we encourage you to take the time to complete it and return it to us. This survey effort will be successful only if we are able to get a representative sample of commercial fishermen operating in Virginia's waters.

The Marine Advisory Services Program at the Virginia Institute of Marine Science provides numerous services to members of the Commonwealth's seafood industry. Members of our staff are available to assist commercial watermen as they evaluate new business opportunities, consider changing fisheries, or purchase new gear and equipment. We would like to have more information regarding specific fisheries to ensure that we are providing the most up-to-date information for our clients. We are enlisting your cooperation in this effort.

In addition to providing individual assistance to watermen, we are often requested to provide information to state regulatory agencies to ensure that proposed fisheries management plans will not adversely affect Virginia fishermen. The establishment of a formal fisheries management program requires that VMRC consider many factors in developing and implementing their management plans. We need to improve our information systems to ensure that watermen's needs are adequately addressed in the development of these plans; therefore, we encourage you to answer each question to the best of your ability. Please feel free to give your best estimate when the information is not readily available.

All information gathered from this survey will be held in strictest confidence. Your survey is numbered for recordkeeping purposes only. We believe that this survey effort can have a significant influence on the future of Virginia's bay fisheries. We are sure that you will want to take part in this effort, and are providing a phone number to answer any questions you may have. For further information, please call Ron Grulich, Marine Business Specialist, at (804) 642-7167. Thank you for your time and we look forward to your response to the questionaire.

Sincerely,

Ron Grulich
Marine Business Specialist

A Cooperative Effort of Virginia Institute of Marine Science and Virginia Tech

COMMERCIAL WATERMAN'S SURVEY

1. How old are you?_____

2. How long have you fished commercially?_____

3. Please indicate which licenses you held in 1985?
   a. Crab Pot _____
   b. Crab Dredge _____
   c. Oyster _____
   d. Clam _____
   e. Pound Net _____
   f. Other (please specify) _____

4. In which county do you live? _____

5. What percentage of your 1985 income did you earn from commercial fishing?_____

6. Vessel information for primary craft

   A. Construction Material: (Please Check)

      1. Steel _____
      2. Wood _____
      3. Fiberglass _____
      4. Aluminum _____

   B. Length _____ ft.

   C. Weight _____ years

   D. Age of vessel _____ years

   Engine Information

   a. Inboard_____ or Outboard _____ (Please Check)
   b. Horsepower _____ H.P.
   c. Fuel Type Gas_____ or Diesel_____(Please Check)
   d. Age of Engine _____
   e. Fuel Usage Per Hour_____gallons

8. In which county is the vessel docked for the majority of the year?_____

9. How much did you pay to dock your vessel in 1985?_____

10. Estimate your total cost for maintenance and repair during

the past three seasons. Include such costs as railway costs paint hull repair, engine repair, parts, electronics, etc.

a. 1983 $ _____
b. 1984 $ _____
c. 1985 $ _____

11. When did you obtain your primary fishing vessel?_____

12. Did you purchase your vessel? Yes___ No___

13. Was the vessel purchased new or used?
new_____ or used_____

14 How much did you pay for your vessel?_____
(Skip to question 16)

15. If you did not purchase your vessel, please indicate how it was obtained. (Check the appropriate method)

a. Inherited _____
b. Gift _____
c. Leased _____
d. Owned by an outside investor _____

16. Did you purchase your engine separately from your vessel?

Yes_____ No _____
(If no, skip to question 20)

17. When was the engine purchased? _____

18. Was it purchased new_____ or used _____?

19. How much did you pay for the engine?_____

20. What percentage of the original purchase price was financed with a bank?

A. Vessel an Engine_____
B. If purchased separately, Vessel_____% Engine_____%

21. How much did you pay to insure your vessel and crew in 1985?
_____

22. Was this figure higher than in 1984? Yes_____ No_____

23. Do you expect it to be higher in 1986? Yes_____ No_____

POUND NET AND GILL NET FISHERMAN

1. Please indicate which gears you fished in 1985: (Please Check)

   A. Pound Net _____
   B. Staked Gill Net _____
   C. Drift Gill Net _____
   D. Both _____

2. How many of each of these nets did you deploy in 1985?

   A. Pound Nets_____ B. Staked_____ C. Drift _____

3. On average, how many pounds of finfish did you catch each day using:

   A. Pound Nets _____ B. Staked _____ C. Drift _____

4. Please indicate the approximate percentage of each of the following species in your daily harvest.

Pound Nets	Gill Nets
A. Croaker_____	A. Croaker _____
B. Spot _____	B. Spot _____
C. Bunker _____	C. Bunker _____
D. Trout _____	D. Trout _____
E. Stripers _____	E. Stripers _____
F. Bluefish _____	F. Bluefish _____

