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## The Florida Commercial Blue Crab Industry: Landings, Prices and Resource Productivity

by Paul D. Landrum & Fred J. Prochaska

Report Number 34

August 1980



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and  
Fred J. Prochaska

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## TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES . . . . .	iv
LIST OF FIGURES . . . . .	v
INTRODUCTION . . . . .	1
Definitions . . . . .	2
Data Base . . . . .	2
Methodology . . . . .	3
LANDINGS, VALUES, AND PRICES . . . . .	4
Florida and the U.S. . . . .	4
Florida . . . . .	6
Landings by County and Coast . . . . .	10
Monthly Landings by Coast . . . . .	13
LABOR AND CAPITAL TRENDS . . . . .	18
Florida . . . . .	19
Fishermen . . . . .	19
Firms . . . . .	23
Traps . . . . .	23
East and West Coasts . . . . .	24
Fishermen . . . . .	24
Firms . . . . .	27
Traps . . . . .	29
PRODUCTIVITY TRENDS . . . . .	30
Florida . . . . .	30
Volume and Value per Fisherman and Firm . . . . .	30
Volume and Value per Trap . . . . .	30
East and West Coasts . . . . .	35
Volume and Value per Fisherman and Firm . . . . .	35
Volume and Value per Trap . . . . .	39
SUMMARY . . . . .	45
REFERENCES . . . . .	47
APPENDIX . . . . .	48

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Total volume and value for Florida and U.S. blue crabs, 1952-77 . . . . .	5
2	Total volume and value for blue crabs, east and west coasts of Florida, 1952-77 . . . . .	7
3	Blue crab landings for major Florida crab producing counties, 1952-63 and 1964-77 averages . . . . .	12
4	Blue crab monthly landings with five-year average monthly landings, Florida east coast, 1962-76 . . .	16
5	Blue crab monthly landings with five-year average monthly landings, Florida west coast, 1962-76 . . .	17
6	Blue crab physical capital and labor inputs, Florida, 1952-77 . . . . .	22
7	Blue crab capital and labor inputs, Florida east and west coasts, 1952-1976 . . . . .	26
8	Total volume and value of blue crabs landed per firm, per trap, and per fisherman, 1952-77 . . . . .	32
9	Total volume and value of blue crabs landed per firm, per trap, and per fisherman, Florida east and west coasts, 1952-76 . . . . .	37

LIST OF APPENDIX TABLES

1	Regression equations and summary of results . . . . .	49
2	Total volume and value of blue crabs landed in traps and as residual catch, Florida east and west coasts, 1952-74 . . . . .	50

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Total U.S. and Florida landings of blue crabs, 1952-77 . . . . .	6
2	Total trap (or pot) and residual Florida blue crab landings, 1952-77 . . . . .	8
3	Total volume and value of blue crabs landed with traps in Florida, 1952-77 . . . . .	9
4	Average volume of Florida blue crabs landed by county, 1974-76 . . . . .	11
5	Total volume of blue crab landed with traps in Florida's east and west coasts, 1952-76 . . . . .	14
6	Total value of blue crab landed with traps on Florida's east and west coasts, 1952-76 . . . . .	14
7	Florida east and west coast blue crab prices, 1952-76 . . . . .	15
8	Florida east coast five-year monthly averages, blue crab landings, 1962-76 . . . . .	19
9	Florida west coast five-year monthly averages, blue crab landings, 1962-76 . . . . .	19
10	Blue crab fishermen in Florida, 1952-77 . . . . .	21
11	Regular and casual blue crab fishermen in Florida, 1952-74 . . . . .	21
12	Blue crab firms in Florida, 1952-77 . . . . .	24
13	Blue crab traps fished in Florida, 1952-77 . . . . .	25
14	Blue crab fishermen in the Florida east and west coasts, 1952-76 . . . . .	28
15	Blue crab firms in the Florida east and west coasts, 1952-76 . . . . .	28
16	Blue crab traps fished in the Florida east and west coasts, 1952-76 . . . . .	29

LIST OF FIGURES--Continued

<u>Figure</u>		<u>Page</u>
17	Blue crabs landed per fisherman in Florida, 1952-77 . . . . .	31
18	Blue crabs landed per firm in Florida, 1952-77 . . .	31
19	Value of blue crabs landed per fisherman in Florida, 1952-77 . . . . .	33
20	Value of blue crabs landed per firm in Florida, 1952-77 . . . . .	33
21	Volume and value of blue crabs landed per trap in Florida, 1952-77 . . . . .	34
22	Volume of blue crabs landed per fisherman in the Florida east coast, 1952-76 . . . . .	36
23	Volume of blue crabs landed per firm on the Florida east coast, 1952-76 . . . . .	36
24	Volume of blue crabs landed per fisherman on the Florida west coast, 1952-76 . . . . .	38
25	Volume of blue crabs landed per firm on the Florida west coast, 1952-76 . . . . .	38
26	Value of blue crabs landed per fisherman on the Florida east coast, 1952-76 . . . . .	40
27	Value of blue crabs landed per firm on the Florida east coast, 1952-76 . . . . .	40
28	Value of blue crabs landed per fisherman on the Florida west coast, 1952-76 . . . . .	41
29	Value of blue crabs landed per firm on the Florida west coast, 1952-76 . . . . .	41
30	Volume of blue crabs landed per trap on the Florida east coast, 1952-76 . . . . .	42
31	Volume of blue crabs landed per trap on the Florida west coast, 1952-76 . . . . .	42
32	Value of blue crabs landed per trap on the Florida east coast, 1952-76 . . . . .	44
33	Value of blue crabs landed per trap on the Florida west coast, 1952-76 . . . . .	44

THE FLORIDA COMMERCIAL BLUE CRAB INDUSTRY:  
LANDINGS, PRICES AND RESOURCE PRODUCTIVITY

Paul D. Landrum  
and  
Fred J. Prochaska

INTRODUCTION

Florida's annual commercial hard blue crab landings averaged 16.7 million pounds with a dockside value of \$2.5 million from 1973 through 1977<sup>1</sup>. While total dockside value has increased over the past two and one-half decades, total landings have decreased since 1965. Industry members, researchers and governmental agencies have expressed concern over the decline in blue crab landings. Consequently, considerable biological and economic research has recently been initiated in the blue crab industry of Florida. The purpose of this report is to compile published statistics beginning with 1952, which was the first year there was a complete census of the industry, and to develop and analyze trends in landings, value and resources devoted to the fishery. Information of this type is of direct importance to fishermen and fish dealers for their production and marketing decision making. Support industries such as credit institutions and gear suppliers also have need for this information. In addition, the analysis will provide basic background data for state management personnel and other research projects concerned with the Florida blue crab fishery.

Data and analyses are presented for Florida, the Florida east and west coasts and county levels where appropriate. Only commercial landings are

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<sup>1</sup>All blue crab landings reported in this manuscript refer to hard blue crabs. Soft blue crabs are in total a small part of the Florida blue crab industry.



considered in this report. The report is presented in four sections. The first section is an analysis of trends in the volume and value of blue crab landings. Trends in resource inputs such as number of fishermen, fishing craft and gear employed are analyzed in section two. The third section combines the analysis of landings and resources utilization to determine productivity trends. The final section is the summary.

### Definitions

Boats are defined as craft having a carrying capacity of less than five net tons while vessels are defined as craft with a capacity greater than or equal to five net tons. Vessels are documented by the U.S. Coast Guard. Net tonnage is measured with respect to volume of carrying capacity and not the actual weight of the craft [4].

A firm is defined as a single operating unit including captain, crew and gear. The number of firms is estimated as the summation of the number of boats and vessels. No distinction between the size (net tonnage) of the craft is made by the term "firm." It is assumed that each firm has only one captain regardless of ownership. Almost all blue crabs in Florida are presently caught by very small boats using crab traps.

### Data Base

With a few exceptions, the data and computations presented in this publication are from the National Marine Fisheries Service (NMFS) and the Florida Department of Natural Resources (FDNR). NMFS data are published in a series of annual reports containing statistics and textual reviews on the commercial fisheries of the U.S. [4]. These published data are collected in cooperation with the various states and tabulated by the staff of the Statistics and Market News Division, National Marine Fisheries Service, U.S. Department of Commerce. Readers interested in the statistical procedure are referred to the section in each annual report entitled "Statistical Survey Procedure" where the survey procedure followed has been outlined in moderate detail to document the source of figures and methods for their collection [4]. FDNR data are also

published in a series of annual reports containing volume and value of seafood by species. These data are collected in cooperation with NMFS [1].

Data in the annuals are classified according to major fishery regions. Florida Fishery Statistics (NMFS) are separated into the South Atlantic fisheries (east coast) and the Gulf fisheries (west coast). Florida Landings (FDNR) are separated into the east and west coasts of Florida. In the text of this report "east coast" and "west coast" refer to these Florida fisheries and never refer to the coastal areas of the U.S. Some of the input data for the east and west coasts are not currently available beyond 1974.

### Methodology

Overall trends in the data were calculated to study long-term changes. This process results in a smoothing of the data in the sense that annual variations and short-term cycles are removed. This allows for analysis of the overall growth or decline of the industry. However, annual variations and shorter term cycles are also discussed in the text.

Trends in the data are determined by one of two methods; regression analysis using ordinary least squares or five-year moving averages. The method used in estimating the trends for each particular set of data is determined by how well the estimated equation fits the data. If the statistically predicted values or estimated trend fit the data poorly, the five-year moving average method was used. This average is determined by dividing the sum of the first five years of data by five, giving the first five-year moving average. For the next average, the first number of the data is dropped, and the next five numbers of the data set are added and then divided by five to get the second five-year moving average. This process was then continued through the time series of data.

All regression equations are presented in Appendix Table 1 and will be referenced by equation number only in the text. The five-year moving average is referenced as such in the text. For a detailed explanation of ordinary least squares regression analysis techniques, the reader is referred to J. Kmenta [2].

## LANDINGS, VALUES AND PRICES

Florida and the U.S.

Florida's percentage contribution to the total volume of hard blue crabs landed in the U.S. was relatively small during the 26-year period 1952-77. Florida landings ranged from a low of 8.2 percent of total U.S. volume in 1952 to a high of 18.2 percent in 1959 (Table 1, Figure 1). However, Florida ranked third among the 13 states reporting blue crab landings in 1975 [4]. Virginia and Maryland were the leading states in 1975 with each accounting for 19 percent of U.S. landings while Florida accounted for 13 percent. Florida's relative contribution was highest during the second half of the 1950 decade. The yearly volume of crabs follows basically the same cyclic pattern for both the U.S. and Florida production (Figure 1). Peaks in the crab production cycle occurred during 1960 and 1965, for both Florida and the U.S. and in 1970 and 1974 for Florida and 1971 and 1974 for the U.S. This five-year production cycle for both the U.S. and Florida tends to suggest that annual volume is heavily dependent on biological and environmental factors.

Blue crab value is based on the price per pound of live crabs at dockside for both Florida and the U.S. Prices were slightly higher for the U.S. in 17 of the 26 years investigated. During 1956, 1959, 1968, 1975, 1976 and 1977 U.S. prices exceeded Florida prices by more than one cent per pound with the greatest differences in 1968 and 1976. The U.S. price increased from 6.0 cents per pound in 1967 to 10.0 cents per pound in 1968, representing a 66.7 percent increase. In contrast, Florida showed only a 27.4 percent increase from 6.2 cents per pound in 1967 (which is relatively close to the U.S. figure) to 7.9 cents per pound in 1968. The largest yearly difference in price per pound occurred between 1975 and 1976. The price per pound increased 41.0 percent to 20.3 cents for the U.S. compared to a 28.2 percent increase to 16.8 cents for Florida (Table 1). Since 1971, U.S. prices have consistently exceeded Florida prices. These differences in prices have had a large effect on the overall value of crabs landed in Florida compared to the U.S. (Table 1). Prices in both Virginia and Maryland were higher than Florida prices in 1975. Virginia fishermen received 14.5 cents per pound and fishermen in

Table 1.--Total volume and value for Florida and U.S. blue crabs, 1952-77

Year	U.S.			Florida				
	1,000 pounds	1,000 dollars	cents/lb.	1,000 pounds	1,000 dollars	cents/lb.	Percent of U.S. pounds	Percent of U.S. dollars
1952	99,825	4,255	4.3	8,181	368	4.5	8.2	8.6
1953	105,385	4,792	4.5	9,561	446	4.7	9.1	9.3
1954	97,780	4,255	4.4	9,830	491	5.0	10.1	11.5
1955	97,654	5,163	5.3	12,637	632	5.0	13.0	12.2
1956	94,003	5,734	6.1	11,777	552	4.7	12.5	9.6
1957	107,978	6,232	5.8	11,834	618	5.2	11.0	9.9
1958	105,641	5,667	5.4	16,690	821	4.9	15.8	14.5
1959	112,531	6,942	6.2	20,508	1,018	5.0	18.2	14.7
1960	149,646	7,810	5.2	25,609	1,243	4.9	17.1	15.9
1961	147,652	6,737	4.6	24,615	1,081	4.4	16.7	16.0
1962	149,374	7,539	5.0	18,225	921	5.1	12.2	12.2
1963	141,743	7,719	5.4	21,744	1,138	5.2	15.3	14.7
1964	152,292	9,267	6.1	21,019	1,290	6.1	13.8	13.9
1965	166,996	11,236	6.7	26,561	1,595	6.0	16.0	14.2
1966	166,827	9,963	6.0	23,870	1,440	6.0	14.3	14.5
1967	145,027	8,603	6.0	23,296	1,451	6.2	16.1	16.9
1968	113,619	11,143	10.0	15,623	1,241	7.9	13.8	11.1
1969	132,255	12,459	9.4	17,308	1,631	9.4	13.1	13.1
1970	145,410	10,317	7.1	22,565	1,727	7.7	15.5	16.7
1971	149,081	12,921	8.7	21,411	1,690	7.9	14.4	13.1
1972	147,468	14,671	10.0	16,961	1,642	9.7	11.5	11.2
1973	136,516	17,661	13.0	13,512	1,679	12.4	9.9	9.5
1974	149,176	19,259	13.0	17,605	2,198	12.5	11.8	11.4
1975	130,816	18,793	14.4	16,992	2,222	13.1	13.0	11.8
1976	113,152	22,966	20.3	16,073	2,696	16.8	14.2	11.7
1977	128,860	27,454	21.3	19,256 <sup>a</sup>	3,897 <sup>a</sup>	20.2 <sup>a</sup>	14.9	14.2

<sup>a</sup> preliminary data provided by the National Marine Fisheries Statistics, Miami, Florida Laboratory.

Source: Derived from [4].

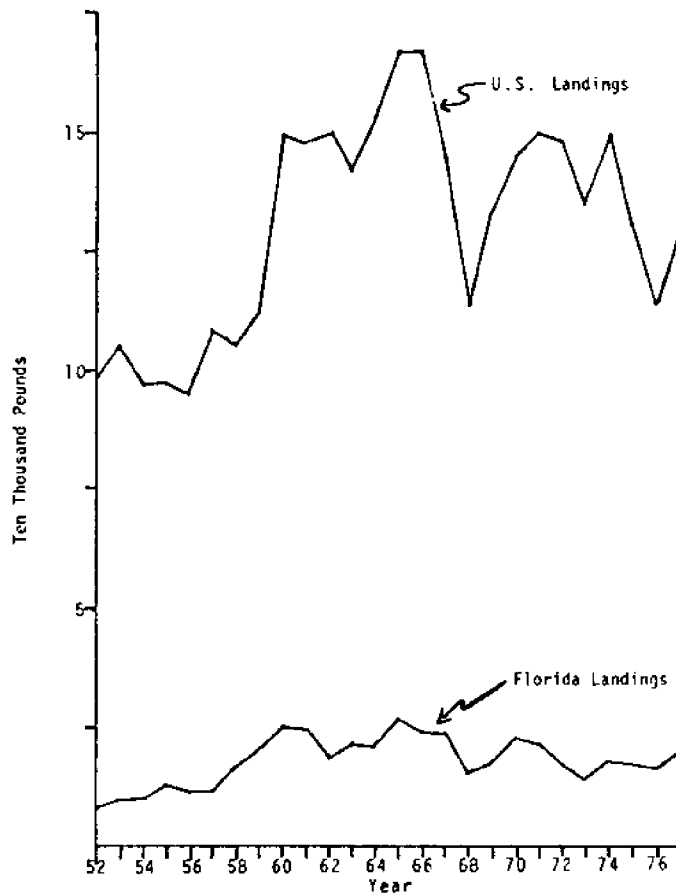


Figure 1. Total U.S. and Florida landings of blue crabs, 1952-77

Maryland received 17.6 cents per pound compared to 13.1 cents in Florida.

### Florida

Florida landings of blue crabs have changed considerably over the past 26 years. Landings increased from 8.2 million pounds in 1952 to 25.6 million pounds in 1960 (Table 2 and Figure 2). This represented over a three-fold increase in landings. The rapid increase was instrumental in making the blue crab fishery a major seafood industry in Florida. After 1960 landings cycled every 4 to 6 years with peaks in 1965, 1970 and 1974, and lows in 1962, 1968 and 1973 (Figure 2).

