

DEL-SG-06-87

THE 1985 DELAWARE RECREATIONAL BOATING SURVEY:

AN ANALYSIS OF

DELAWARE-REGISTERED BOATERS

\$2.00

by

James M. Falk
Marine Recreation Specialist
Sea Grant Marine Advisory Service
University of Delaware

Alan R. Graefe
Assistant Professor
Dept. of Recreation and Parks
Pennsylvania State University

David G. Swartz
Economics Specialist
Sea Grant College Program
University of Maryland

February 1987

University of Delaware Sea Grant College Program
Newark, DE 19716

This publication is the result of research sponsored by NOAA Office of Sea Grant, Department of Commerce, under Grant No. NA85AA-D-SG033 (Project No. A/I-1), with supplemental support provided by the Delaware Department of Natural Resources and Environmental Control, Division of Fish and Wildlife. The U.S. Government is authorized to produce and distribute reprints for governmental purposes, notwithstanding any copyright notation that may appear hereon.

The University of Delaware Sea Grant College Program is supported cooperatively by the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, and by the State of Delaware.

TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	iv
LIST OF FIGURES	vi
EXECUTIVE SUMMARY	vii
ACKNOWLEDGMENTS	x
INTRODUCTION	1
RELATED STUDIES	2
OBJECTIVES	4
METHODS	4
RESULTS	8
Boat Owner Profile	8
Boater Characteristics	9
Boating Experience	16
Boating Motives	17
Boating Concerns	18
Boating Participation Patterns	19
Primary Boat Use	20
Use of Delaware Boating Resources	22
Boating Travel Patterns	25
Boating Safety	29
Safe Boating Practices	30
Boat Titling and Licensing	33
Role of the Delaware Boating Council	35
Boating and Weather	36
Access to Weather Information	36
Sources of Weather Reports	38
Spending Patterns	41
Annual Fixed Costs by Delaware-Registered Boaters	42
Daily Expenditures by Delaware-Registered Boaters	43
Total Spending by Delaware-Registered Boaters	44
Location of Spending	45
Fixed Costs and Daily Expenses by Facility Used.	49
Fixed Costs and Daily Expenses by Boat Size	50
CONCLUSIONS	53
REFERENCES	57
APPENDIX	58

LIST OF TABLES

	<u>Page</u>
Table 1. Questionnaire response	6
Table 2. Boat owner level of education by home residence . .	9
Table 3. Boat owner level of education by type of facility .	10
Table 4. Occupation of Delaware-registered boat owners . . .	11
Table 5. Boat owner occupation by home residence	12
Table 6. Boat owner occupation by type of facility	12
Table 7. Boat owner income by home residence	13
Table 8. Boat owner income by type of facility	14
Table 9. Type of area boaters live in by home residence . .	15
Table 10. Type of area boaters live in by type of facility used	15
Table 11. Boating experience by size of boat	16
Table 12. Boating motives by size of boat	18
Table 13. Boating concerns by size of boat	19
Table 14. Primary use of boat by home residence	20
Table 15. Primary use of boat by boat size	21
Table 16. Primary use of boat by type of facility	22
Table 17. Distribution of boating activity by water resource used	22
Table 18. Distribution of boating activity by home residence.	23
Table 19. Distribution of boating activity by size of boat .	24
Table 20. Distribution of boating activity by type of facility	25
Table 21. Boat slip location by home residence	26
Table 22. Home residence by boat slip location	27

List of Tables
(concluded)

	<u>Page</u>
Table 23. Destination of boat ramp use by home residence . . .	27
Table 24. Destination of boat ramp use by home residence . . .	29
Table 25. Percent of Delaware-registered boaters who familiarize themselves with Coast Guard regulations, receive Coast Guard Auxiliary or State of Delaware inspections, and who have taken a boating safety training course by home residence, boat size, and type of facility	31
Table 26. Percent of Delaware-registered boaters who favor titling laws and operator licenses by home residence, boat size, and type of facility . . .	34
Table 27. Percent of Delaware-registered boaters obtaining weather reports before boating, weather reports while boating, and perceiving access to weather information satisfactory by home residence, boat size, and type of facility	37
Table 28. Sources of weather reports by Delaware-registered boaters	39
Table 29. Sources of weather information used by Delaware-registered boaters by home residence, size of boat, and type of facility (includes those boaters who use weather information sources "regularly" and "sometimes").	40
Table 30. Annual fixed costs by Delaware-registered boaters .	43
Table 31. Daily expenditures by Delaware-registered boaters .	44
Table 32. Total estimated annual fixed costs (\$) of Delaware-registered boaters by location of spending	47
Table 33. Total estimated daily expenses (\$) by home residence and location of spending	48
Table 34. Average annual fixed costs and daily expenses by facility used	49
Table 35. Average annual fixed costs and daily expenses by boat size	51