5. What length of nets do you fish?

   A. Pound Nets_____ft.
   B. Staked Gill Nets_____ft.
   C. Drift Gill Nets_____ft.

6. On average, how much does it cost to buy the materials to construct and install a new:

   A. Pound Net $_____
   B. Staked Gill Net $_____
   C. Drift Gill Net $_____

7. How much does it cost to maintain your nets each year?

   A. Pound Net $_____
   B. Staked Gill Net $_____
   C. Drift Gill Net $_____

8. Number of Crew:

   A. Pound Net $_____
   B. Staked Gill Net $_____
   C. Drift Gill Net $ _____

9. Was the crew paid by wage_____ or share_____?

10. Average weekly wage or crew share percentage.

   A. Weekly wage $_____
   B. Crew share _____%

11. On average, how many hours does it take to run your nets each day?

   A. Pound Nets _____
   B. Staked Gill Nets _____
   C. Drift Gill Nets _____

12. Location where you harvest the majority of your catch?

   A. Pound Nets _____
   B. Staked Gill Nets _____
   C. Drift Gill Nets _____

13. Location where you sell the majority of your catch?

   A. Pound Nets _____
   B. Staked Gill Nets _____
   C. Drift Gill Nets _____

14. What percentage of your daily catch did you sell to:

A. Fish House	B. Restaurants	C. Food Stores
1. 100%_____	1. 100%_____	1. 100%_____
2. 75%_____	2. 75%_____	2. 75%_____
3. 50%_____	3. 50%_____	3. 50%_____
4. 25%_____	4. 25%_____	4. 25%_____
5. 0%_____	5. 0%_____	5. 0%_____

15. How many days per week do you work your:

A. Pound Nets_____
B. Staked Gill Nets_____
C. Drift Gill Nets_____

OYSTERS BY HAND TONGS

1. Average number of days fished per week for market oysters:

   a. Fall (October-November)_____
   b. Winter (December-February)_____
   c. Spring (April-May)_____

2. Location of market oyster grounds (water body).

   a. Fall (October-November)_____
   b. Winter (December-February)_____
   c. Spring (April-May) _____

3. Number of crew

   a. Fall_____
   b. Winter_____
   c. Spring_____

4. Was the crew paid by wage or share?

   a. Wage_____
   b. Share_____

5. Average weekly wage per crew member $_____ or crew share percentage_____%

6. Average harvest per day in bushels.

   a. Fall _____ bu.
   b. Winter _____ bu.
   c. Spring _____ bu.

7. Location where catch is sold (town)._____

8. Percentage of catch sold to:

Buyers		Shucking House	
1.	100%_____	1.	100%_____
2.	75%_____	2.	75%_____
3.	50%_____	3.	50%_____
4.	25%_____	4.	25%_____
5.	0%_____	5.	0%_____

9. On average, how many gallons of fuel do you burn each day?_____

OYSTER BY PATENT TONGS AND DREDGE

1. Do you fish for oysters using:

   a. Patent Tongs_____ b. Dredge_____ c. Both _____

2. If you use patent tongs do you use a single rig or double rig?_____

3. What percentage of your oyster fishing income results from:

Patent Tonging	Dredging
1. 100%_____	1. 100%_____
2. 75%_____	2. 75%_____
3. 50%_____	3. 50%_____
4. 25%_____	4. 25%_____
5. 0%_____	5. 0%_____

4. On average, how many days per week do you:

   a. Patent Tong_____ b. Dredge_____

5. Location of your primary harvesting grounds (water body).

   a. Patent Tong_____ b. Dredge_____

6. Number of crew

   a. Patent Tong_____ b. Dredge_____

7. Was the crew paid by wage or share? wage_____ share_____

8. Average weekly wage per crew member $_____ or share_____%

9. Average harvest per day in bushels:

   a. Patent Tonging_____ b. Dredge_____

10. Location where you sell your catch (town)?

    a. Patent Tong _____ b. Dredge_____

11. Please indicate the percentage of your catch sold to buyers or the shucking house.

Buyers		Shucking House	
1.	100%_____	1.	100%_____
2.	75%_____	2.	75%_____
3.	50%_____	3.	50%_____
4.	25%_____	4.	25%_____
5.	0%_____	5.	0%_____