Table 2.--Total volume and value for blue crabs, east and west coasts of Florida, 1952-77

Year	East Coast		West Coast		Total	
	Volume pounds	Value dollars	Volume pounds	Value dollars	Volume pounds	Value dollars
1952	6,197,036	278,866	1,984,175	89,288	8,181,211	368,154
1953	6,406,924	320,346	3,153,611	126,144	9,560,535	446,490
1954	6,926,673	346,334	2,902,830	145,142	9,829,503	491,476
1955	7,682,817	384,141	4,953,986	247,699	12,636,803	631,840
1956	8,049,138	369,455	3,728,303	182,687	11,777,441	552,142
1957	6,532,664	331,480	5,301,593	286,844	11,834,257	618,324
1958	7,996,509	359,343	8,593,449	460,753	16,689,958	820,596
1959	6,612,535	337,239	13,895,380	680,874	20,507,915	1,018,113
1960	6,961,372	348,069	18,648,092	895,108	29,609,464	1,243,177
1961	7,485,567	344,336	17,129,648	736,575	24,615,215	1,080,911
1962	7,868,572	434,345	10,356,284	486,745	18,224,856	921,090
1963	8,595,139	493,365	13,148,560	644,279	21,743,699	1,137,644
1964	6,950,675	447,623	14,068,519	842,704	21,019,194	1,290,327
1965	5,963,236	410,325	20,597,542	1,184,471	26,560,778	1,594,796
1966	7,323,021	528,722	16,547,202	911,751	23,870,223	1,440,473
1967	9,320,180	634,215	13,975,782	816,579	23,295,962	1,450,794
1968	6,615,292	567,281	9,008,079	673,857	15,623,371	1,241,138
1969	5,724,122	557,086	11,583,661	1,074,115	17,307,783	1,631,201
1970	7,778,479	651,390	14,786,475	1,075,907	22,564,954	1,727,297
1971	9,132,270	837,588	12,278,657	952,006	21,410,927	1,789,594
1972	6,287,525	682,880	10,673,130	958,655	16,960,655	1,641,545
1973	3,913,668	532,004	9,598,245	1,146,897	13,511,913	1,678,901
1974	7,471,709	917,099	10,133,777	1,280,450	17,605,436	2,197,549
1975	4,185,470	636,617	12,806,481	1,584,895	16,991,951	2,221,512
1976	4,024,142	730,049	12,048,444	1,965,572	16,072,586	2,695,621
1977	a	a	a	a	19,256,000 <sup>b</sup>	3,897,000 <sup>b</sup>

<sup>a</sup>Data not available at time of publication.<sup>b</sup>Preliminary data, National Marine Fisheries Statistics, Miami, Florida Laboratory.  
Source: Derived from [1].

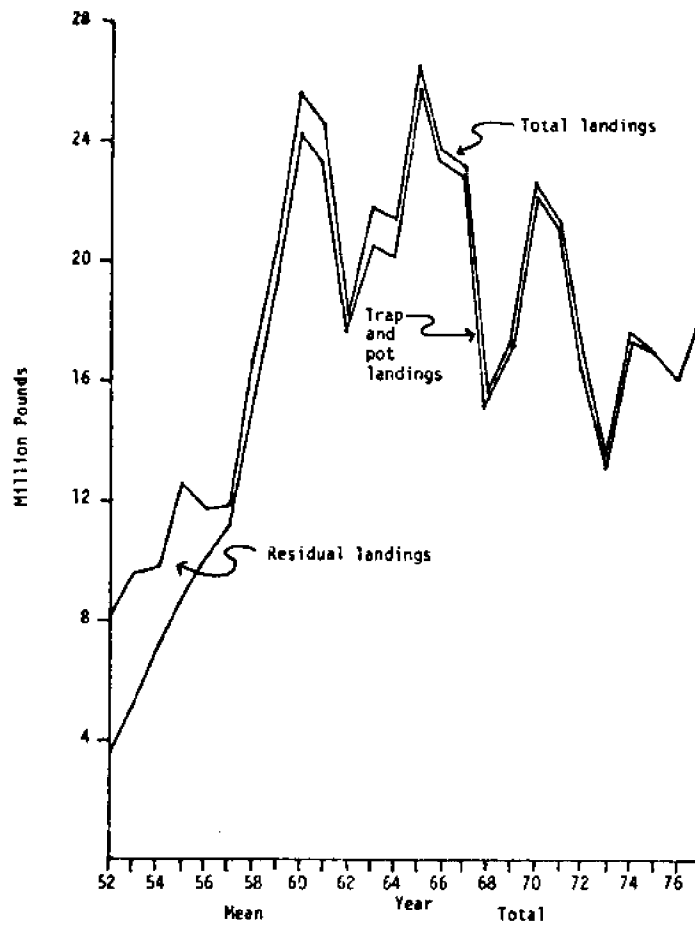


Figure 2.--Total, trap (or pct) and residual Florida blue crab landings, 1952-77

Total Florida landings include both crabs caught by blue crab traps and crabs caught by other means. Blue crabs caught by means other than blue crab traps were caught in otter trawls, dip nets (common and drop), baited trot lines, stone crab and lobster traps. These are referred to as residual catch in Appendix Table 2 and Figure 2. Residual catch was important only during the early fifties. In 1952, crabs caught by these methods accounted for over 55 percent of the total volume of crabs caught. However, residual catch had decreased to approximately 7 percent of the total volume landed in 1957 (Figure 2). Residual catch continued to decline gradually and none were recorded in the published data sources after 1974. Since residual catch represented such a small percentage

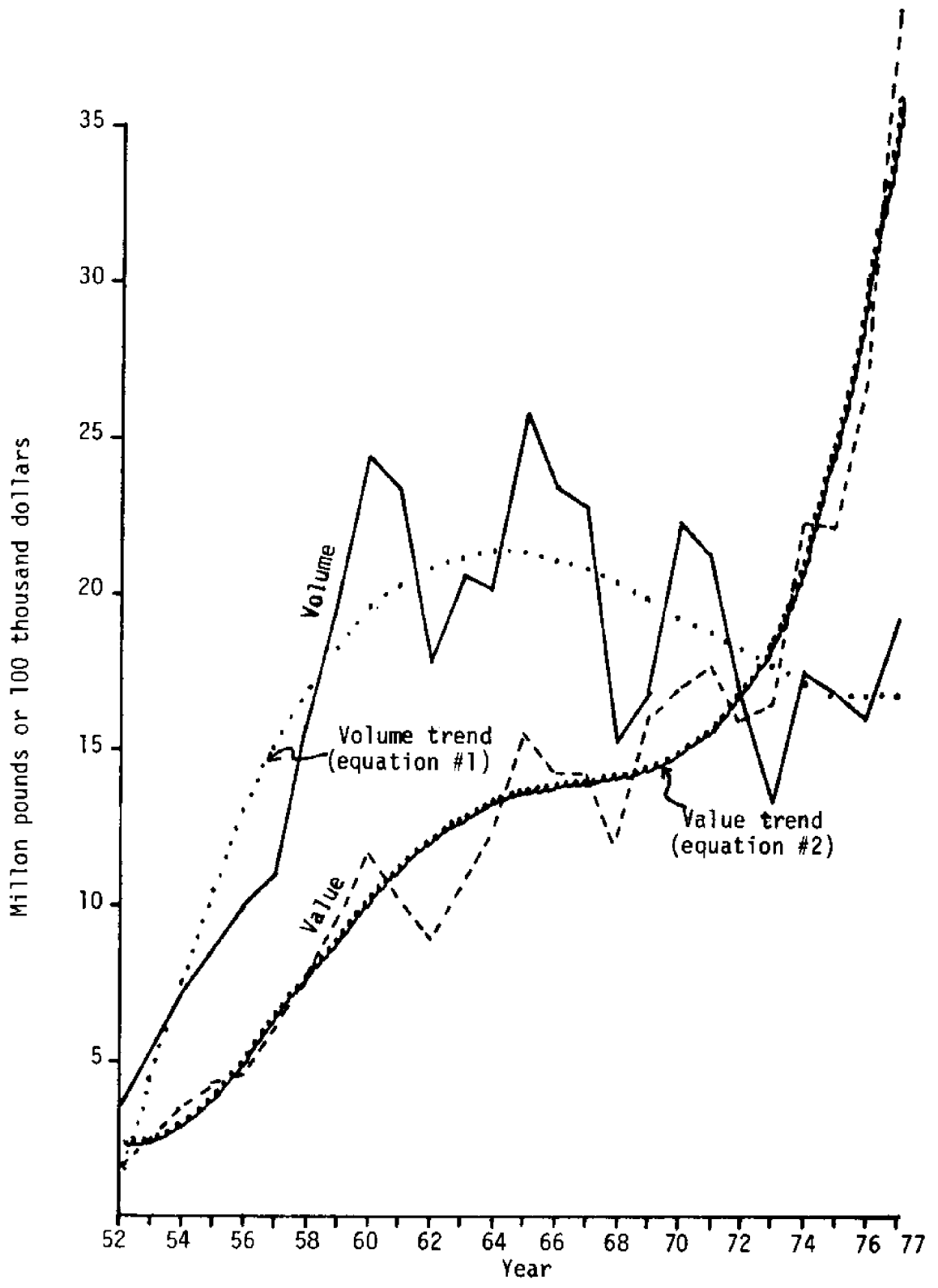


Figure 3.--Total volume and value of blue crabs landed by traps in Florida, 1952-77



of the total volume of crabs landed in Florida, especially from 1957 to 1976, this catch had no effect on the cyclical nature of crab production (Figure 2). The analysis in the remainder of the text refer only to the volume and value of crabs caught by traps.

The total volume of blue crabs caught in traps increased rapidly from 1952 to approximately 24.3 million pounds in 1960 (Figure 3 and Appendix Table 2). The trend was then downward to 1974 at which time it leveled out at approximately 16 million pounds annually. Both the high and low points of the cycle are at lower levels of production after 1965.

Trends in total value of blue crabs landed in Florida by traps was considerably different than that for total volume. The value of blue crab landings increased at an increasing rate during the first eight years from 1952 to 1960. At this point, the estimated trend line leveled off until 1969. After 1969 the value of landings again increased at an increasing rate throughout the rest of the period. The increase in prices more than compensated for the decreasing volume of blue crabs landed during this time period.

#### Landings by County and Coast

The relative importance of blue crab producing counties was determined by calculating 1974-76 average county landings. Seven counties or county regions produced over one million pounds of blue crab annually. Only two of these counties, Putnam and Brevard, were located on the Atlantic Coast. In addition, nine counties landed in excess of 100,000 pounds annually during the 1974-76 period (Figure 4).

Average annual blue crab landings based on a twelve-year average from 1952 to 1963 compared with a thirteen-year average from 1964 to 1976 shows considerable variation for the major counties on both coasts (Table 3). On the east coast, landings for St. Johns and Brevard-Volusia<sup>2</sup> Counties had the largest percentage increase, with increases of 229.4 percent and 106.6 percent, respectively (Table 3). Nassau and St. Lucie Counties had the most dramatic decrease with a 92.7 percent decrease in

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<sup>2</sup>Counties are combined in the data source.

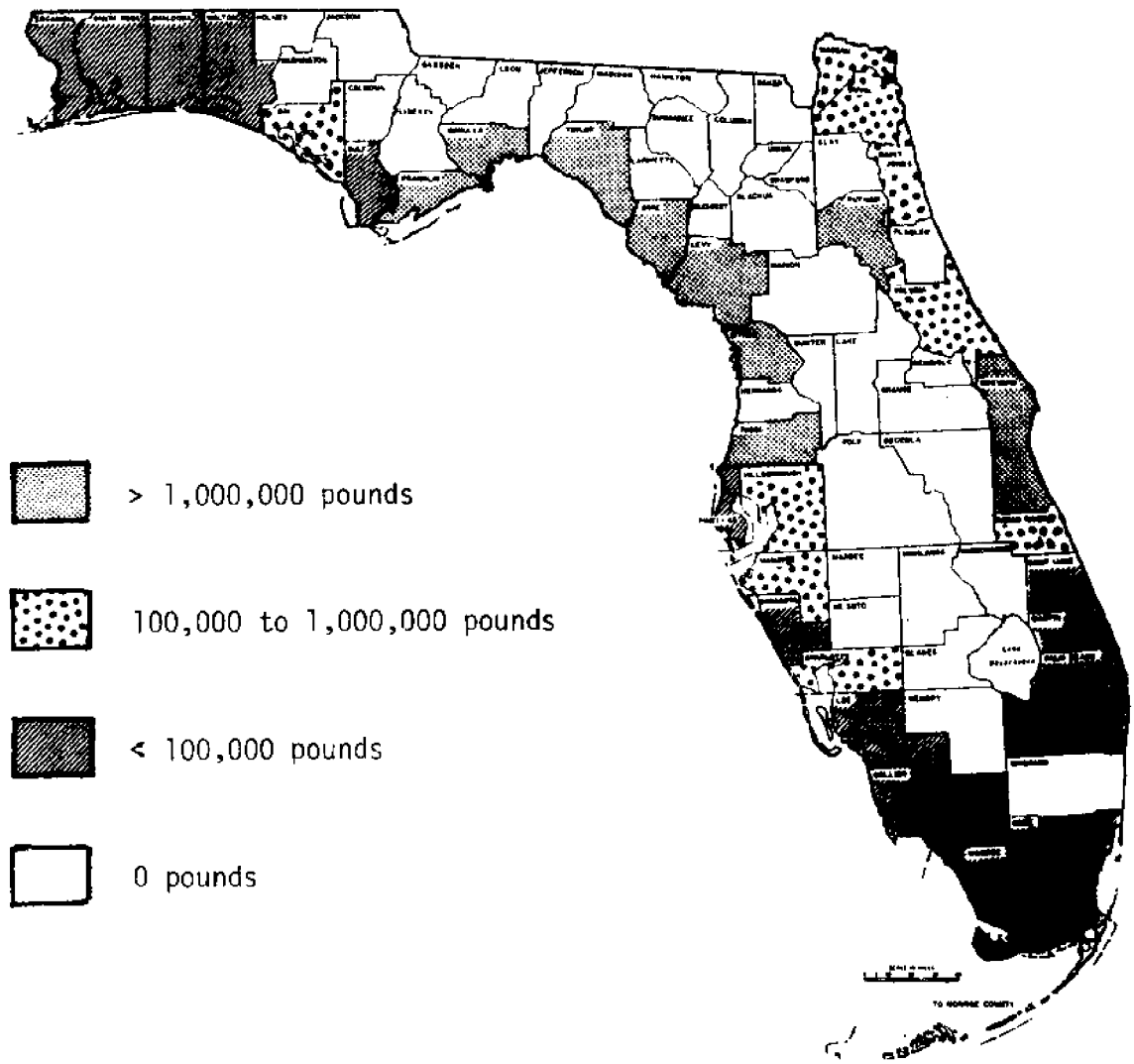


Figure 4.--Average volume of Florida blue crabs landed by county, 1974-76

Nassau County and a 99.0 percent decrease in St. Lucie County (Table 3).

On the west coast, Hillsborough County landings increased over 113 percent between the 1952-63 and the 1964-76 averages (Table 3). The combined counties of Dixie, Taylor, Citrus, Levy and Pasco<sup>3</sup> increased 108.6 percent. Greatest reductions in landings on the west coast occurred in Lee and Manatee Counties. Lee County production decreased 55.6 percent and Manatee County landings dropped by 49.1 percent (Table 3).

Table 3.--Blue crab landings for major Florida crab producing counties, 1952-63 and 1964-77 averages

Coast and County	1952-63 average	1964-77 average	Percent change <sup>a</sup>
-----Pounds-----			
<u>EAST COAST</u>			
St. Johns	336,678	1,109,087	229.4
Brevard & Volusia	1,094,787	2,261,902	106.6
Putnam	507,031	659,313	30.0
Indian River	966,430	738,502	(23.6)
Duval	2,568,424	488,019	(81.0)
Nassau	1,357,345	98,877	(92.7)
St. Lucie	290,890	2,863	(99.0)
<u>WEST COAST</u>			
Hillsborough	264,464	563,730	113.2
Dixie-Taylor, Citrus, Levy, Pasco	2,886,163	6,021,397	108.6
Wakulla	2,111,742	3,205,811	51.8
Franklin	1,151,506	1,366,740	18.7
Charlotte	531,292	606,792	14.2
Manatee	133,920	68,132	(49.1)
Lee	1,377,496	612,128	(55.6)

<sup>a</sup>Parantheses represent a decrease.

Source: Calculated from [1].

Florida east and west coast blue crab fisheries are quite different and can be viewed as two separate fisheries. Landings on the east coast have been fairly stable showing a slight cyclical pattern. Landings

<sup>3</sup>Counties are combined in the data source.

increased considerably through 1956 and then remained relatively stable during the next seven years (Table 2 and Figure 5). After 1963, east coast production shows a four-year cyclic production pattern with lows in 1965, 1969, 1973, 1976 and highs in 1963, 1967, 1971 and 1974. Landings trended upward for a twelve-year period between 1952 and 1964 on the east coast. The overall trend was downward after 1964.

West coast production was at low levels during the early 1950's but began increasing rapidly by mid-decade. By 1958 west coast production surpassed east coast landings and more than doubled those of the east coast in 1959 (Figure 5 and Table 2). Landings continued to increase on the west coast, reaching the first peak of over 18.6 million pounds in 1960. After 1960 the five-year cycle became evident with peaks in 1965, 1970 and 1975, similar to the cyclic nature of total U.S. blue crab landings (Figure 5). The moving average trend showed a substantial upward movement in the volume of crabs caught from 1954 through 1959, after which production tapered off considerably. After the record year in 1965, there was an overall decline in the volume of crabs caught on the west coast (Figure 5).

The trend in total value of blue crabs landed on Florida east and west coasts was upward throughout the 1952-77 period (Figure 6). Value of east coast landings increased at an increasing rate. West coast value of landings increased at a decreasing rate until the mid-1960's and then at an increasing rate for the remainder of the period. Price per pound increased faster than the decreases in landings on both coasts resulting in increased total value.

Prices on both coasts followed basically the same upward trend during the 1952-77 period. Prices increased from 8.4 cents per pound to 18.1 cents per pound on the east coast and increased from 7.3 cents per pound to 16.3 cents per pound on the west coast from 1970 to 1976 (Figure 7). Prices have been consistently higher on the east coast since 1959.