LIST OF FIGURES

	<u>Page</u>
Figure 1. Map depicting Delaware Counties and major Delaware boating resources	7
Figure 2. Estimated total spending by Delaware-registered boaters in 1985	46

EXECUTIVE SUMMARY

This study examined a sample of boaters who had their boats registered in Delaware in 1985. The total number of boats registered for the year was 39,638. The state Boating Administration Office, located within the Department of Natural Resources and Environmental Control's Division of Fish and Wildlife provided a random sample of 1,300 boaters and their addresses from their computerized boat registration files.

The boaters selected in the sample were mailed a survey questionnaire during the first week of November, 1985. A 62% response rate was attained following a postcard reminder and follow-up mailing.

The average boater in the study had owned his or her present boat (in 1985) almost five years. They also had approximately 17 years of boating experience. Delaware-registered boaters were quite avid in their boating activity, participating an average of 34 days during the 1985 boating season. Twenty-two percent of the respondents favored passage of a boat titling law in Delaware and 42% favored licensing all boat operators.

Eighty-five percent of the responding boaters had at least a high school education. Thirty-five percent were white-collar employees (professional/administrative positions), 31% were blue-collar workers (craftsmen, skilled or semi-skilled workers) and 20% were retired individuals. Sixty-four percent of the boaters had family incomes greater than \$30,000. Sixty-six percent of the respondents lived in rural areas or in small towns and villages with fewer than 20,000 people.

Two Delaware water bodies were the most popular boating areas for responding boaters. Fifty-five percent of the boaters mentioned that they had boated in Delaware's inland bays during 1985, and 54% noted that Delaware Bay was a water body where they spent time boating. Additionally, the Atlantic Ocean was used as a boating resource by 30% of Delaware-registered boaters.

Overwhelmingly, fishing (61%) was the primary activity engaged in by boaters. This was followed by pleasure cruising (18%) and a very small percentage (3%) stated that water skiing was their primary boating activity.

Delaware-registered boaters identified three major motives, in decreasing order of importance, as reasons for boating: to be outdoors in a natural environment; that boating is a relaxing activity; and to be with friends or family members. Additionally, boaters reported that there were no major concerns that affected their boating enjoyment. However, the three most mentioned concerns, in decreasing order, were: that commercial fishermen catch all the fish; that there are too many other boats on the water; and that boating is becoming too costly.

For the most part, boaters in the study revealed that they were quite safety conscious when it came to boating. Eighty-one percent of the respondents noted that they familiarize themselves with Coast Guard regulations each year. Approximately 52% percent indicated that they had taken a safe boating course.

Ninety-two percent said that their access to weather information was satisfactory and approximately 98% obtained weather reports before boating. Another two-thirds reported obtaining weather reports while out on the water. The two most often used sources of weather information by responding boaters were F.M. commercial radio (85%) and A.M. commercial radio (84%).

The average Delaware-registered boater spent approximately \$902 on fixed costs (insurance, repair and maintenance, docking fees, etc.) for his boat in 1985. In addition, these boaters spent an average of \$59.40 per boating trip (34 average) on such items as boat gas, bait and tackle, and snacks.

When these average spending costs were calculated for the entire population of Delaware-registered boaters in 1985, a significant total emerged. Total spending for annual fixed cost items approximated \$36 million and total spending for daily purchases exceeded \$80 million. Thus, the total spending by Delaware-registered boaters in 1985 totaled almost \$116 million.

Of the total \$116 million spent by Delaware-registered boaters in 1985, approximately 28% or \$32 million was spent at out-of-state locations. The remainder was spent in the three Delaware counties--New Castle (\$16 million), Kent (\$29 million) and Sussex (\$39 million).