12. On average, how many gallons of fuel do you burn on a normal work day?_____

13. What percentage of your catch was taken from each of the following areas:

Working grounds leased by others:		Working grounds planted by you:	
1.	100%_____	1.	100%_____
2.	75%_____	2.	75%_____
3.	50%_____	3.	50%_____
4.	25%_____	4.	25%_____
5.	0%_____	5.	0%_____

Public Grounds:

1. 100%_____
2. 75%_____
3. 50%_____
4. 25%_____
5. 0%_____

14. If you plant your own leased grounds please answer the following questions.

a. How many acres do you plant?_____
b. How many bushels do you plant per acre?_____
c. Where are you leased grounds located (water body)?_____
d. What is your best estimate of the yield of market oysters on your own ground per bushel of seek oysters planted?_____

CLAM HARVESTING BY PATENT TONGS

1. Number of days fished per week:

   a. Fall (October-November)_____
   b. Winter (December-February)_____
   c. Spring (March-May)_____
   d. Summer (June-September)_____

2. Location of clam grounds (water body):

   a. Fall_____
   b. Winter_____
   c. Spring_____
   d. Summer_____

3. Number of crew:

   a. Fall_____
   b. Winter_____
   c. Spring_____
   d. Summer_____

4. Was the crew paid by wage or share?

   wage_____ share_____

5. Average weekly wage or crew share percentage?

   a. Weekly wage $_____
   b. Crew share _____%

6. Average harvest per day in bushels:

   a. Fall_____bu.
   b. Winter_____bu.
   c. Spring_____bu.
   d. Summer_____bu.

7. Location where catch is sold (town)._____

8. Percentage of catch sold to:

Buyers	Shucking House	Restaurants
1. 100%_____	1. 100%_____	1. 100%_____
2. 75%_____	2. 75%_____	2. 75%_____
3. 50%_____	3. 50%_____	3. 50%_____
4. 25%_____	4. 25%_____	4. 25%_____
5. 0%_____	5. 0%_____	5. 0%_____

9. What percentage of your daily catch would qualify as:

a. Chowders_____%
b. Cherries_____%
c. Necks_____%

10. How many gallons of fuel do you burn each day during:

a. Fall_____gallons
b. Winter_____gallons
c. Spring_____gallons
d. Summer_____gallons

11. Do you participate in the summer polluted clam fishery?

Yes_____ No_____

12. What percentage of your clam fishing income comes frome the polluted clam fishery?_____

CRAB POTTING

1. Number of pots fished per day.

   a. Spring (April-May)_____
   b. Summer (June-August)_____
   c. Fall (September-October) _____

2. Average number of bushels caught per day.

   a. Spring_____
   b. Summer_____
   c. Fall_____

3. What percentage of your pots do you purchase from others each year?

   a. All_____
   b. 75%_____
   c. 50%_____
   d. 25%_____
   e. None_____

4. How many days do you fish per week during the following seasons:

   a. Spring_____
   b. Summer_____
   c. Fall_____

5. Location of crabbing grounds (water body).

   a._____
   b._____

6. Location where catch sold (town).

   a._____
   b._____

7. What percentage of your catch do you sell to a picking house?

   a. 100%_____
   b. 75%_____
   c. 50%_____
   d. 25%_____
   e. 0%_____

8. How many hours does it take to make your daily run?

   a. Spring_____
   b. Summer_____
   c. Fall_____

9. How much bait do you use per week?
   a. Spring_____
   b. Summer_____
   c. Fall_____

10. Do you hire extra crew to help run the boat? Yes____ No_____
    If no, disregard the following questions.

11. Crew number

    a. Spring_____
    b. Summer_____
    c. Fall_____

12. Was the crew paid by wage or share?

    a. Wage 1st crewman $_____ per week.
       2nd crewman $_____ per week.
    b. Crew share 1st crewman_____%
       2nd crewman_____%