#### Monthly Landings by Coast

Monthly blue crab landings were analyzed for both Florida east and west coasts to determine seasonal trends and changes in seasonality over time. Monthly landings were averaged over five-year intervals for three

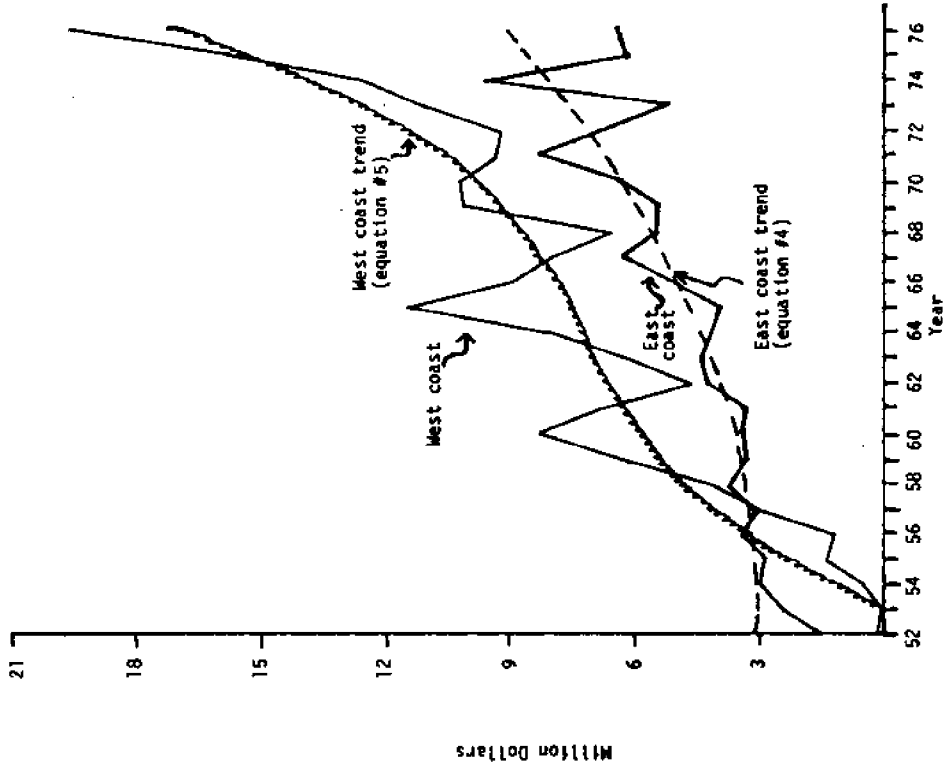


Figure 6.--Total value of blue crab landed with traps on Florida's east and west coasts, 1952-76

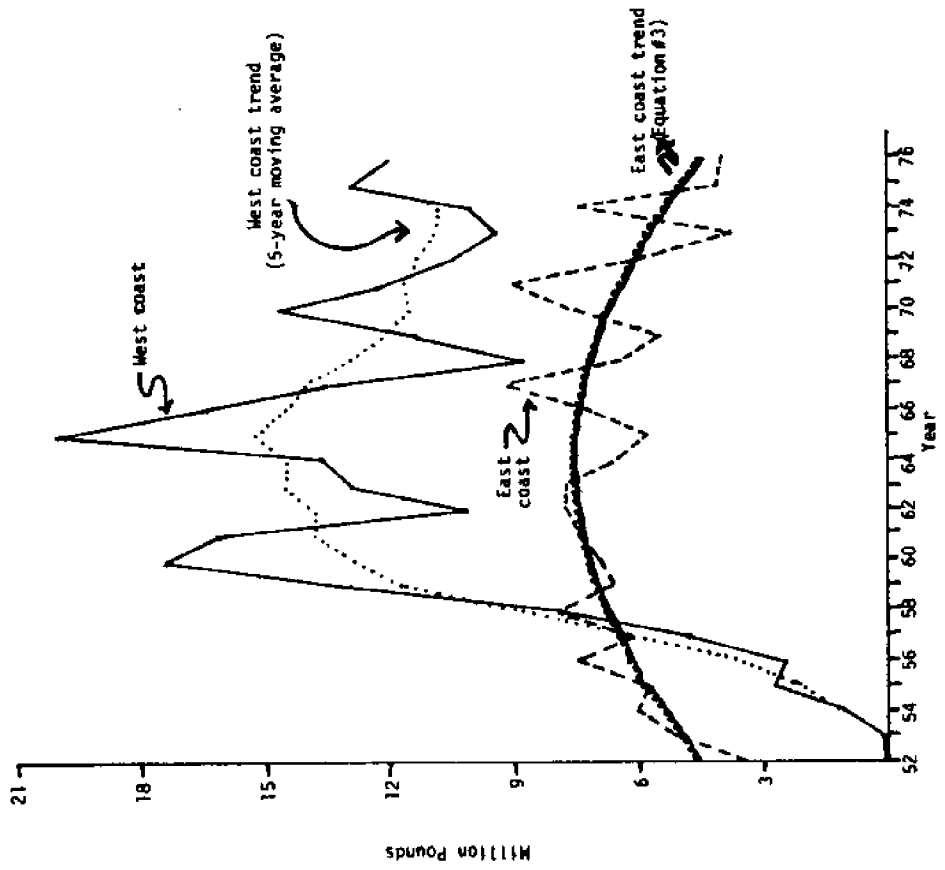


Figure 5.--Total volume of blue crab landed with traps in Florida's east and west coasts, 1952-76

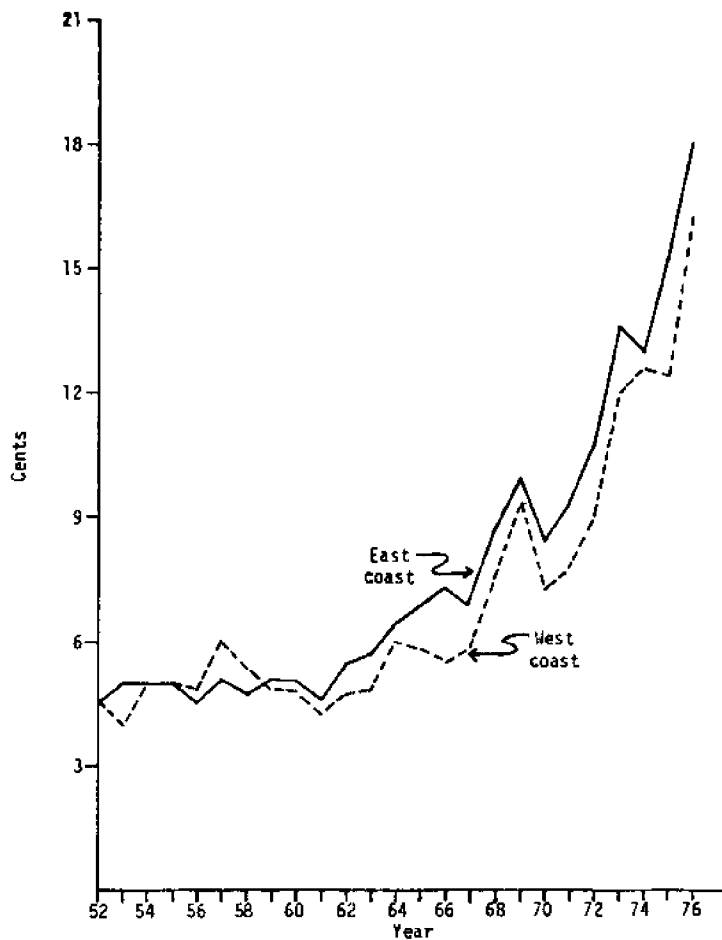


Figure 7.-- Florida east and west coast blue crab prices, 1952-76

time periods: 1962 through 1966, 1967 through 1971, and 1972 through 1977 (Tables 4 and 5).

East coast average monthly landings generally were lowest in February, reaching peaks in the summer months between May and August (Figure 8). The seasonality pattern, however, changed considerably for the three time periods analyzed. The 1962-66 average monthly landings peaked in August while the 1967-71 monthly averages peaked earlier in May. In addition, landings in the first half of the year were usually lower during the 1962-66 period than the latter period with the opposite case for the second half of the year (Figure 8). Average

Table 4.--Blue crab monthly landings with five-year average monthly landings, Florida east coast, 1962-76

	January	February	March	April	May	June	July	August	September	October	November	December
1962	334,449	344,113	328,760	523,768	737,656	728,160	859,074	923,742	1,030,477	833,484	461,949	329,775
1963	250,240	247,352	467,688	524,180	664,397	806,451	974,450	1,197,200	710,041	921,212	507,760	325,848
1964	296,682	269,410	299,413	559,063	640,326	791,875	806,043	615,792	494,813	770,462	573,888	513,014
1965	238,357	205,156	302,257	553,992	608,372	560,062	584,784	795,029	667,730	632,994	394,363	315,978
1966	232,783	279,627	431,016	595,472	759,498	809,832	692,945	716,523	899,186	695,305	510,627	591,224
1962-66 average	270,502	269,132	365,827	551,295	682,050	739,276	783,459	849,657	760,449	770,691	489,717	415,168
1967	498,671	388,957	627,658	612,012	734,042	564,770	755,100	1,265,916	1,256,458	1,338,234	702,077	553,088
1968	358,606	268,712	347,557	612,228	545,860	575,343	823,743	855,999	659,862	784,817	565,733	208,858
1969	188,972	133,181	146,819	416,637	685,560	838,837	723,728	654,282	513,684	436,294	514,064	437,164
1970	257,192	336,208	353,590	459,513	1,463,976	834,173	674,943	551,061	644,674	667,735	595,073	462,625
1971	673,275	522,310	670,251	596,650	633,523	708,532	914,740	710,032	496,651	652,922	521,926	567,209
1967-71 average	395,343	329,874	429,195	539,408	812,592	704,331	778,451	807,458	714,266	776,000	579,775	445,789
1972	571,630	351,285	644,177	742,208	490,493	487,930	581,994	298,796	327,657	302,254	489,842	228,055
1973	184,723	169,746	250,543	415,675	490,810	435,555	477,423	314,618	257,278	273,191	337,203	232,140
1974	394,039	409,593	839,326	476,532	527,981	615,128	1,239,510	708,465	361,278	430,061	341,304	244,942
1975	257,323	190,171	228,562	326,447	373,087	487,195	510,766	409,214	397,895	492,770	377,130	249,366
1976	201,352	210,560	193,408	212,250	299,457	385,836	519,382	509,555	460,684	458,730	273,188	202,190
1972-76 average	321,813	266,271	431,203	434,622	436,366	482,329	665,815	448,130	360,958	391,401	363,733	231,339

-----Pounds-----

Source: Compiled and calculated from [3].

Table 5 ---Blue crab monthly landings with five-year average monthly landings, Florida West Coast, 1962-76

	January	February	March	April	May	June	July	August	September	October	November	December
-----Pounds-----												
1962	562,671	815,132	583,467	719,728	908,108	1,171,048	872,595	836,055	561,724	472,243	525,977	485,105
1963	536,684	525,365	908,146	1,176,664	1,132,593	1,297,767	1,345,823	1,547,034	949,022	825,267	604,484	426,608
1964	405,203	463,526	812,219	1,195,774	1,440,924	2,088,777	1,719,920	1,490,379	1,017,531	969,591	987,501	1,217,405
1965	839,501	514,532	749,773	1,560,506	2,593,775	2,923,961	2,283,086	1,616,517	1,648,394	1,859,299	1,323,906	1,397,600
1966	613,393	413,548	933,229	1,564,219	2,254,673	2,163,951	1,978,257	1,816,109	1,238,058	1,230,462	895,118	888,011
1962-66 average	591,490	546,421	797,367	1,243,378	1,666,015	1,929,103	1,639,936	1,461,219	1,082,946	1,071,372	867,397	882,946
1967	973,197	992,843	1,281,978	1,457,480	1,250,207	1,417,202	1,154,771	1,361,508	947,696	820,037	613,819	604,648
1968	391,869	256,518	720,542	1,002,591	1,215,864	1,144,284	1,139,500	900,625	809,962	599,762	442,911	272,867
1969	305,397	425,662	513,430	1,121,067	1,615,464	1,701,216	1,399,516	1,097,871	999,059	790,828	776,810	707,243
1970	613,798	788,760	1,344,533	1,206,752	1,277,792	1,489,891	1,595,205	1,259,744	1,285,624	1,125,891	765,877	921,913
1971	757,812	882,346	870,241	1,199,793	1,531,401	1,488,928	1,231,120	945,830	941,545	814,915	685,788	700,310
1967-71 average	608,415	669,226	946,145	1,197,537	1,378,146	1,448,304	1,304,022	1,125,116	996,777	830,287	657,041	641,396
1972	609,821	646,527	1,097,811	960,413	1,497,704	886,521	1,033,854	663,014	746,579	459,801	341,042	349,162
1973	354,941	353,222	561,960	888,100	1,346,254	1,492,939	1,071,111	943,255	820,959	761,231	588,586	363,887
1974	566,153	686,442	1,103,517	983,212	1,123,860	892,205	974,586	822,054	765,501	739,734	564,244	651,470
1975	920,525	1,217,960	926,439	1,379,754	1,601,620	1,198,541	1,202,245	1,088,892	994,422	944,989	480,935	697,019
1976	349,514	1,261,614	895,373	1,233,585	1,253,321	2,184,141	1,224,259	1,082,817	1,075,851	718,420	467,920	298,229
1972-76 average	560,191	833,153	917,020	1,089,093	1,364,552	1,330,869	1,101,811	920,006	880,662	724,835	488,545	471,953

Source: Compiled and calculated from [3].



monthly landings in the 1972-76 period were considerably less than landings in most months for the first two periods. For each time period landings began to gradually decline after the summer peaks reaching a low in December, January or February.

Seasonality of west coast monthly landings was much more consistent than the east coast pattern. In all three time periods monthly landings began increasing in January or February and reached a peak during June. Landings then decreased for the remainder of the year (Figure 9). The west coast in a similar fashion to the east coast showed a decline in average monthly landings between the three time periods. The highest average monthly volume for the west coast occurred during the 1962-66 period (Figure 9). Average monthly landings declined during the 1967-71 period and dropped even lower during the 1972-76 months, especially during the months of April through December (Figure 9). These comparisons emphasize the decrease in annual landings of blue crabs on both and east and west coasts of Florida since 1962.

#### LABOR AND CAPITAL TRENDS

This section describes and analyzes the amount of labor and capital involved in landing Florida blue crabs from 1952 to 1977. Labor in the blue crab fishery is defined in this report as the number of commercial fishermen fishing for blue crabs on boats, shore and vessels. These fishermen are further categorized into the two subgroups of full-time and casual fishermen. Casual fishermen in the reported data are defined to earn less than 50 percent of their income fishing.

Capital invested in the commercial fishery is not reported in monetary units. Consequently, the number of boats, vessels and the number of traps employed by fishermen is used as an approximate measure of physical capital units in this report.

As in the previous sections, the analysis begins with a statewide review of labor and capital input trends in the blue crab fishery from 1952 through 1977. These trends are then disaggregated for the east and west coasts of the state.

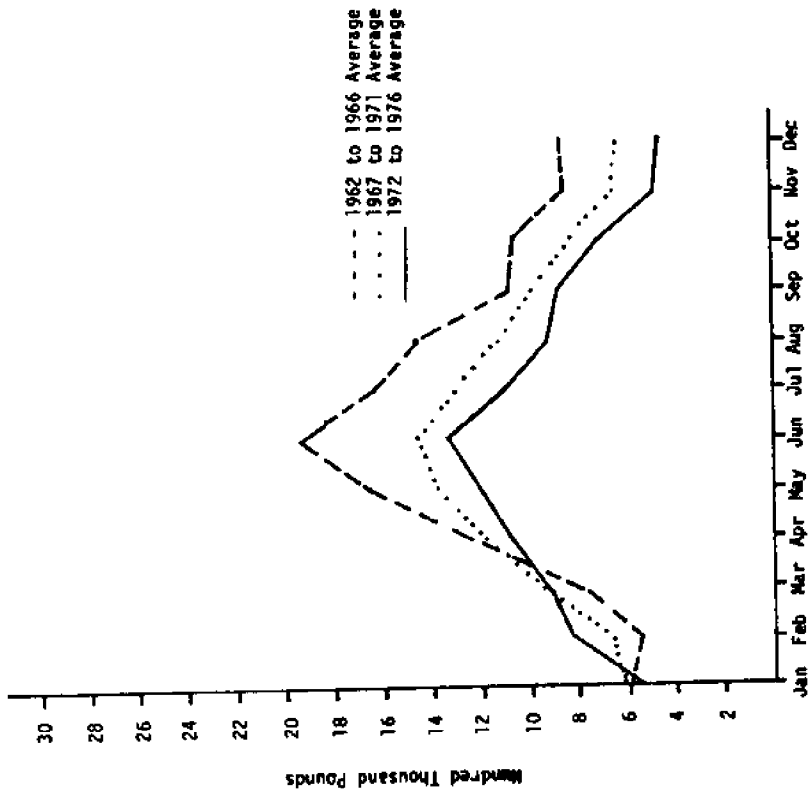


Figure 9.--Florida west coast five-year monthly averages, blue crab landings, 1962-76

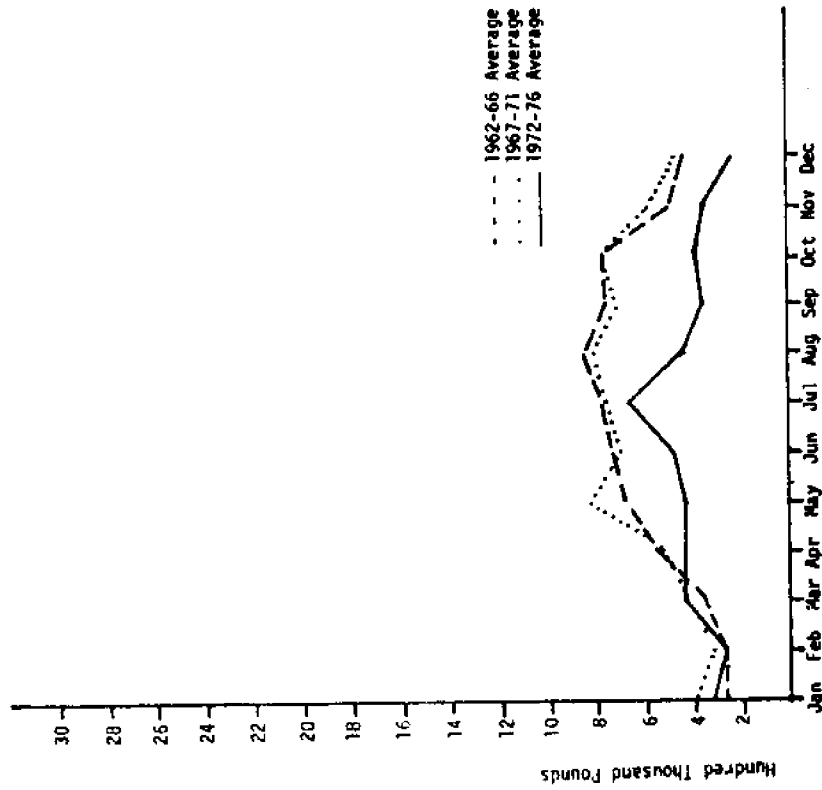


Figure 8.--Florida east coast five-year monthly averages, blue crab landings, 1962-76

FloridaFishermen

The total number of Florida blue crab fishermen has varied widely from year to year for the past 26 years (Figure 10). There were only 151 Florida blue crab fishermen in 1952. The number increased to a high of 493 fishermen in 1965. The overall number of fishermen increased during the seven-year period between 1952 and 1959 (Figure 10). Fishermen then left the industry during the next several years until 1963 after which more fishermen again began fishing for blue crabs. By the 1965-67 period the number of fishermen peaked approximately at 490 (Figure 10 and Table 6). The overall number of blue crab fishermen declined after 1967, reaching a low in 1973 (Figure 10 and Table 6).