When annual fixed cost spending (\$36 million) was analyzed alone, approximately 35% or in excess of \$12.6 million, was spent at out-of-state locations. Sussex County was the location for 40%, or \$14.3 million of fixed cost spending, followed by New Castle County at 18% (\$6.4 million), and Kent County at 7% (\$2.4 million).

Total daily boating expenses amounted to more than \$80 million. When the location of this spending was analyzed, a different pattern emerged. The amount of spending was greatest in Kent County for a total of \$26.6 million or 33% of the total daily expense spending. Following closely was Sussex County with \$24.7 million or 31% of total daily expense spending. Out-of-state locations accounted for 24% or \$19.5 million in spending, and New Castle County had an estimated \$9.3 million (12%) in daily spending in 1985.

ACKNOWLEDGEMENTS

This study was conducted by the University of Delaware Sea Grant Marine Advisory Service through the support of the University's Sea Grant College Program and the Department of Natural Resources and Environmental Control's Division of Fish and Wildlife.

A number of individuals deserve mention for their contributions to this report. First and foremost we would like to thank George Stewart, State Boating Administrator with the Division of Fish and Wildlife, for seeing the need for this study and agreeing to provide financial support.

We are appreciative of the assistance provided by the Marine Advisory Service staff and graduate student, Susan H. Sennett, for aiding in the mail-out of more than 1,300 survey questionnaires.

Patricia W. Salevan and June Rose Fatcher deserve special mention for the long tedious hours they put in coding the responses from more than 750 completed questionnaires.

We would like to also thank Barbara Porter for volunteering her services to review the many written comments we received from boaters and organizing them into a useful fashion.

Andrew C. Frake, Computer Programmer/Analyst with the University's Academic Computing Services, was especially helpful as we developed the computer program necessary to analyze the multitude of collected data.

We are also appreciative of the assistance provided by Pam Donnelly of the College of Marine Studies for her graphics support, Elizabeth Macalaster for editing the manuscript, and, most importantly, we would like to extend a warm thank-you to April Beauchamp for typing the report.

Finally, we would like to thank the boaters who took the time to respond to the survey. Their responses should be useful to both public officials and private sector groups to better serve their needs.

INTRODUCTION

Recreational boating is one of the nation's most popular outdoor recreation activities. The U.S. Coast Guard and the boating industry estimate that about 25% of the population in the United States participates in boating (Collins and Sedgwick, 1979; Marmo, 1980).

Delaware is no exception when boating activity is measured. The number of registered boats in the state continues to grow each year. According to the Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Fish and Wildlife, the number of Delaware-registered boats increased from 24,557 in 1975 to more than 39,000 in 1985. Throughout the state, boating facilities and services provide for the many thousands of boaters who use the state's tidal and fresh waters for cruising, fishing, sailing, and other uses.

This report examines responses from a random sample of boaters who registered their boats in the state during the 1985 boating season. Survey questionnaires were mailed to this sample to determine the extent of their boating activity, yearly spending habits, certain sociological characteristics, concerns that affect their boating satisfaction, and information on boating safety and education.

The study was conducted to provide information to many groups. Boating use statistics can provide accurate information to public sector officials who are responsible for managing and planning for recreational boating. Survey results on boating safety and education will help groups who provide these services to better respond to boaters' needs. The demographic information can be used by boating trade association members and individual boating businessmen to better identify and serve their targeted markets. The economic information provides an estimate of spending associated with boating activity in Delaware for 1985. The magnitude of these expenditures to the state should be taken into account as policies affecting recreational boating activity are considered.

RELATED STUDIES

To date, little research exists that directly examines Delaware-registered boaters and their boating activity in the state. The DNREC, Division of Fish and Wildlife, has surveyed registered boaters in the past to obtain economic information, location of boating activity, information on safety, and other input to consider in developing boating policies. The last survey of this nature, however, was conducted in 1976.

Researchers in a number of states have examined various issues related to recreational boating. A large portion of the boating literature is comprised of reports of surveys of recreational boat owners.

Rorholm (1976) surveyed recreational boat owners in Rhode Island who boated in the state during the 1973 season. He found that 35% of his sample consisted of "white-collar" employees (e.g. professionals, managers, administrators) and 34% were "blue-collar" employees (e.g. craftsmen, laborers). Nearly one-half of the boating activity by boaters owning powerboats was spent fishing. Day-trips and day-sailing ranked second with about 28% of the total.