SEED OYSTER HARVESTORS

1. Do you fish the James River seed beds during the October-July season?

   Yes_____ No_____

2. Do you fish other seed bed areas from October through June?

   Yes_____ No_____

3. If you fish other seed beds in addition to the James please indicate the percentage of your time spent on James Rivers and Non-James River seed beds:

   a. James River _____%
   b. Other Seed Areas _____%

4. How much of your oyser fishing income do you earn from selling seed oysters?

   a. 100%_____
   b. 75%_____
   c. 50%_____
   d. 25%_____
   e. 0%_____
   f. Other_____%

5. Number of crew:

   a. Fall_____
   b. Winter_____
   c. Spring_____

6. Was the crew paid by wage or share?

   a. wage_____ b. share_____

7. Average weekly wage per crew member $_____or crew share percentage_____%

8. Where do you sell your seed oysters (town or towns)?

   a. _____
   b. _____

9. How many bushels of seed oysters do you harvest each day?

   a. James River _____bu.

b. Other Seed Areas _____bu.

10. How many gallons of fuel do you burn each day?_____

11. How many days per week do you work?_____

APPENDIX B
Using The Budgeting Program

Introduction:

Measures of economic performance which are relevant to Virginia fisheries have been discussed in some detail within this paper. A template for the "Supercal-3" spreadsheet program has been developed, which will permits calculation of these performance measures based upon defined firm characteristics and financial information. The following discussion will describe in detail the format of the spreadsheet and its application. It will be assumed that the reader is familiar with the Supercalc-3 software package.

Description of the Spreadsheet Format:

Table A-1 is a depiction of the general format of the spreadsheet program. The spread sheet is partitioned into six separate sections and structured in such a way that modifications may be made with little difficulty. Section one is the main menu; it utilizes the first 24 rows and columns A through D. Section two is the vessel cost budget; it utilizes rows 1 through 23 and columns G through J. Section three is the overhead cost budget; it utilizes rows 70 through 79 and columns A through E. Section four is the set of individual enterprise budgets by gear type; it utilizes rows 50 through 138 and columns Q through BH. Section five is the set of formulas associated with the enterprise

budgets; it utilizes rows 150 through 212 and columns Q through BK. Section six is the set of economic performance measures derived from the enterprise budgets; it utilizes rows 34 through 57 and columns A through D. The order in which these sections are specified will become more important as the user works through the spreadsheet.

Description of the Spreadsheet by Section:

A. Main Menu:

The main menu will appear on the screen initially, after Supercalc-3 is initialized (see Table A-2). The menu contains the tables of contents for the enterprise budgets. The budget title is listed in column A and the address of the budget is specified in column E. There is a set of zeros in column C of the enterprise section of the menu; The user will use this column to specify the relevant gear types for the analysis (by replacing the zeros with ones). The user will specify an alternative income figure in cell C5. It may be useful to develop the complete enterprise budget information before completing this section.

The vessel budget consists of a list of vessel characteristics and annual cost items. The economic performance measures will not be functions of the vessel characteristics; the user may choose to list the vessel characteristics in the budget as a reference. Default cost values have been established

in cells I14 through I20, based upon the survey analysis. The cost for maintenance and repair is based upon a three year average and the current market value of the vessel includes the value of the engine. The user may change these values if they are not consistent with his expectations. Since vessel costs are not enterprise specific, the vessel budget is kept separate from the individual enterprise budgets. Table A-3 is the vessel cost menu as it appears in the spread sheet.

C. Overhead Cost Budget:

Accounting and Seasonal Transportation Costs are summarized in the overhead budget. The default values for these cost items are specified in cells B71 through E77. The value for transportation cost was based upon an average cost of twenty-one cents per mile (Twenty miles from home) and the number of days fished per season. Other costs may also be included. Table A-4 is the firm overhead menu as it appears in the spreadsheet.

D. Enterprise Budgets:

The enterprise budget section is divided into two subsections; the first subsection consists of enterprise budgets for crab potting, crab dredging, crab scraping, crab trapping, oyster dredging, oyster harvesting by hand tongs, oyster harvesting by patent tongs and seed oyster harvesting. The second subsection consists of enterprise budgets for pound netting, gill

netting, clam harvesting by patent tongs and peeler potting. Except for a few modifications, all of the individual enterprise budgets have the same format. A general budget has been used as an illustration in Table A-5. Within each budget, the revenue and cost items are broken down by season and default values for these items have been established in the right columns.