The trend in the number of regular fishermen was very similar to the total number of fishermen in Florida (Figure 11). The trend in number of regular fishermen was upward during the period between 1952 and 1959 as well as between 1962 and 1966. Since 1968 the number of fishermen generally declined reaching a recent low of 235 in 1971 (Figure 11 and Table 6).

The number of casual fishermen remained fairly constant between 1955 and 1964 (Figure 11). Beginning in 1965 the trend in number of casual fishermen began increasing at a decreasing rate and reached a peak in 1971. After 1971 the trend in the number of casual fishermen declined rapidly through 1974 (Figure 11 and Table 6). The trend in number of casual fishermen began an upward movement at approximately the same time the trend in number of regular fishermen began to decline. This suggests that some full-time crabbers may have entered the part-time ranks. This may be explained in part by the low price received for blue crabs during the 1965 through 1971 seasons (Table 2). Alternatively, employment outside of fishing may have become more attractive.

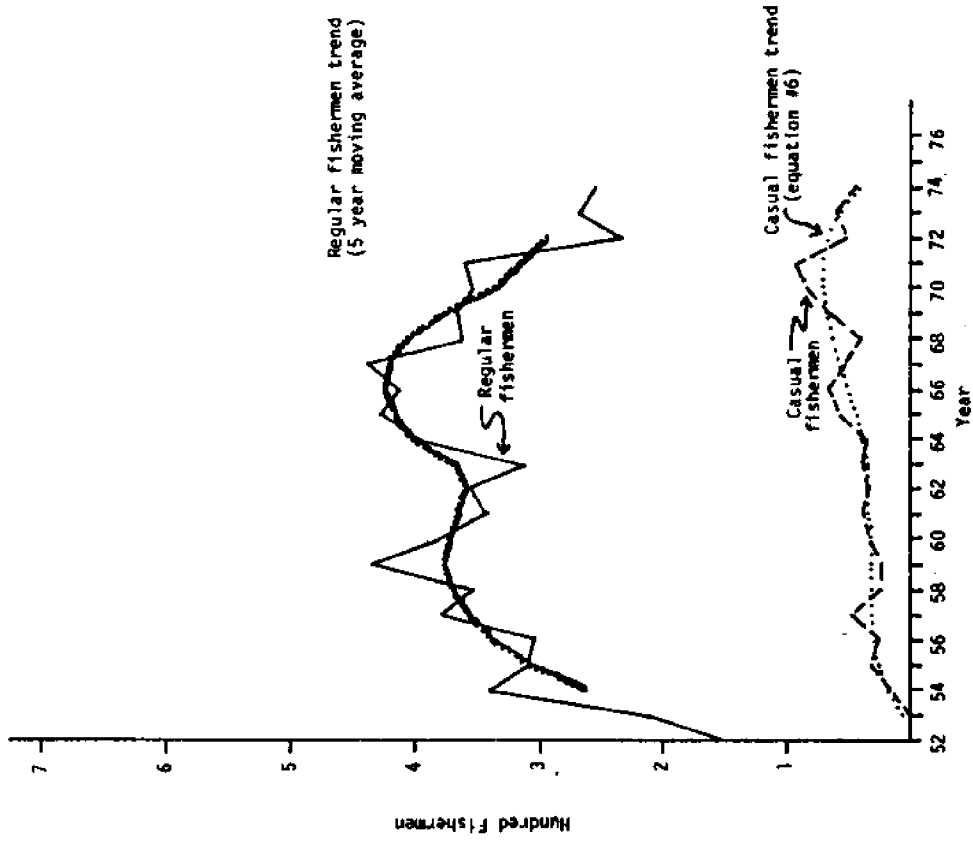


Figure 11. ---Regular and casual blue crab fishermen in Florida, 1952-74

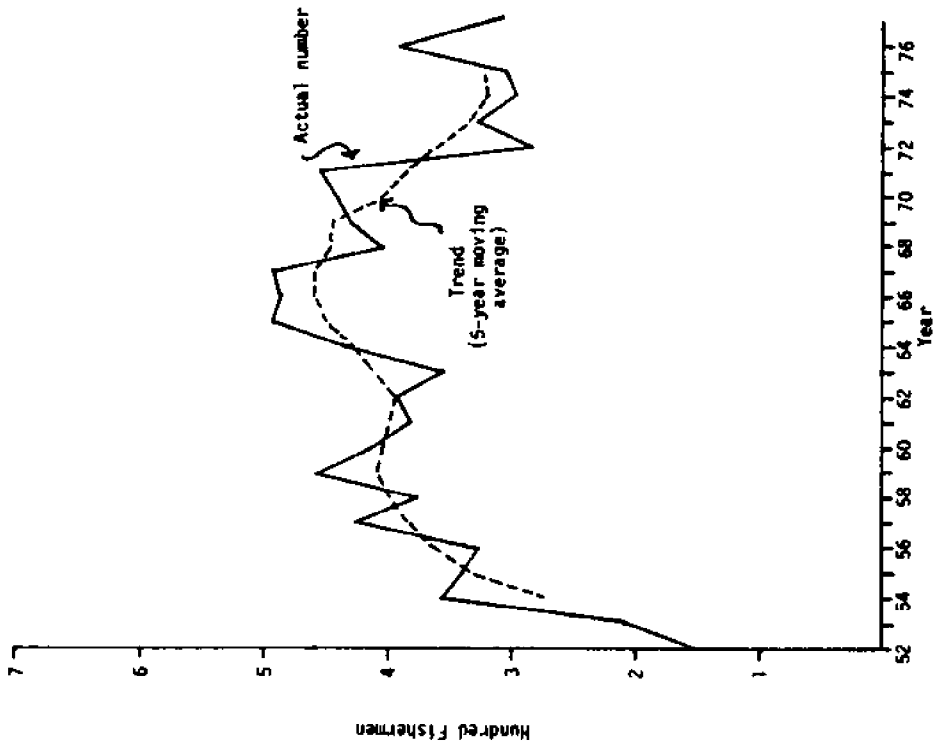


Figure 10. ---Blue crab fishermen in Florida, 1952-77

Table 6.--Blue crab physical capital and labor inputs, Florida, 1952-77

Year	Fishermen			Total	Boats	Vessels	Traps	Firms
	Vessels	Boats and Shore						
	Regular	Regular	Casual					
-----Number-----								
1952	2	149	-	151	131	1	11,115	132
1953	-	210	-	210	198	-	19,650	198
1954	-	339	16	355	308	-	32,554	308
1955	-	310	31	341	324	-	30,970	324
1956	-	303	25	328	316	-	29,460	316
1957	-	378	47	425	390	-	43,130	390
1958	-	355	22	377	358	-	39,531	358
1959	-	433	22	455	422	-	54,575	422
1960	-	382	31	413	391	-	44,225	391
1961	-	343	38	381	363	-	41,898	363
1962	-	356	36	392	369	-	45,414	369
1963	4	315	38	357	337	2	44,345	339
1964	6	393	35	434	395	3	62,485	398
1965	8	428	57	493	452	4	72,277	456
1966	10	414	64	488	439	5	66,690	444
1967	2	439	52	493	454	1	66,350	455
1968	2	362	40	404	374	1	54,199	375
1969	2	367	63	432	407	1	59,021	408
1970	2	354	85	441	392	1	58,840	393
1971	2	360	93	455	419	1	61,730	420
1972	-	235	51	286	282	-	37,965	282
1973	-	268	60	328	324	-	46,135	324
1974	-	256	43	299	284	-	47,945	284
1975 <sup>a</sup>	b	b	b	305	288	-	50,700	288
1976 <sup>a</sup>	b	b	b	390	370	-	53,110	370
1977 <sup>c</sup>	b	b	b	304	300	-	49,355	300

<sup>a</sup>Data acquired from the National Marine Fisheries Service, Statistics, Miami, Florida Laboratory.

<sup>b</sup>Data not available at time of publication.

<sup>c</sup>Preliminary data acquired from the National Marine Fisheries Service, Statistics, Miami, Florida Laboratory.

Source: Derived from [4].

### Firms

The number of blue crab fishing firms is not reported in published statistics. Given that most Florida blue crab fishing firms operate one boat or vessel an estimate of the number of firms may be given as the total number of craft. Using this estimating procedure the total number of Florida firms fishing for blue crabs is primarily determined by the number of boats since only a few blue crab craft are classified as vessels (Table 6). The only vessels recorded as fishing for blue crabs were during 1952 and during the nine-year period between 1963 and 1971. The maximum number of vessels was recorded at 5 vessels in 1966 and then declined to 1 vessel by 1962.

The total number of firms and the total number of blue crab fishermen in Florida is about equal. On the average there are 1.07 fishermen per firm. This indicates that nearly all firms (boats) are one-man operations.

The overall number of firms is somewhat cyclic, showing a rapid increase through the 1950's followed by a slight decline through 1963. Peaks were reached in 1965 and 1967 (Figure 12). For the next seven years, the overall trend for number of firms was considerably downward. However, after 1974 the number of firms appears to be on a gradual upward direction. This may suggest price is again the incentive for the increase in the number of firms since dockside prices began increasing substantially from 1973 through 1977 (Table 1).

### Traps

The total number of blue crab traps fished in Florida during the 26-year period ranged from a low of 11,115 in 1952 to a high of 72,277 in 1965. This represented a 550 percent increase during this 14-year period (Figure 13 and Table 7). After 1965 the total number of blue crab traps began to decline and dropped by 47 percent to just under 38,000 in 1972 (Figure 13 and Table 6). The number of blue crab traps then increased to 53,110 in 1976 but then again dropped slightly in 1977.

The number of traps showed a rapid overall upward trend between 1954 and 1959 and also between 1962 and 1966 (Figure 13). During the

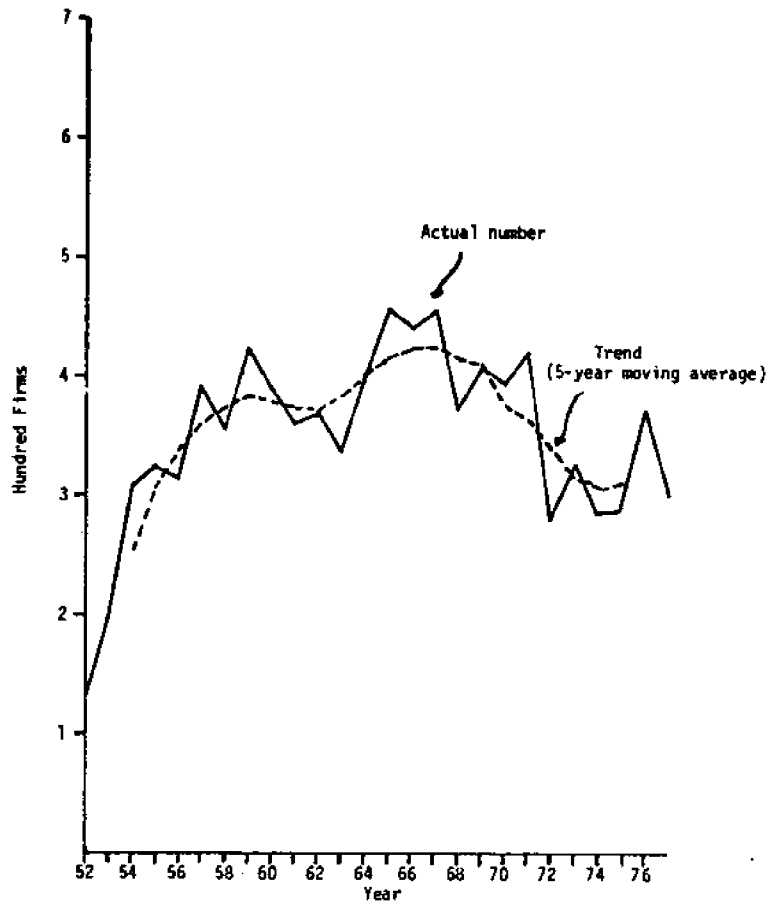


Figure 12.--Blue crab firms in Florida, 1952-77

three years between 1959 and 1962 the number of traps was upward but at a much slower rate. After the 1966 season, the trend declined substantially through 1972. However, by 1976 the number of traps again showed a slightly upward trend (Figure 13).

### East and West Coast

#### Fishermen

Total number of fishermen on the east coast peaked early during the 25-year period between 1952 and 1976 (Figure 14 and Table 7). A peak of 206 fishermen fished for blue crabs on the east coast during 1954. The number of fishermen then declined for the next 12 years, but then again reached near record levels in 1968 and 1971. Since that

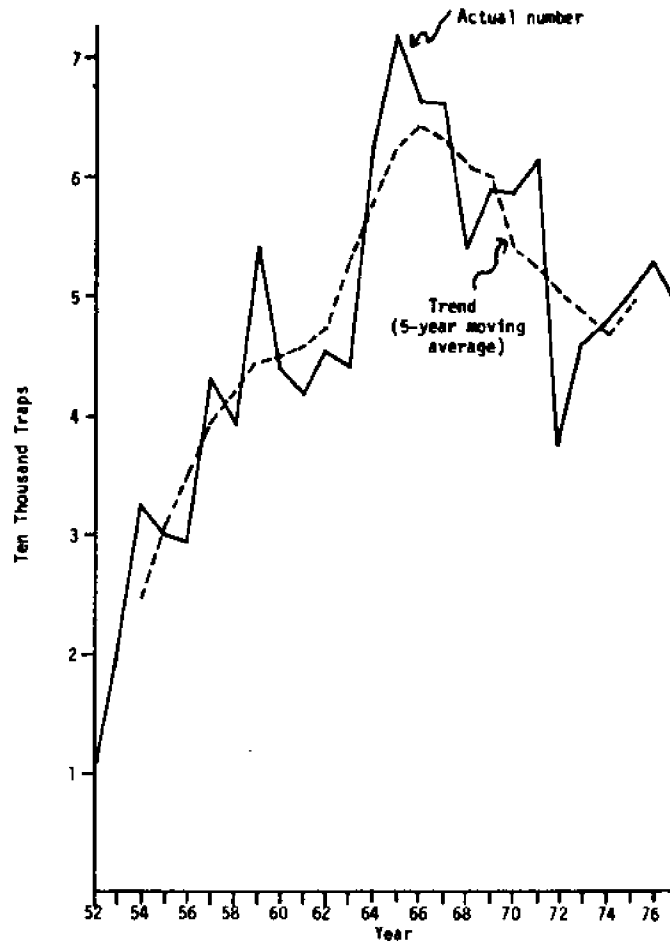


Figure 13.--Blue crab traps fished in Florida, 1952-77

time the number of east coast fishermen declined (Table 7). The overall trend in number of east coast blue crab fishermen has been declining since 1969 (Figure 14).

Total number of fishermen on the west coast reached a high of 367 in 1965 (Figure 14 and Table 7). This was approximately 56 percent higher than the record number of fishermen on the east coast. The low occurred in 1952 when only 37 fishermen fished for blue crabs on the west coast. Unlike east coast fishermen, the trend for the number of west coast fishermen was rapidly upward through 1958 (Figure 14). From 1959 to 1962 the number remained fairly stable but then turned upward through 1965. After 1965, there was a continuous downward trend until 1974 (Figure 14). The number of west coast fishermen again increased noticeably by 1976.



Table 7.--Blue crab capital and labor inputs, Florida east and west coasts, 1952-1976

Year	Boats		Vessels		Traps		Firms		Vessels		Fishermen					
	East	West	East	West	East	West	East	West	East	West	Regular		Casual		Total	
											East	West	East	West	East	West
1952	104	27	-	1	6,910	4,205	104	28	-	2	114	35	-	-	114	37
1953	134	64	-	-	9,075	10,575	134	64	-	-	141	69	-	-	141	69
1954	192	116	-	-	15,889	16,665	192	116	-	-	205	134	1	15	206	149
1955	192	132	-	-	14,970	16,000	192	132	-	-	182	128	10	21	192	149
1956	156	160	-	-	11,585	17,875	156	160	-	-	151	152	5	20	156	172
1957	172	218	-	-	15,865	27,265	172	218	-	-	151	227	24	23	175	250
1958	167	191	-	-	14,015	25,516	167	191	-	-	167	188	2	20	169	208
1959	135	287	-	-	14,835	39,720	135	287	-	-	128	305	7	15	135	320
1960	131	260	-	-	9,925	34,300	131	260	-	-	116	266	15	16	131	282
1961	146	217	-	-	11,540	30,358	146	217	-	-	122	221	26	12	148	233
1962	149	220	-	-	13,355	32,059	149	220	-	-	128	228	21	15	149	243
1963	135	202	-	2	12,815	31,530	135	204	-	4	121	194	14	24	135	222
1964	122	273	-	3	13,600	48,885	122	276	-	6	106	287	16	19	122	312
1965	126	326	-	4	13,257	59,020	126	330	-	8	112	316	14	43	126	367
1966	118	321	-	5	14,020	52,670	118	326	-	10	110	294	8	56	118	360
1967	163	291	-	1	22,450	43,900	163	292	-	2	145	294	18	34	163	330
1968	192	182	-	1	28,175	26,024	192	183	-	2	174	188	18	22	192	212
1969	186	221	-	1	30,100	28,921	186	222	-	2	171	196	15	48	186	246
1970	169	223	-	1	27,900	30,940	169	224	-	2	139	215	30	55	169	272
1971	187	232	-	1	25,735	35,995	187	233	-	2	153	207	35	58	188	267
1972	96	186	-	-	9,560	28,405	96	186	-	-	82	153	14	37	96	190
1973	124	200	-	-	16,975	29,160	124	200	-	-	91	177	33	27	124	204
1974	96	188	-	-	20,200	27,745	96	188	-	-	87	169	19	24	106	193
1975 <sup>a</sup>	97	191	-	-	16,400	34,300	97	191	-	-	b	b	b	b	113	192
1976 <sup>a</sup>	90	280	-	-	14,180	38,930	90	280	-	-	b	b	b	b	98	292

<sup>a</sup>Data acquired through National Marine Fisheries Service, Statistics, Miami, Florida Laboratory.