He also found that Rhode Island boaters spent considerable amounts of money during the year on boating. It ranged from a low of \$319 per year for the average outboard powerboat to a high of \$1,930 per year for the average inboard-powered sailboat. Forty-eight percent of sailboat owners noted that they would like to own a larger sailboat within five years' time. Forty-eight percent of power boat owners noted that they would like to keep the same type of boat that they currently own.

Noden and Brown (1977) surveyed 4,833 boat owners who had their boats registered in New York state during 1971. They attained a 57% response rate after three follow-up reminders. The authors found that the average annual boat usage in 1973 was 41 days. This represented about 46 million boater days. Pleasure cruising and sport fishing accounted for 83% of all boating activity.

Additional results noted that, statewide, the average annual expense of operating and maintaining a boat was \$151 for boats under 16 feet, \$482 for boats between 16 feet and 26 feet and \$1,542 for boats over 26 feet. In addition, New York boat owners reported on the major problems that they associated with recreational boating. In decreasing order of importance, inconsiderate boaters, crowded facilities, and polluted water were the major problems faced by recreational boaters in 1973.

Western Oregon boaters were surveyed by Vars (1979) in November of 1977. Almost 2,400 boaters responded to a mail survey. Results revealed that saltwater and freshwater/saltwater boaters owned their boats, on the average, for 15 years. In addition, three of every four Oregon boaters indicated that family members accompanied them on boating trips "very often" or "quite often." The most popular activity among western Oregon boaters was fishing. The average saltwater boater spent almost 29 days fishing in 1977. The study also reported that the average expense for saltwater boaters in 1977 was \$927; for freshwater boaters, \$334; and for boaters who boated in both fresh and saltwater, \$695.

Stynes, et al. (1983) mailed 2,520 survey questionnaires to Michigan-registered boaters during the 1981 boating season to estimate spending patterns and the economic impacts of boating. Multiple mailings provided a return rate of nearly 67%. The findings revealed that Michigan-registered boaters spent over \$1 billion on boating in 1981. The average Michigan boat owner spent \$469 a year on craft-related purchases and about \$39 per day on 33 days of boating each year. This amounted to an average of \$1,787 spent per boater per year. Food (28%), equipment (21%) and boat fuel (18%) made up the largest proportions of Michigan boat owner's budget.

Graefe (1985) studied the characteristics, participation patterns, and expenditures of registered boaters in Maryland during 1983. His study focused on comparing these variables across different categories of boats, such as boats kept in the water versus trailered boats, boats using different types of facilities,

and boats using different geographic areas and resources. Results showed that annual fixed costs for inwater boats (\$1,643) were nearly triple those for trailered boats (\$579). Maryland boaters also reported spending an average of \$43 (trailered boats) to \$51 (inwater boats) per day for daily boating expenses like fuel, launch fees, food and beverages, and bait and tackle. The study estimated the total spending for boating-related fixed costs and daily expenses during 1983 to be \$400 million.

Studies like these collectively provide a strong data base related to boating demand, including the characteristics, spending, attitudes and participation patterns of recreational boaters. In addition, many of these studies include comparisons of these variables across selected classifications of boaters, such as type of boat (power versus sail) and size of boat (Graefe, 1986).

OBJECTIVES

1. To present demographic information on Delaware-registered boaters, their motivations for boating, and their concerns with boating in Delaware.
2. To describe the nature and extent of boating activity by Delaware-registered boaters.
3. To discuss elements of boating safety and education.
4. To document yearly and per-trip spending by boaters during 1985.

METHODS

Information for this study was collected through a mail survey of Delaware-registered boaters who had their boats registered in the state during 1985. The total number of boats registered for the year was 39,638. The state Boating Administration Office, located within DNREC's Division of Fish and Wildlife, provided a random sample of 1,300 boaters and their addresses from their computerized boat registration files.

The boaters selected in the sample were mailed a survey questionnaire during the first week of November 1985--a time when most recreational boaters have completed their boating season. The materials sent included a questionnaire, a cover letter describing the intent of the survey and a postage-paid return envelope. (See appendix.) Two and one-half weeks after the initial survey mailing, postcard reminders were sent to those boaters who had not returned the original questionnaire, and about two and one-half weeks later, a second complete questionnaire and cover letter were mailed to those who still had not responded. All survey materials were mailed first class.