Notes with regard to enterprise budgets:

1) The number of days fished per season is equal to the number of days fished per week multiplied by the number of weeks fished per season.

2) The useful life of gear is expressed in terms of the number of seasons, not years. Values for gear cost (outlay) and useful life must be entered in every data column.

3) The value of labor weeks is equal to the crew number multiplied by the number of weeks fished per season. If the firm has two crew members during all seasons and the number of weeks fished per season is equal to ten, the user may enter 2*10 in each appropriate colunm adjacent to the label, "Number of labor weeks per season."

4) The user should recognize that crew members are paid by wage or by share. If crew mambers are paid by share, a value of zero should be entered in the columns adjacent to weekly wage.

5) Value added activities (ex. oyster shucking) can add costs. If these costs are incurred, the price received per unit of

processed product should be used as the product price.

E. Formulas:

This section of the spreadsheet is also broken down into two subsections. The first subsection is a set of revenue and cost calculations for the first subset of budgets in section four. The second subsection is a set of revenue and cost calculations for the second subset of budgets in section four. Within each subsection, there will be a list of abbreviations for the revenue and cost items in the left column and a set of calculations corresponding to those items in the right column. Abbreviations of the revenue and cost items are defined below.

GRF - Gross Revenue / Fall
FRW - Gross Revenue / Winter
GRSP - Gross Revenue / Spring
GRSM - Gross Revenue / Summer
GR - Annual Gross Revenue
ESVCF - Enterprise Specific Variable Costs / Fall
ESVCW - Enterprise Specific Variable Costs / Winter
ESVCSP - Enterprise Specific Variable Costs / Spring
ESVCSM - Enterprise Specific Variable Costs / Summer
ESFCF - Enterprise Specific Fixed Costs / Fall
ESFCW - Enterprise Specific Fixed Costs / Winter
ESFCSP - Enterprise Specific Fixed Costs / Spring

ESFCSM - Enterprise Specific Fixed Costs / Summer

TVC - Total Enterprise Specific Variable Cost

TFC - Total Enterprise Specific Fixed Costs

TC - Total Enterprise Costs

ENR - Annual Enterprise Net Returns

How To Access The Budget Spreadsheet Program:

Step One:

Insert the Supercalc-3 disc into the "A" drive and insert the spreadsheet program disc into the "B" drive.

Step Two:

After the Supercalc-3 program has been initialized and a blank spreadsheet appears on the screen, enter the command (press only the letters which are capitalized),

/L(oad),B:BUD then Press enter and press A(ll)

Slash L is the Load command; B:, signifies that the loadable file is in the "B" drive; the letters "BUD" represent the file name; A(ll) indicates that the entire spreadsheet is to be loaded, not only part of the spreadsheet. After the file "BUD" has been loaded, the main menu (section one of the spreadsheet) will appear on the screen (see figure two).

Application of the program:

The following is the step by step procedure for using the spreadsheet program.

Step One:

When the main menu appears on the screen, the user will enter a value for alternative annual wage in cell C5.

Step Two:

The user will access the vessel budget (section two) by using the goto command. The address of the vessel budget is specified as "G1" in cell C7. The user will enter =G1 on the command line at the bottom of the spreadsheet. When the vessel budget appears on the screen, the default values will be reviewed and any necessary changes to those values will be made.

Step Three:

The user will access the overhead budget (section three) by entering =A70 on the command line. When the overhead budget appears on the screen, the default values will be reviewed and any necessary changes to those values will be made.

Step Four:

The user will go back to the main menu by entering =A on the command line. The user will review the different gear types

listed in the menu and select the relevant gear types by entering a value of one in the cell adjacent to the gear type lable. For example, If the user is primarily interested in the economic performance of a firm that engages in clam and oyster harvesting with patent tongs, the user will enter a value of one in cells C13 and C16 only.

Step Five:

After the enterprises have been selected, the user will review the budget address specifications in column "E". The user will use the various goto commands in order to access the budgets of interest. For each relevant budget in section four, the user will review the default values and make any necessary changes to those values.

Step Six:

Each time the user reviews a particular budget and makes corrections to the default values, performance measures are to be calculated by pressing !. The user may either go to the corresponding revenue and cost calculations listed in section five (by using the goto command specified at the bottom of the budget) or to the general economic performance measures listed in section six (by using the command =A34).