<sup>b</sup>Data not available at time of publication.

Source: Derived from [4].

The average percentage of casual fishermen compared to total fishermen has been 10 percent on the east coast and 14.4 percent on the west coast for the total study period. The percentage of casual fishermen to total fishermen during the last five years of recorded data has shown a minor increase to 11.4 percent for the east coast and a more substantial increase to 18.1 percent for the west coast (Table 7). This suggests either a gradual increase in the number of part-time crabbers on both coasts or an increase in proportion of their total income coming from non-fishery sources.

### Firms

The total number of firms on the east coast is estimated to be equal to the number of boats since no vessels were fishing out of the east coast ports during the 25-year period 1952 and 1974 (Table 7). Most west coast firms also used boats rather than vessels. Only a limited number of vessels was reported in 10 or the 25 year period as previously described.

There is slightly more fishermen per firm on the west coast than the east coast. There was an average of 1.01 fishermen per firm on the east coast and 1.11 fishermen per firm on the west coast during the study period.

The peak number of firms on the east coast occurred in three years--1954, 1955 and 1968, each with 192 firms (Figure 15 and Table 7). The lowest number of blue crab firms was 90 in 1976 (Figure 15 and Table 7). The estimated moving average trend for the east coast was upward through 1956, then downward until 1964. The number of firms again was upward the next 5 years through 1969, but afterwards declined steadily (Figure 15).

The west coast trend was much different than the east coast trend. The number of blue crab firms increased substantially through 1959, remained constant for 3 years, then moved upward again through 1965 (Figure 15). The next 8 years brought about a decline in the number of firms. However, in 1974 the trend again turned upward (Figure 15). This is due to a rather large increase in the number of firms during 1976 (Figure 15). The number of firms peaked in 1965 with 330 firms and was the lowest with 28 firms in 1952 for the 25-year period (Figure 15, Table 7).

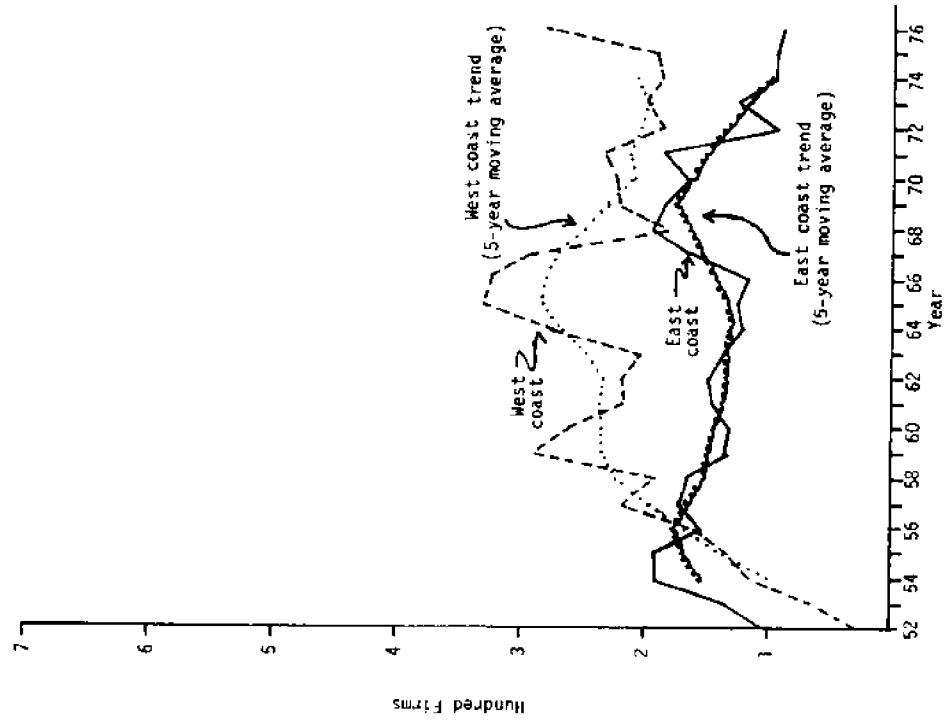


Figure 15.--Blue crab firms in the Florida east and west coasts, 1952-76

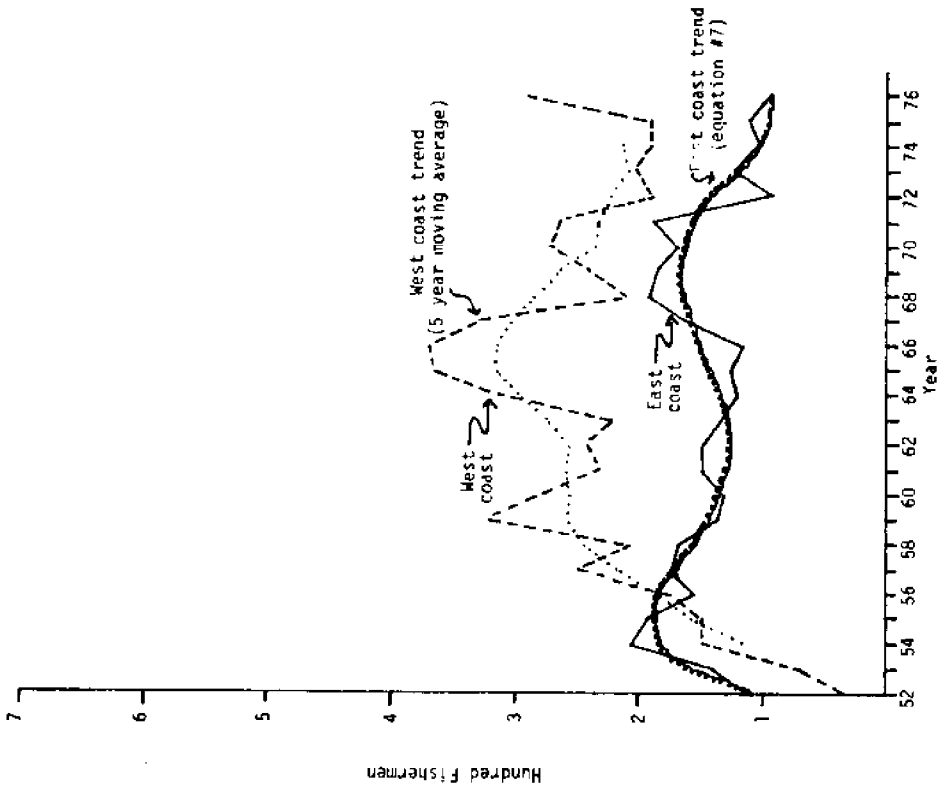


Figure 14.--Blue crab fishermen in the Florida east and west coasts, 1952-76

## Traps

Total number of blue crab traps fished peaked at just over 30 thousand in 1969 for the east coast and at 59 thousand in 1965 for the west coast (Figure 16 and Table 7). The lowest number of traps fished during this 25-year time period occurred during 1952 for both coasts.

Strong upward trend was estimated for total blue crab traps fished on the east coast during the periods 1952 to 1954 and 1963 to 1970. In the remaining years, the trend for number of traps showed a decline (Figure 16).

Number of blue crab traps on the west coast was dramatically upward through 1965, but then took a turn downward through 1970 (Figure 16). Since 1970 there appears to be a slight upward trend in number of traps fished on the west coast.

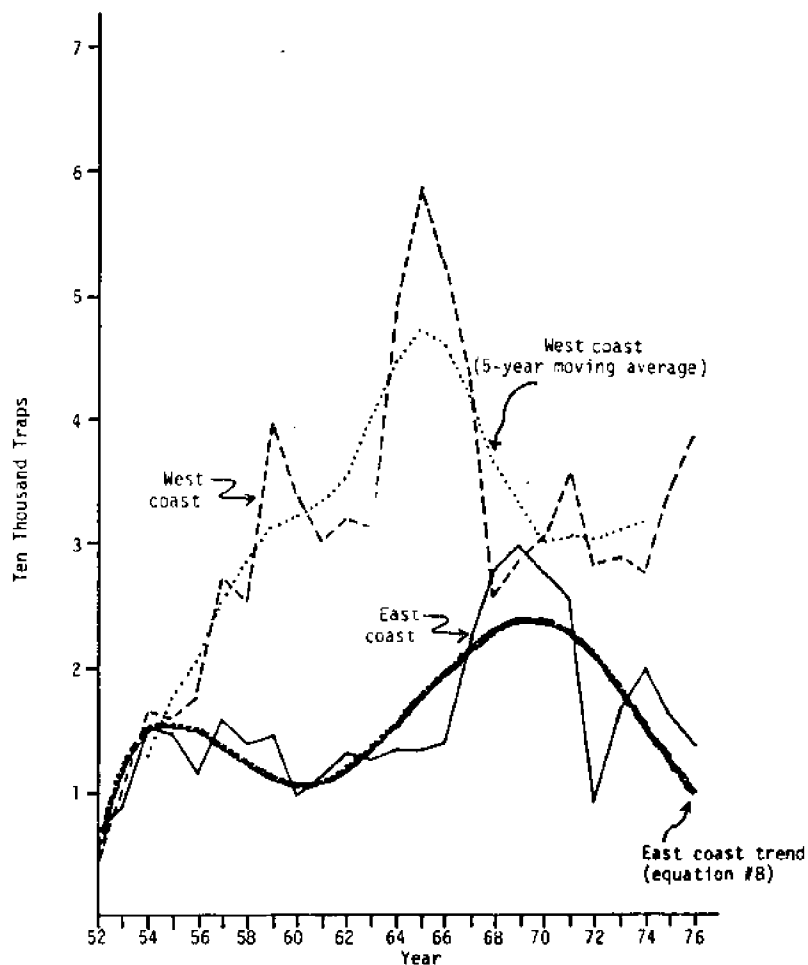


Figure 16.--Blue crab traps fished in the Florida east and west coasts, 1952-76

## PRODUCTIVITY TRENDS

This section analyzes dockside volume and value of blue crabs landed commercially per unit of labor and capital inputs. Since the number of fishermen is very similar to the number of firms (most blue crab boats being one-man operations), output per fisherman and output per trap are the only categories that are discussed in the text. Data on output per firm are however, included in the Tables and Figures. As in previous sections, an overall view of Florida blue crab production is discussed initially and then followed by a discussion of production on each coast.

FloridaVolume and Value per Fisherman and Firm

The volume of blue crabs landed per fisherman in Florida increased dramatically during the early years of the twenty-six year period. Between 1954 and 1961 these landings increased over 200 percent (Figure 17 and 18 and Table 8). This represents an increase from 19.9 thousand pounds to 61.6 thousand pounds for each fisherman during this seven-year period. Landings per fisherman were sporadic after 1961, showing peaks during 1963, 1965, 1970, 1972, 1974 and 1977 (Figures 17 and 18). The estimated overall trend in volume per fisherman peaked between 1962 and 1963 and then declined through 1970. During the following six years, the trend was upward to previous record levels.

Value per fisherman showed an upward trend for the entire 26-year period (Figures 19 and 20). Value per fisherman increased at an increasing rate from 1953 to 1959 and from 1967 to 1977. During the remaining years, the estimated trend increased at a decreasing rate (Figures 19 and 20). The rapid increase during the 1967-77 period was the result of both a rapid increase in blue crab dockside prices and an increase in volume landed per fisherman.

Volume and Value per Trap

Volume of blue crabs landed per trap reached a high in 1961 of 560 pounds, representing an increase of 71.7 percent in 10 years (Figure 21

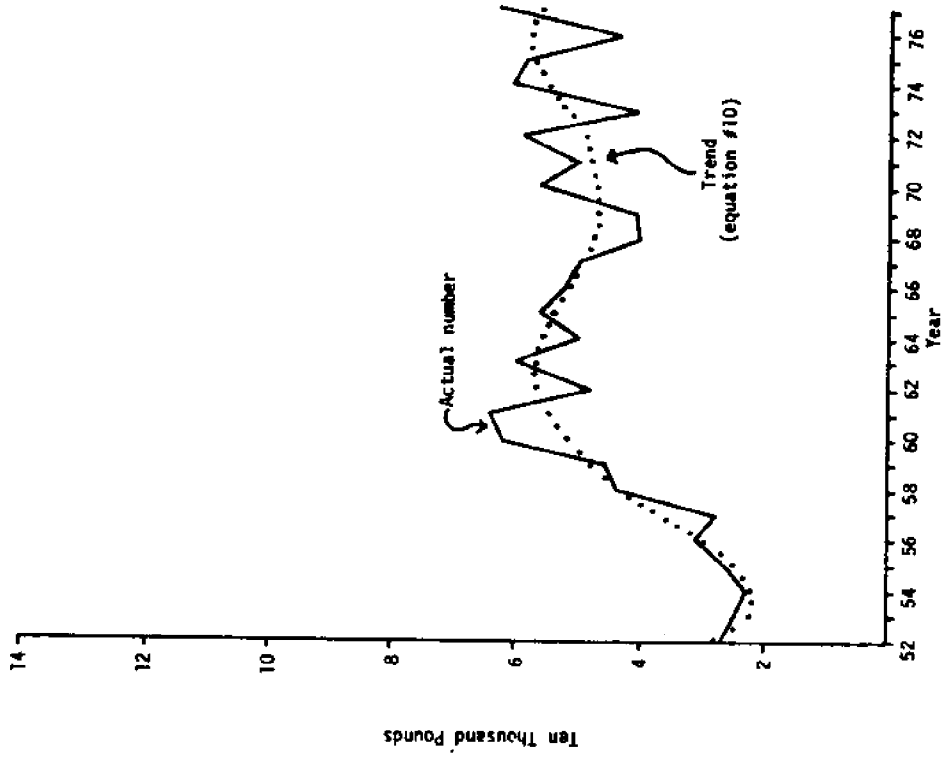


Figure 18.--Blue crabs landed per firm in Florida, 1952-77

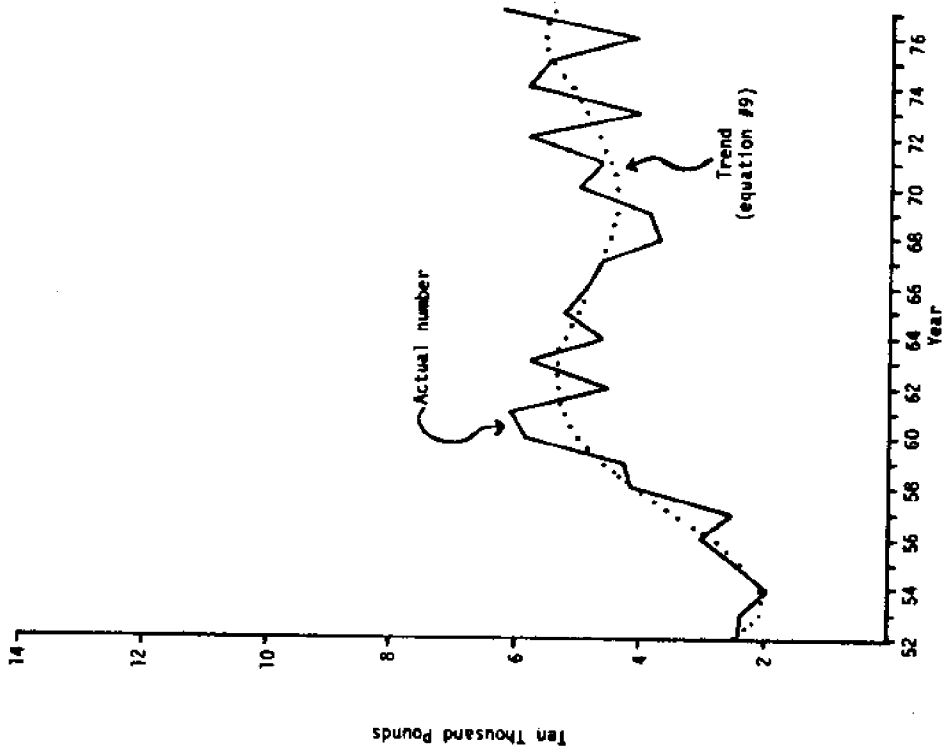


Figure 17.--Blue crabs landed per fisherman in Florida, 1952-77

Table 8.--Total volume and value of blue crabs landed per firm, per trap, and per fisherman, 1952-77

Year	Volume per firm		Value per firm		Volume per trap		Value per trap		Volume per fisherman		Value per fisherman	
	Pounds		Dollars		Pounds		Dollars		Pounds		Dollars	
1952	27,474		1,236		326		14.68		24,017		1,081	
1953	25,262		1,263		255		12.72		23,819		1,190	
1954	22,976		1,149		217		10.87		19,934		997	
1955	26,461		1,323		277		13.84		25,142		1,257	
1956	31,601		1,465		339		15.75		30,445		1,412	
1957	28,246		1,549		255		14.00		25,920		1,421	
1958	44,090		2,196		399		19.89		41,868		2,085	
1959	46,083		2,289		356		17.70		42,741		2,123	
1960	62,119		3,017		549		26.68		58,810		2,857	
1961	64,637		2,841		560		24.61		61,583		2,706	
1962	48,315		2,439		393		19.82		45,481		2,296	
1963	60,632		3,153		464		24.11		57,575		2,994	
1964	50,727		3,113		323		19.83		46,520		2,855	
1965	56,638		3,414		357		21.54		52,388		3,158	
1966	52,845		3,198		352		21.29		49,086		2,971	
1967	50,230		3,142		344		21.55		46,359		2,900	
1968	40,742		3,252		282		22.50		37,818		3,019	
1969	41,431		3,931		286		27.18		39,129		3,713	
1970	56,751		4,340		379		28.99		50,574		3,868	
1971	50,672		4,235		345		28.81		46,774		3,909	
1972	59,189		5,729		440		42.56		58,361		5,649	
1973	41,077		5,112		288		35.90		40,576		5,050	
1974	61,607		7,869		365		46.61		58,516		7,475	
1975	59,000		7,714		335		43.82		55,711		7,284	
1976 <sup>a</sup>	43,439		7,285		303		50.75		41,212		6,912	
1977 <sup>a</sup>	64,187		12,990		390		78.96		63,342		12,819	

<sup>a</sup>Data in part were acquired through the National Marine Fisheries Service, Statistics, Miami, Florida, Laboratory.