Of the 1,300 questionnaires mailed, 62% were returned in usable form (Table 1). This response rate and the size of the sample eliminated the need for a detailed follow-up to check non-response bias, since it is unlikely that overall study findings would change as a result of adding information on nonrespondents.

The sample of 1,300 registered boaters (selected from a population of 39,638 registered boaters) amounted to approximately 3% of the total population of registered boats in the state in 1985. There was no attempt to stratify the sample by boat size or any other variable. However, when the randomly selected sample of boaters was examined, the breakdown by boat size was nearly identical to that for the actual population of registered boats.

To further understand the accuracy of frequency distributions and population estimates in this report, it is necessary to consider the number of cases on which the particular findings are based. As a general rule, the larger the sample, the more likely that the results are a true representation of the population from which the sample was selected. A rule of thumb for interpreting results based on the number of respondents in this study would be to accept with 95% confidence that the results for the sample are within about 5% above or below the true population values.

Table 1. Questionnaire response.

	Number	Percent
Original Sample Size	1,300	100
Nondeliverable	89	
Effective Sample Size	1,211	
Received	762	
Incomplete	11	
Usable	751	62

The responses from the 751 usable questionnaires were coded and entered into the University of Delaware's IBM mainframe computer. The SPSSX (statistical package for the social sciences) computer program was utilized to analyze the coded data.

The data were analyzed in a number of different ways. Initially, total frequency responses were obtained. These frequencies report the responses in the survey for the entire sample of boaters. In addition, various cross tabulations were performed in order to distinguish how different boaters responded to the same question.

In this report, three major classification variables were identified for comparative analysis. The first one distinguished boaters by their home residence. The three Delaware counties were noted (New Castle, Kent, and Sussex) (Figure 1), two adjoining states (Pennsylvania and Maryland) were singled out, and a final category included residents of any other state (primarily New Jersey, New York, and Virginia). Maryland and Pennsylvania boaters were identified separately since the numbers of boaters residing in these states were large enough for comparisons to be made with Delaware boaters. The "home" residence of boaters was determined based on the address provided to the DNREC, Division of Fish and Wildlife when boats