Step Seven:

The user will analyze the economic performance measures of the firm. Step six may be repeated as many as eleven times depending on the number of enterprises that the use is interested in analyzing at one time.

Table A-1: Spreadsheet Layout

Main Menu	Vessel Cost Budget
Economic Performance Measures	
Overhead Budget	
	Enterprise Budgets
	Formulas-Revenue and Cost Information

Table A-2: Main Menu

	A	B	C	D	E
1	FINANCIAL ANALYSIS OF THE FISHERY - BY ENTERPRISE				
2					
3					
4					
5	ALTERNATIVE INCOME		0		
6					
7	VESSEL		GOTO G1		
8					
9	FIRM OVERHEAD		GOTO A70		
10					
11	ENTERPRISES				
12					
13	CLAM-PATENT TONGS		0	GOTO Q90	
14	OYSTER BY HAND TONGS		0	GOTO Q50	
15	OYSTER BY DREDGE		0	GOTO AC50	
16	OYSTER BY PATENT TONGS		0	GOTO W50	
17	SEED OYSTER HARVESTER		0	GOTO AI50	
18	CRAB POT		0	GOTO AO50	
19	CRAB DREDGE		0	GOTO AU50	
20	CRAB SCRAPE		0	GOTO AZ50	
21	CRAB TRAP		0	GOTO BE50	
22	POUND NET		0	GOTO AC90	
23	GILL NET		0	GOTO AO90	
24	PEELER POT		0	GOTO AZ90	

Table A-3: Vessel Menu

	G	H	I	J
1	VESSEL			
2				
3	CHARACTERISTICS OF THE VESSEL			
4				
5	BOAT MATERIAL		WOOD	
6	LENGTH OF THE VESSEL		18	
7	WEIGHT OF THE VESSEL		5	
8	AGE OF THE VESSEL		10	
9				
10	FUEL USE PER HOUR (GAL)		2	
11				
12	ANNUAL COSTS:			
13				
14	COST FOR INSURANCE		188	
15	COST FOR MAINTENANCE AND REPAIR		1037.33	
16	COST FOR TAXES		100	
17	COST FOR ADMINSTRATIVE AND LEGAL		50	
18	CURRENT MARKET VALUE OF THE VESSEL		3860	
19	CURRENT INTEREST RATE CHARGE		.10	
20	OTHER COSTS		0	
21				
22		1375.33		
23	ANNUAL VESSEL COST	1761.33		

Table A-4: Overhead Cost Menu

	:	B	:	C	:	D	:	E
70	ANNUAL OVERHEAD COSTS:	AMOUNT						
71	ACCOUNTING	100						
72	OTHER 1	67						
73	OTHER 2	0						
74	QUARTERLY OVERHEAD:	FALL		WINTER		SPRING		SUMMER
75	TRANSPORTATION TO DOCK	218.4		218.4		218.4		218.4
76	OTHER 1	0		0		0		0
77	OTHER 2	0		0		0		0
78		167						
79	TOTAL OVERHEAD COSTS:	1040.6						

Table A-5: Enterprise Budget

	: AO	: AP	: AQ	: AR
50	ENTERPRISE:		SEASON	
51		SPRING	SUMMER	FALL
52	SEASONAL PRICE/UNIT			
53	GEAR UNIT COST			
54	NUMBER OF GEAR USED			
55	CATCH PER GEAR UNIT PER DAY			
56	DAYS FISHED PER SEASON			
57				
58				
59				
60	USEFUL LIFE FOR EACH GEAR (SEASON)			
61				
62	HIRED LABOR:			
63				
64	DOLLAR WAGE RATE PER WEEK			
65	LABOR WEEKS FOR THE FIRM			
66	PERCENT WAGE SHARE			
67				
68	FUEL:			
69				
70	FUEL USE PER HOUR			
71	NUMBER OF RUNNING HOURS PER DAY			
72	FUEL PRICE			
73				
74	MISCELLANEOUS:			
75				
76	GEAR MAINTENANCE			
77	PRICE OF BAIT PER POUND			
78	BAIT PER GEAR UNIT (POUNDS)			
79	DAILY COST FOR GLOVES			
80	OTHER DAILY COST			
81				
82	VALUE ADDED ACTIVITIES			
83	LABOR COSTS/UNIT			
84	MATERIAL COSTS/UNIT			
85	OTHER COSTS/UNIT