Source: Calculated and compiled from [1,4].

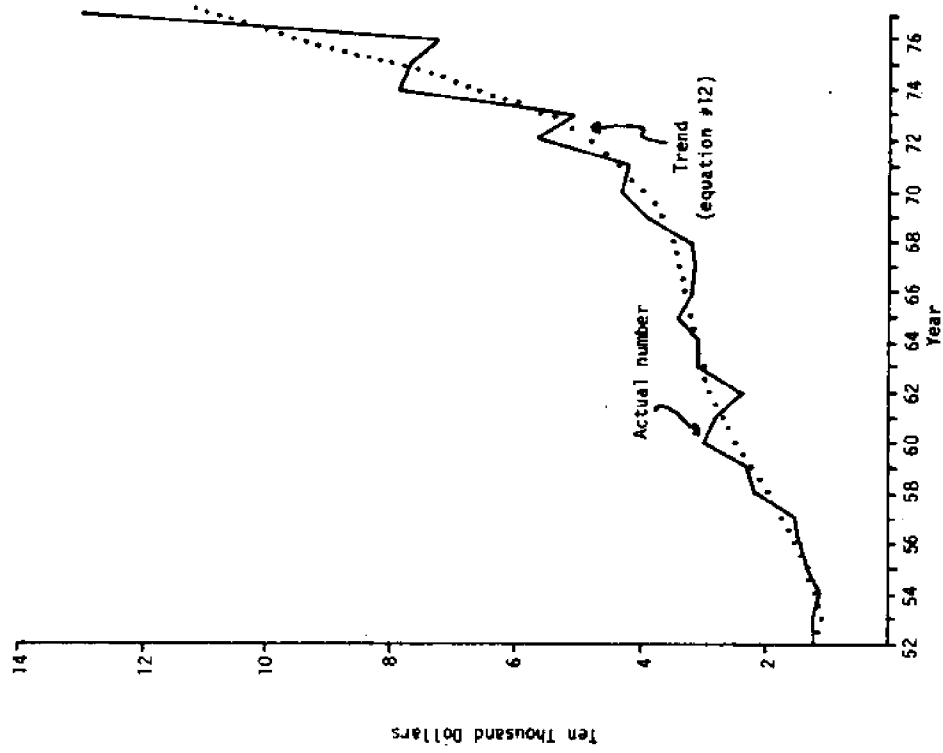


Figure 20.--Value of blue crabs landed per firm in Florida, 1952-77

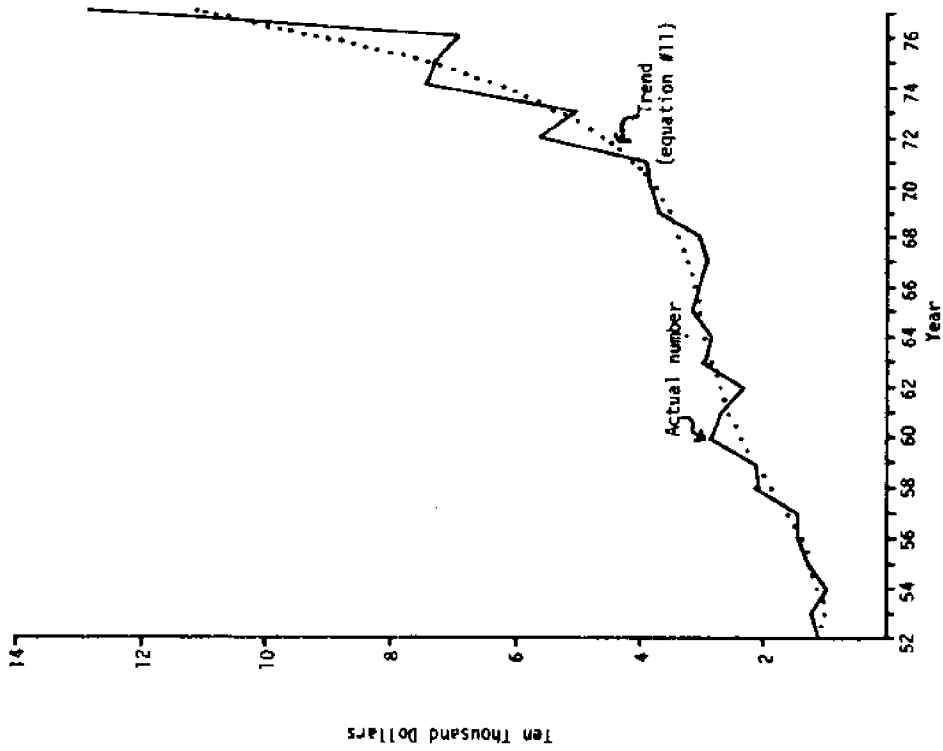


Figure 19.--Value of blue crabs landed per fisherman in Florida, 1952-77



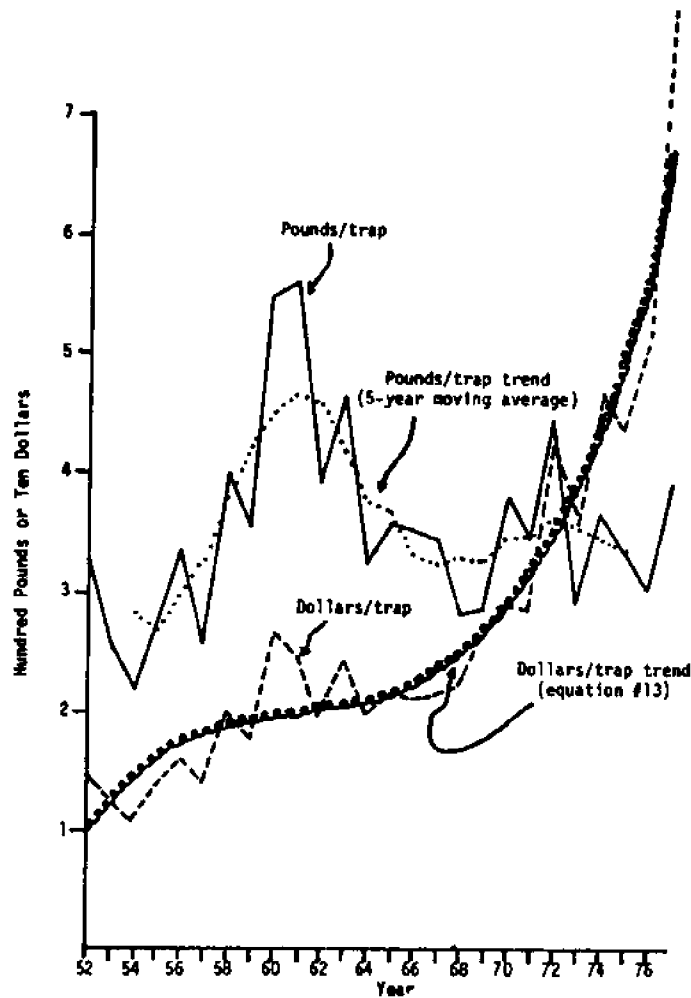


Figure 21.--Volume and value of blue crabs landed per trap in Florida, 1952-77

and Table 8). The rapid increase during 1959 through 1961 was brought about by a drop in the number of traps in 1960 and an unusually high volume landed during the same time period (Figures 3 and 13). Due to these annual changes in number of traps and landings throughout the 26-year period annual productivity per trap varied considerably. The overall estimated trend in landings per trap was upward through 1961, declining through 1966 and then again upward through 1972 (Figure 21).

Value of blue crabs landed per trap followed the same basic patterns as volume per trap for the first fifteen years because of the relatively stable dockside prices. In the remaining 12 years, value per trap increased rapidly because of the rapid increase in dockside price (Figure 21). The estimated trend shows value per trap increased

at a decreasing rate during the first thirteen years between 1952 and 1964 and at an increasing rate the last thirteen years between 1965 and 1977 (Figure 21).

#### East and West Coast

Trends by coast were calculated only for the 25-year period from 1952 to 1976 due to the unavailability of 1977 Florida blue crab data by coast at the time of this analysis.

#### Volume and Value per Fisherman and Firm

Volume of blue crabs landed per fisherman on the east coast were sporadic from 1952 to 1958 and from 1965 through 1976, with the later years showing greater yearly variations in landings (Figures 22 and 23 and Table 9). Volume per fisherman showed little yearly variation during 1958 to 1965. The yearly variations in landings per fisherman from 1952 through 1959 can be explained by variation in total pounds of blue crabs landed since the number of fishermen was relatively stable during that period (Figure 14). The large yearly variations during the last 12 years of recorded data were due to inverse movements in the number of fishermen and east coast landings. The overall trend in volume of blue crabs landed per fisherman on the east coast was generally upward from 1953 to 1965 followed by a rapid decline between 1965 and 1969 (Figures 22 and 23). The trend again was positive from 1969 to 1972 after which there was a slight decline (Figures 22 and 23).

West coast volume of blue crabs landed per fisherman increased rapidly until 1961 when a peak of 68.9 thousand pounds per fisherman were reported (Figures 24 and 25). Landings per fisherman after 1961 then became cyclic, peaking during the years 1963, 1965, 1970, 1972 and 1975 while reaching lows during 1962, 1964, 1967, 1971, 1973 and 1976 (Figures 24 and 25 and Table 9). The estimated trend for landings per fisherman on the west coast was strongly upward through 1962 and then declined through 1966. During 1966 through 1969 no trend was apparent but since then landings per fisherman increased slightly (Figures 24 and 25).

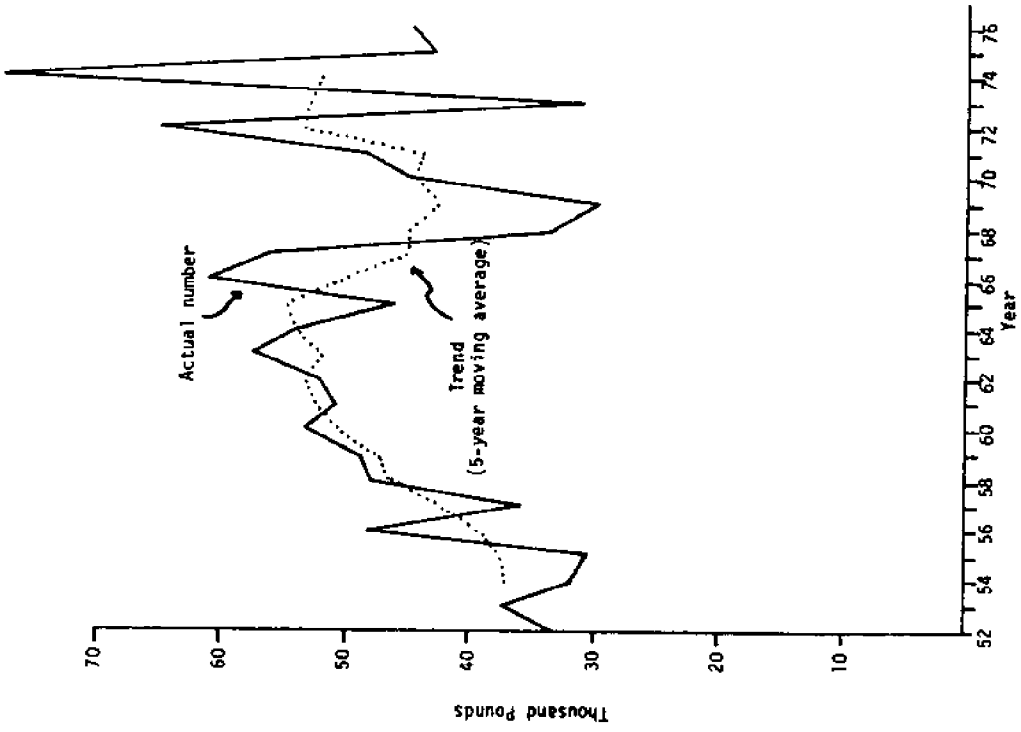


Figure 23.--Volume of blue crabs landed per firm on the Florida east coast, 1952-76

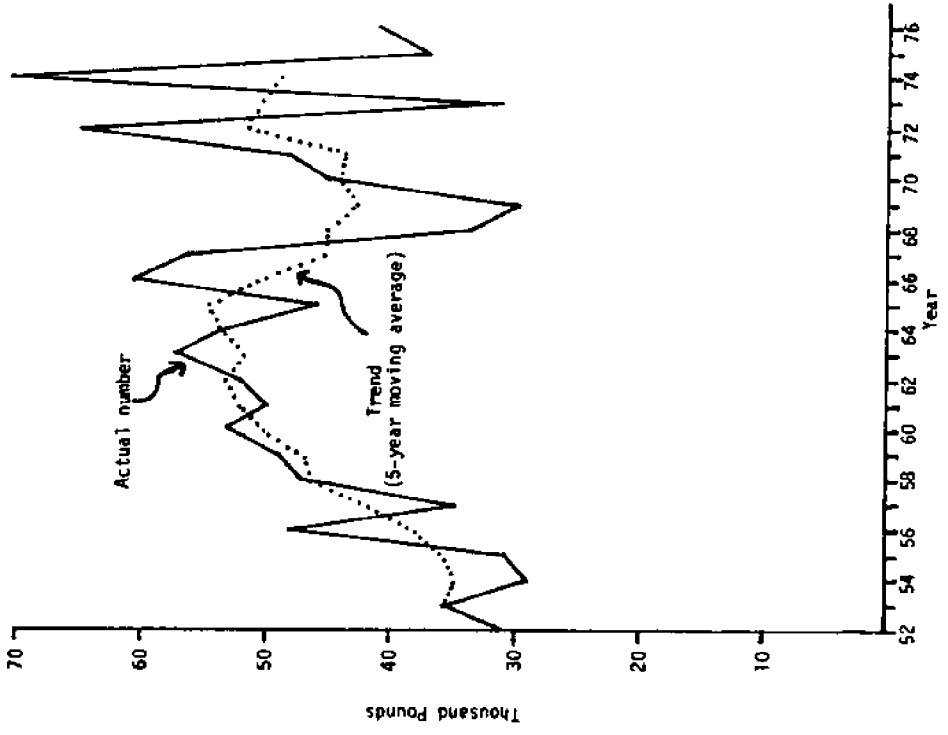


Figure 22.--Volume of blue crabs landed per fisherman in the Florida east coast, 1952-76

Table 9.--Total volume and value of blue crabs landed per firm, per trap, and per fisherman, Florida east and west coasts, 1952-76

Year	Volume/trap		Value/trap		Volume/fishermen		Value/fishermen		Volume/firm		Value/firm	
	East	West	East	West	East	West	East	West	East	West	East	West
1952	505	32	23	1	30,631	3,638	1,378	164	33,577	4,807	1,511	216
1953	550	1	28	a	35,409	133	1,770	5	37,259	144	1,863	6
1954	380	63	19	3	29,280	7,013	1,464	351	31,415	9,009	1,571	450
1955	390	171	20	9	30,407	18,357	1,520	918	30,407	20,721	1,520	1,036
1956	647	139	30	7	48,052	14,476	2,206	692	48,052	15,561	2,206	744
1957	388	178	20	11	35,169	19,445	1,785	1,167	35,783	22,299	1,816	1,338
1958	570	306	27	16	47,252	37,493	2,206	1,987	47,818	40,830	2,233	2,164
1959	445	323	23	16	48,909	40,138	2,494	1,967	48,909	44,754	2,494	2,193
1960	700	506	35	24	53,021	61,499	2,651	2,952	53,021	66,703	2,651	3,202
1961	641	529	29	23	49,990	68,947	2,300	2,965	50,675	74,031	2,331	3,183
1962	581	314	32	15	52,050	41,452	2,863	1,948	52,050	45,786	2,863	2,152
1963	603	407	34	20	57,234	57,783	3,262	2,831	57,234	62,881	3,262	3,081
1964	483	279	31	17	53,801	43,672	3,466	2,616	53,801	49,369	3,466	2,957
1965	438	339	30	20	46,082	54,553	3,192	3,147	46,082	60,669	3,192	3,499
1966	510	310	37	17	60,614	45,308	4,405	2,501	60,614	50,033	4,405	2,761
1967	408	312	28	18	56,236	41,480	3,852	2,430	56,236	46,878	3,852	2,746
1968	228	341	20	26	33,401	41,817	2,884	3,140	33,401	48,444	2,884	3,638
1969	185	392	18	36	29,962	46,060	2,962	4,281	29,962	51,039	2,962	4,744
1970	274	474	23	34	45,167	53,934	3,780	3,923	45,167	65,491	3,780	4,763
1971	353	339	32	26	48,307	45,695	4,431	3,542	48,565	52,363	4,454	4,059
1972	652	368	70	33	64,974	55,080	7,054	4,939	64,974	56,203	7,054	5,045
1973	228	324	31	39	31,207	46,271	4,240	5,543	31,207	47,196	4,240	5,653
1974	368	363	48	46	70,110	52,149	9,088	6,589	77,414	53,536	10,034	6,764
1975 <sup>a</sup>	255	373	39	46	37,039	66,700	5,634	8,255	43,149	67,050	6,563	8,298
1976 <sup>a</sup>	284	309	51	50	41,063	41,262	7,449	6,731	44,713	43,030	8,111	7,020

<sup>a</sup>Preliminary data from the National Marine Fisheries Service, Statistics, Miami, Florida Laboratory.

Source: Calculated and compiled from [1,4].

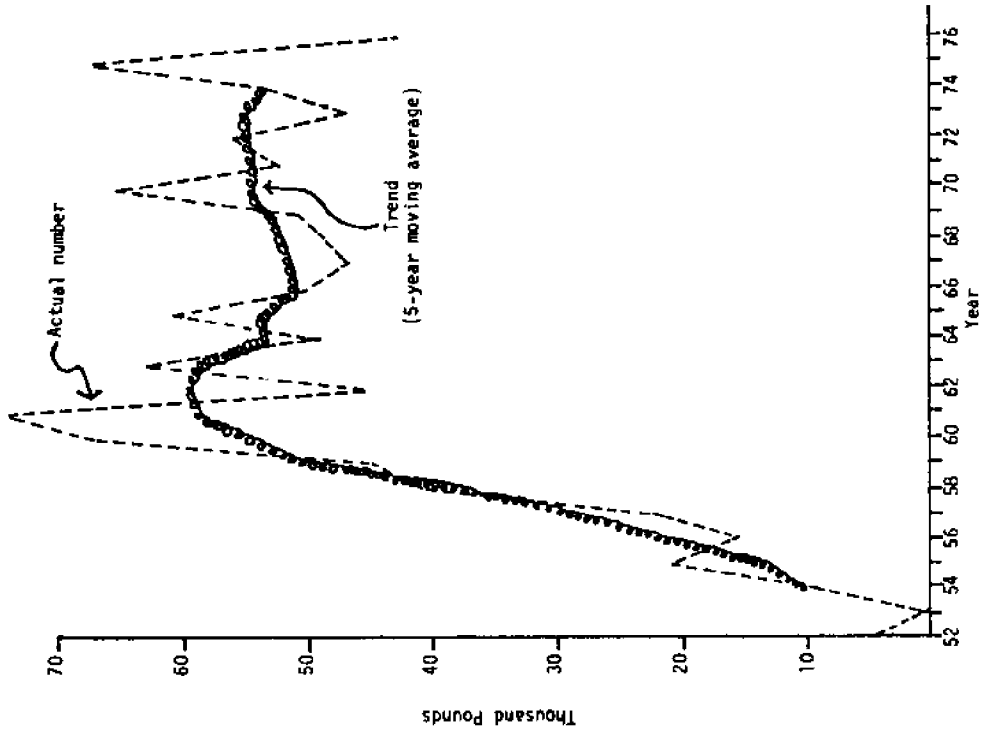


Figure 25.--Volume of blue crabs landed per firm on the Florida west coast, 1952-76

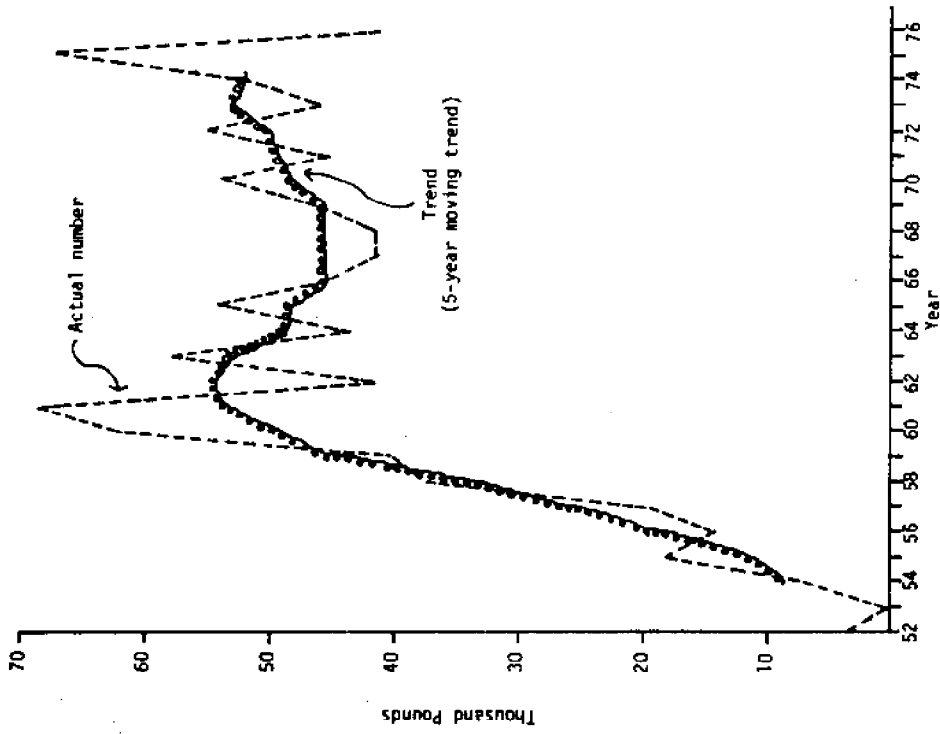


Figure 24.--Volume of blue crabs landed per fisherman on the Florida west coast, 1952-76

On the east coast value of blue crabs landed per fisherman followed the same annual variations as volume per fisherman. However, these annual variations generally increased over time due to the annual increases in price per pound (Figures 26 and 27 and Table 9). The estimated trend for value per east coast fisherman was gradually upward until 1965 where it became relatively stable for the four years through 1969 (Figures 26 and 27). The trend rapidly turned upward after 1970 due to the rapid increase in both the dockside price per pound and pounds landed per trap.

Estimated trend in value per fisherman on the west coast increased at a decreasing rate from 1952 through 1965 and then at an increasing rate for the remainder of the period (Figures 28 and 29). This trend is generally a result of the rapid increase in dockside price.

#### Volume and Value per Trap

Volume of blue crabs landed per trap on the east coast showed a large amount of annual variation throughout the study period (Figure 30 and Table 9). Volume of blue crabs caught per trap varied between 380 pounds and 700 pounds during the 1952-1960 time period. After 1960, volume per trap decreased substantially from the 700 pounds to 185 pounds in 1969 (Figure 30). Since 1969 annual variations in volume per trap were again high, ranging from 652 pounds per trap in 1972 to 228 pounds of blue crabs a year later. The overall trend in blue crab production per trap has declined on the east coast of Florida since 1960 (Figure 30).

West coast volume of blue crabs landed per trap increased rapidly the first 10 years, reaching a high of 529 pounds of blue crabs in 1961 (Figure 31 and Table 9). For the remaining fifteen years landings per trap showed some variation ranging from a low of 279 in 1964 to a high of 474 in 1970. The overall trend for blue crabs landed per trap has been slightly downward on the west coast, since 1960.

The estimated trend in value per trap in the east coast blue crab fishery was upward from 1956 to 1962 (Figure 32). The trend was then downward through 1969 when the value per trap reached a low at \$18 (Figure 32, Table 9). After 1969, the trend again showed a rapidly upward swing in value per trap as a result of increases in dockside prices.

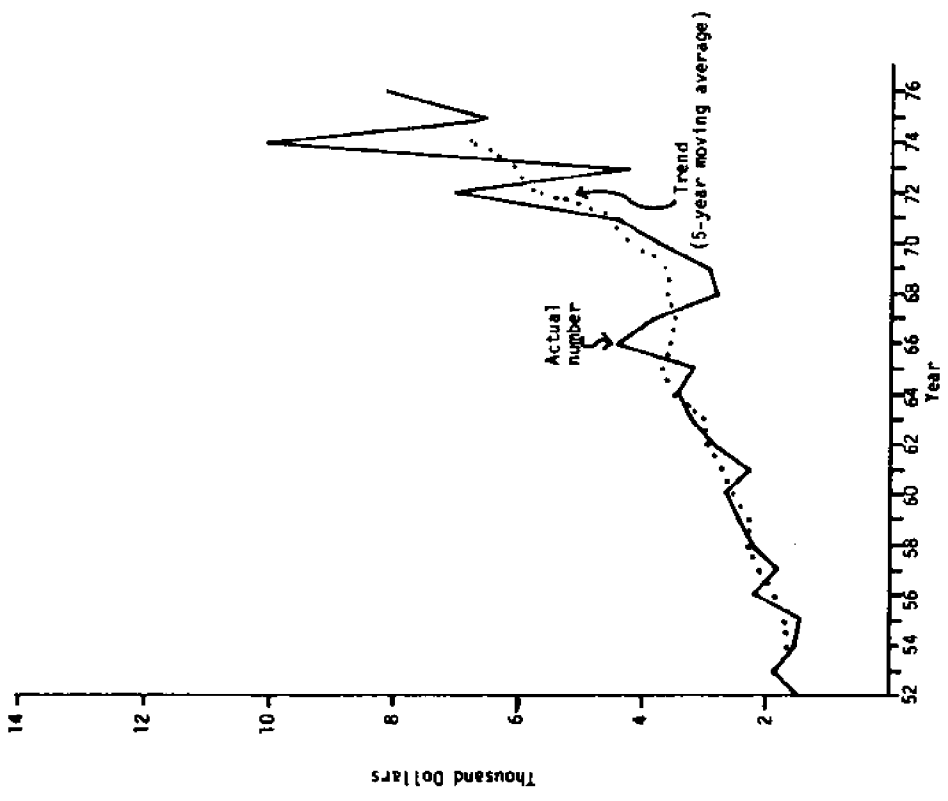


Figure 27.--Value of blue crabs landed per firm on the Florida east coast, 1952-76

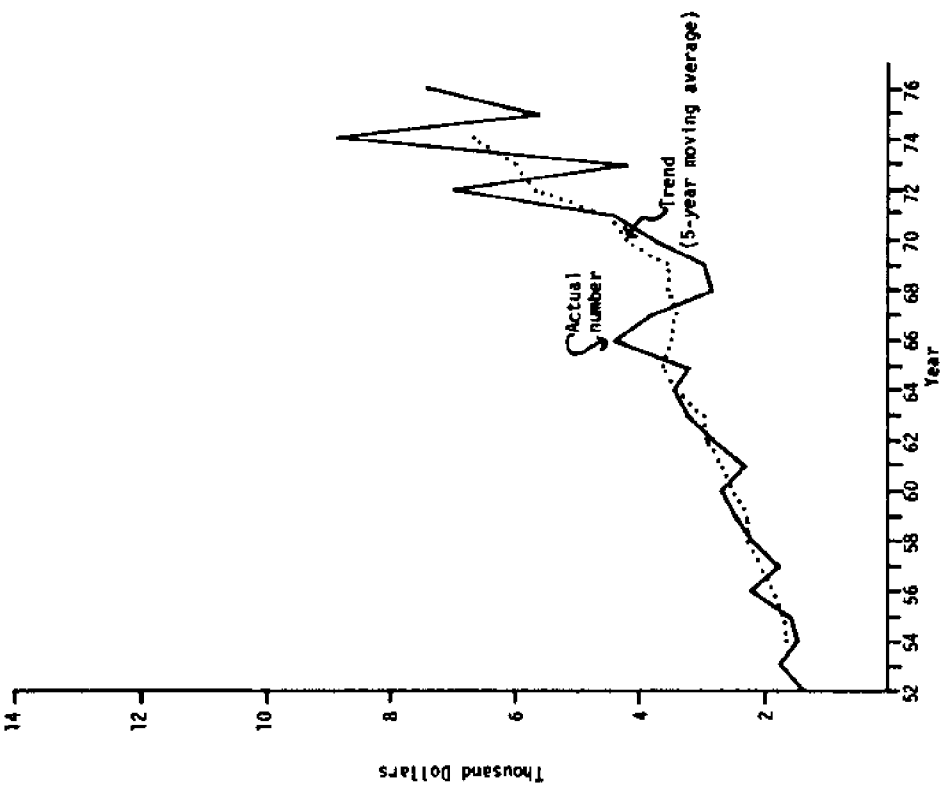


Figure 26.--Value of blue crabs landed per fisherman on the Florida east coast, 1952-76

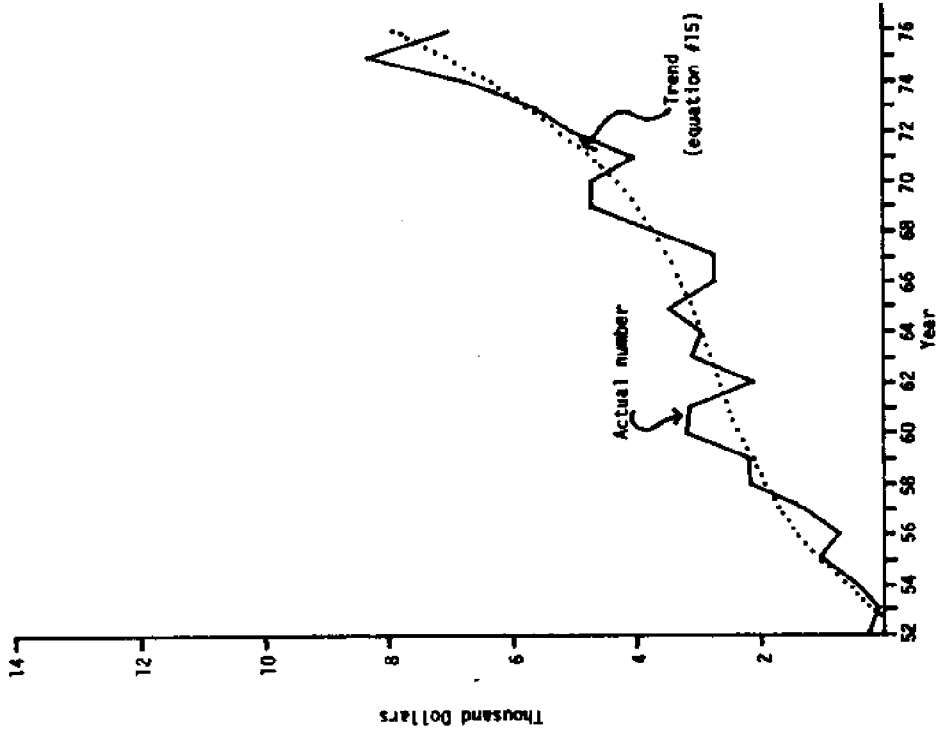


Figure 29. --Value of blue crabs landed per firm on the Florida west coast, 1952-76

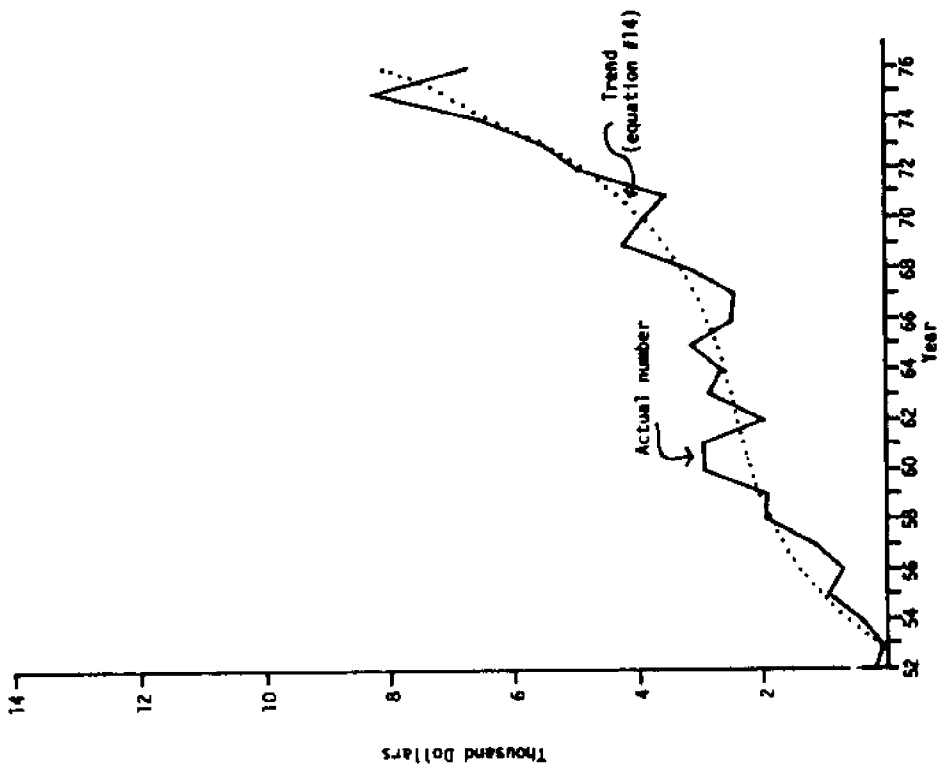


Figure 28. --Value of blue crabs landed per fisherman on the Florida west coast, 1952-76



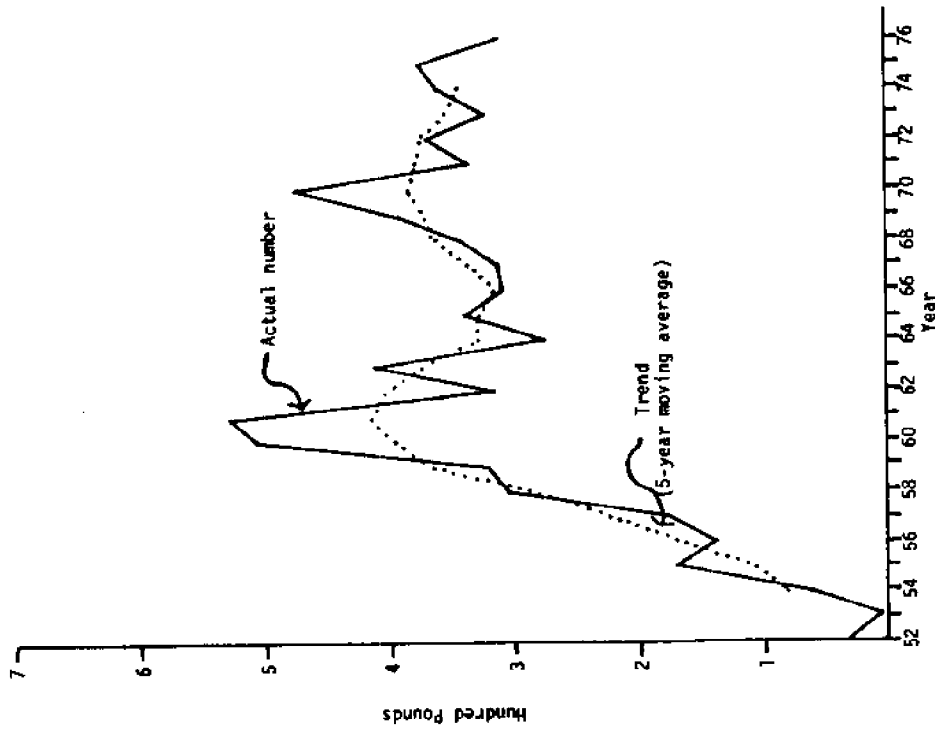


Figure 31.---Volume of blue crabs landed per trap on the Florida west coast, 1952-76

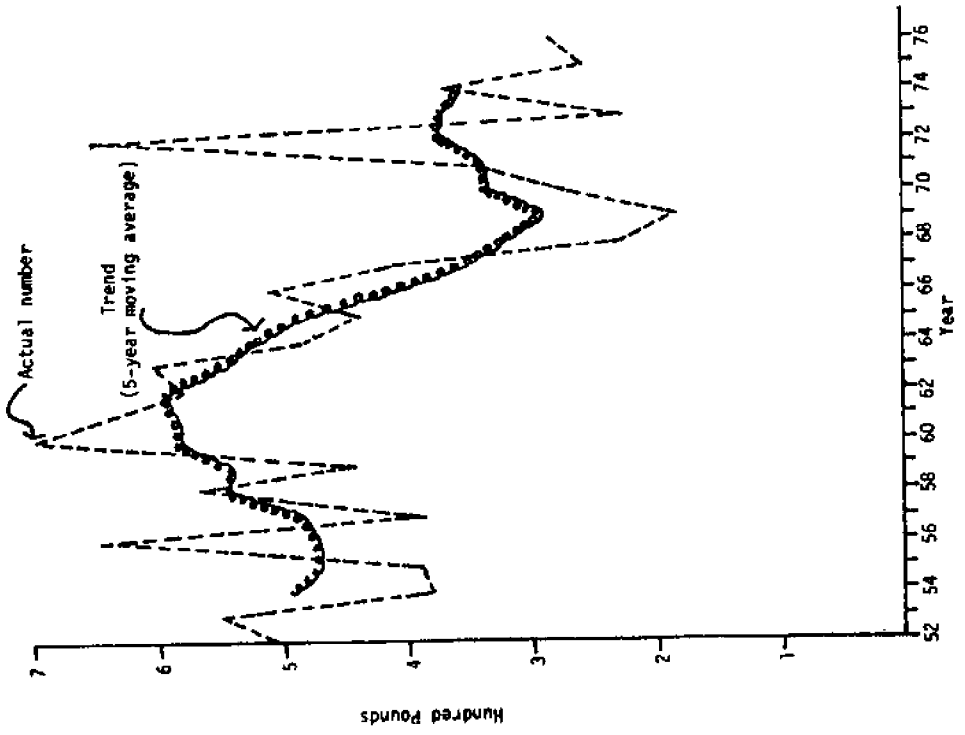


Figure 30.---Volume of blue crabs landed per trap on the Florida east coast, 1952-76

The estimated trend for value per trap of blue crabs on the west coast increased at a decreasing rate through 1965 (Figure 33). After 1965 the trend increased at a rapidly increasing rate which again was a result of increasing dockside prices during this period.

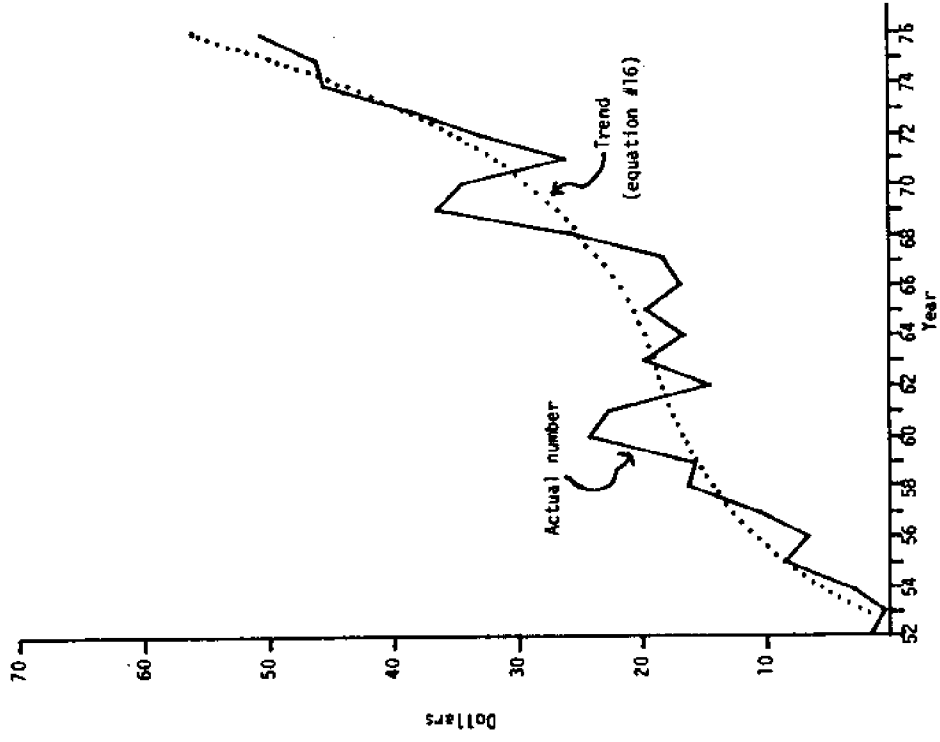


Figure 33.--Value of blue crabs landed per trap on the Florida west coast, 1952-76

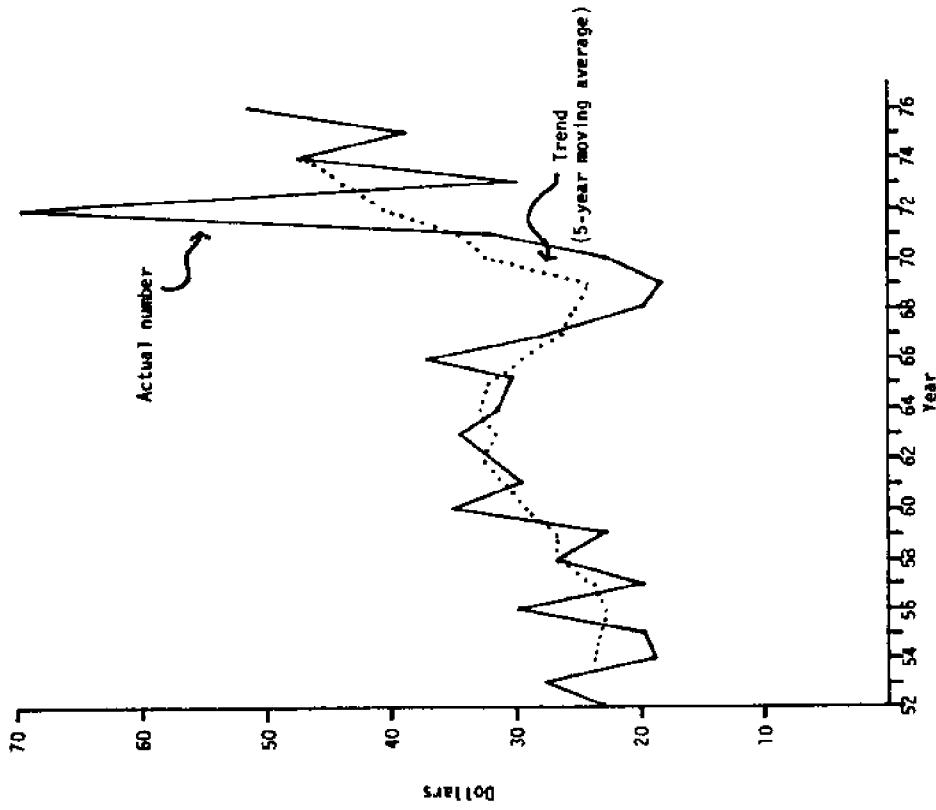


Figure 32.--Value of blue crabs landed per trap on the Florida east coast, 1952-76

## SUMMARY

Blue crab production in Florida ranked third in the U.S. in 1975 with an annual volume of approximately 17 million pounds and a value of \$2.2 million. Dockside prices have historically been higher for the total U.S. blue crab fishery, especially from 1971 to 1977. In terms of value the blue crab fishery in Florida has been a growing industry worth over one million annually at dockside since 1959. However, total Florida landings, cycling approximately every five years, have been on an overall declining trend since 1964. Increases in dockside prices have more than compensated for the overall decline volume. Price per pound increased 115 percent on the east coast and 123 percent on the west coast since 1970.

Major blue crab counties on the Florida east coast had a greater overall drop in landings than major west coast counties. However, both coasts showed a downward trend in landings after 1965. Landings analyzed on both coasts showed monthly landings decreasing throughout the study period, especially during the months of March to December. This further emphasized the overall yearly decline in Florida landings.

The number of regular fishermen (those earning 50 percent or more of their income from fishing) in Florida increased from 1953 through 1959 and from 1962 through 1966. The remaining years the number of regular fishermen decreased reaching a low of 235 fishermen in 1971. After 1966, the number of casual fishermen increased while the number of regular fishermen began decreasing. Blue crab fishermen are either becoming part-time fishermen and/or the value of their nonfishery income is increasing.

Firms were mostly made up of boats since only a limited number of vessels fished in Florida. Each boat is essentially a one man operation. Total number of Florida fishermen, firms and traps showed an overall upward trend through the mid-sixties. However, the trend has reversed itself and shows an overall decline since that time. The number of fishermen, firms and traps decreased on the east coast after 1969 and on the west coast after 1965.

Productivity in terms of the volume of blue crabs landed per fisherman showed an overall increase from 1970. Number of fishermen

decreased at a faster rate than volume of blue crabs landed. Both coasts show similar overall upward trends in productivity per fisherman. Productivity per trap decreased since 1962 but number of traps fished per fisherman increased enough to offset the declining catch per trap. Gross monetary returns to fishermen on both coasts increased rapidly due to increased dockside prices and increased productivity per fisherman since 1970.

In summary, total blue crab production in Florida declined on both coasts during the last several years. The number of fishermen, firms and traps have also declined. However, productivity per fisherman on both coasts increased during this time period. The reduction in number of fishermen was greater than the reduction in volume landed. However, the rapid increase in dockside prices is more than compensating for any decline in total volume of landings. Value per fisherman, firm and traps have been increasing due to increases in dockside prices.

## REFERENCES

- 1 Florida Department of Natural Resources. Summary of Florida Commercial Marine Landings, Tallahassee, Florida: 1952-1976.
- 2 Kmenta, Jan; Elements of Econometrics, New York. MacMillan Publishing Company, 1971.
- 3 National Marine Fisheries Service, "Florida Landings," monthly issues, U.S. Department of Commerce, Washington, D.C.
- 4 National Marine Fisheries Service, Fishery Statistics of the United States, U.S. Department of Commerce, Washington, D.C., 1952-1975.

## APPENDIX

Appendix Table 1.--Regression equations and summary of results

\*Estimated intercept and regression coefficients are presented for specified dependent variables regressed on years unless otherwise specified. T-Test values for each variable is located in parentheses.

Equation Number	Figure Number	Dependent Variable	Estimated Intercept	Estimated Coefficients					R <sup>2</sup>
				Year 1	Year 2	Year 3	Year 4	Year 5	
1	3	Quantity (Florida-trap)	-3,755,534.97 (-1.3705)	4,534,996.56 (5.2585)	-257,058.82 (-3.4982)	4,338.01 (2.4219)			.7855
2	3	Value (Florida-trap)	324,585.95 (1.4111)	-119,760.92 (-1.0574)	44,654.30 (2.6877)	-3,190.53 (-3.4915)	70.57 (4.993)		.9590
3	5	Quantity (East Coast)	3,998,282.00 (5.1645)	551,934.90 (4.0225)	-21,317.20 (-4.1612)				.4405
4	6	Value (East Coast)	102,648.13 (0.9125)	88,408.01 (1.5397)	-12,404.23 (-1.4196)	788.60 (1.5762)	-15.81 (-1.6553)		.8327
5	6	Value (West Coast)	-387,340.44 (-2.3894)	205,254.64 (3.8770)	-13,893.63 (-2.9670)	362.68 (3.0596)			.8929
6	11	Casual fishermen (Florida)	-35.29 (-0.7426)	29.35 (1.4533)	-4.58 (-1.6361)	0.30 (1.9074)	0.006 (-2.1359)		.7047
7	14	Fishermen (East Coast)	15.36 (0.3931)	115.62 (4.0977)	-25.99 (-4.0580)	2.34 (3.8350)	-0.09 (-3.5578)	0.001 (3.2647)	.6291
8	16	Traps (East Coast)	-7,844.49 (-1.0272)	15,916.86 (2.8851)	-3,662.37 (-2.9245)	343.61 (2.8777)	-13.72 (-2.7324)		.6249
9	17	Lbs./fishermen (Florida)	37,926.06 (3.0307)	-16,937.18 (-1.9400)	4,987.58 (2.6087)	-475.81 (-2.7081)	18.69 (2.6249)		.7425
10	18	Lbs./firm (Florida)	42,600.77 (3.3249)	-18,722.01 (-2.0944)	3,341.67 (2.7288)	-502.39 (-2.7928)	19.55 (2.6828)	-0.27 (-2.5183)	.7433
11	19	Dollars/fishermen (Florida)	1,364.12 (1.4833)	-333.08 (-0.7356)	102.81 (1.5478)	-7.52 (-2.0532)	0.18 (2.6423)		.9358
12	20	Dollars/firm (Florida)	1,532.26 (1.1768)	-371.80 (-0.8461)	109.00 (1.6904)	-7.80 (-2.1951)	0.18 (2.7665)		.9418
13	21	Dollars/trap (Florida)	4.96 (1.1315)	3,140.9 (3.1409)	-0.41 (-3.4546)	0.01 (4.4568)			.9112
14	28	Dollars/fishermen (West)	-19,857.65 (-2.1196)	12,666.03 (4.1398)	-744.14 (-2.7497)	14.16 (2.0671)			.7618
15	29	Dollars/firm (West)	-1,015.21 (-1.8007)	679.69 (3.6916)	-49.89 (-3.0636)	1.47 (3.5761)			.9299
16	33	Dollars/trap (West)	-5.94 (-1.4874)	4.62 (3.5444)	-0.32 (-2.7522)	0.01 (3.0922)			.9202



Appendix Table 2.--Total volume and value of blue crabs landed in traps and as residual catch,<sup>a</sup>  
Florida east and west coasts, 1954-74

	Trap Catch						Total	
	East			West			Value	Price
	Volume	Value	Price	Volume	Value	Price	Value	Price
	pounds	dollars	dollars	pounds	dollars	dollars	dollars	dollars
1952	3,492,000	157,141	0.045	134,600	6,057	0.045	163,198	0.045
1953	4,992,700	249,635	0.050	9,200	368	0.040	250,003	0.050
1954	6,031,700	301,585	0.050	1,045,000	52,258	0.050	353,835	0.050
1955	5,838,100	291,905	0.050	2,735,200	136,760	0.050	428,665	0.050
1956	7,496,100	344,075	0.046	2,489,800	119,001	0.048	463,076	0.046
1957	6,154,700	312,291	0.051	4,861,200	291,672	0.060	603,963	0.055
1958	7,985,600	372,838	0.047	7,798,600	413,328	0.053	786,166	0.050
1959	6,602,700	336,738	0.051	12,844,300	629,371	0.049	966,109	0.050
1960	6,945,800	347,290	0.050	17,342,800	832,453	0.048	1,179,743	0.049
1961	7,398,500	340,332	0.046	16,064,700	690,786	0.043	1,031,118	0.044
1962	7,755,500	426,552	0.055	10,072,900	473,425	0.047	899,980	0.050
1963	7,726,600	440,415	0.057	12,827,800	628,562	0.049	1,068,977	0.052
1964	6,563,700	422,848	0.064	13,625,800	816,142	0.060	1,238,990	0.061
1965	5,806,300	402,182	0.069	20,020,800	1,154,805	0.058	1,556,987	0.060
1966	7,152,500	519,784	0.073	16,310,800	900,236	0.055	1,420,020	0.060
1967	9,166,500	627,864	0.068	13,688,300	801,766	0.058	1,429,630	0.062
1968	6,413,000	553,769	0.086	8,865,300	665,765	0.075	1,219,534	0.080
1969	5,573,000	550,908	0.099	11,330,700	1,053,122	0.093	1,604,030	0.095
1970	7,633,300	638,739	0.084	14,670,000	1,066,942	0.073	1,705,681	0.076
1971	9,081,700	832,948	0.092	12,200,600	945,732	0.078	1,778,680	0.084
1972	6,237,500	677,217	0.108	10,453,800	938,440	0.090	1,615,657	0.097
1973	3,869,700	525,768	0.136	9,439,300	1,130,678	0.120	1,656,446	0.124
1974	7,431,700	963,296	0.130	10,064,700	1,271,638	0.126	2,234,934	0.128

Appendix Table 2.--Total volume and value of blue crabs landed in traps and as residual catch,<sup>a</sup>  
Florida east and west coasts, 1952-74--Continued

	Residual Catch						Total Value dollars	Price dollars
	East		West		Total			
	Volume pounds	Value dollars	Volume pounds	Value dollars	Volume pounds	Value dollars	Price dollars	
1952	2,657,200	119,574	1,849,500	83,228	4,506,700	202,802	0.045	
1953	1,334,000	66,708	3,144,200	125,768	4,478,200	192,476	0.043	
1954	895,600	44,780	1,857,900	92,895	2,753,500	137,675	0.050	
1955	1,844,800	92,240	2,218,900	110,945	4,063,700	203,185	0.050	
1956	533,100	25,387	1,238,300	60,676	1,791,400	86,063	0.048	
1957	378,000	19,180	440,400	26,424	818,400	45,604	0.056	
1958	10,900	491	894,800	47,424	905,700	47,915	0.053	
1959	9,900	505	1,051,100	51,504	1,061,000	52,009	0.049	
1960	16,300	815	1,305,500	62,564	1,321,800	63,479	0.048	
1961	87,100	4,006	1,064,800	45,787	1,151,900	49,793	0.043	
1962	113,100	6,221	283,400	13,320	396,500	19,541	0.049	
1963	868,600	49,510	320,600	15,711	1,189,200	65,221	0.055	
1964	387,100	24,775	442,700	26,562	829,800	51,337	0.062	
1965	156,900	8,143	575,400	29,577	732,300	37,720	0.052	
1966	170,500	8,938	234,700	11,420	405,200	20,358	0.050	
1967	152,900	6,286	285,500	14,706	438,400	20,992	0.048	
1968	202,300	13,512	138,300	7,764	340,600	21,276	0.062	
1969	151,100	6,178	245,800	20,346	396,900	26,524	0.067	
1970	145,200	12,651	100,500	7,674	245,700	20,325	0.083	
1971	50,500	4,640	78,100	6,274	128,600	10,914	0.085	
1972	50,000	5,675	219,400	20,295	269,400	25,970	0.096	
1973	44,000	6,236	159,200	16,261	203,200	22,497	0.111	
1974	40,000	6,127	69,000	8,812	109,000	14,939	0.137	

<sup>a</sup>Residual catch are crabs caught by equipment other than blue crab traps which include otter trawls, dip nets (common and drop), baited trot lines, stone crab and lobster traps.  
Source: Derived from [4].