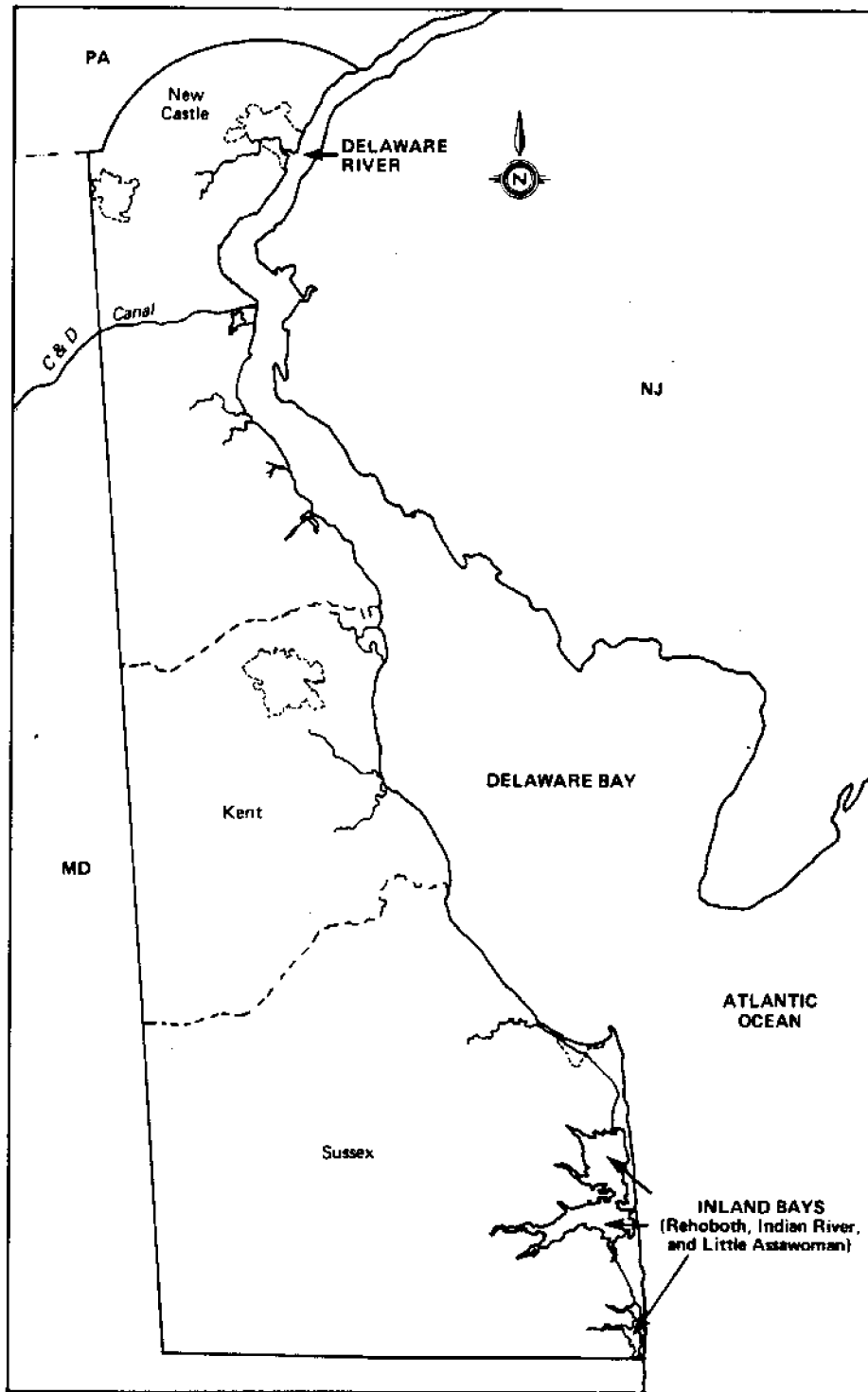


Figure 1. Map depicting Delaware counties and major Delaware boating resources.

were registered.¹ It is conceivable that boaters with a home residence outside of Delaware could also maintain a residence in Delaware.

The second classification variable that was examined was size of the boat selected in the sample. Three size categories were identified. They correspond to U.S. Coast Guard classifications as reported in Coast Guard safety statistics, and are generally recognized as standard size categories to examine boat use. The classifications include boats less than 16 feet; 16 feet to 25 feet; and 26 feet and greater.

The third classification variable that was selected included the types of facilities that boaters primarily used. Though boaters could use more than one facility type during the course of a year, each was assigned only one type based on the type of facility used most frequently. The facility types that were identified included two categories for inwater boats (marinas and private docks) and launch ramps for trailered boats.

RESULTS

Boat Owner Profile

This section provides a description of the individuals who registered their boats in Delaware during 1985. This description focuses on the boaters' socio-economic characteristics, experience, motivations, and concerns. Where significant differences were found with respect to boaters' place of residence, boat size, or type of facility used, tables have been included to demonstrate these differences.

¹Chapter 21, Subchapter II, Title 23 of the Delaware Code states the following with regard to boat registrations. §2113(c) Licensing and Registration Fees. Non-resident vessels using the waters of this state for principal use over sixty days and non-residents owning a boat docked and/or stowed in waters of this state for over sixty days should be required to register with the department (Department of Natural Resources and Environmental Control).

Boater Characteristics

Delaware-registered boaters reported a wide spectrum of formal education levels (Table 2). While 15% of all boaters had less than a high school education, nearly 61% reported some formal education beyond the high school level. Boaters from other states were the most likely to be college graduates (58%). Users of marinas and private docks were significantly more likely than owners of trailered boats to have higher levels of formal education (Table 3).

Table 2. Boat owner level of education by home residence.

Level of Education	Home Residence						
	All Boaters n=744	Delaware			Out-of-State		
		New Castle n=193	Kent n=61	Sussex n=157	PA n=254	MD n=48	Other n=31
Grade School	4%	2%	7%	6%	3%	4%	3%
Some High School	11	8	7	15	11	10	3
Graduate High School	26	27	18	27	30	23	10
Tech./Voc. School	13	15	16	8	16	15	3
Some College	21	19	26	22	20	27	19
Associate Degree	6	8	10	5	5	0	3
Bachelor's Degree	10	11	10	11	7	8	39
Graduate School	9	10	7	5	9	13	19

Table 3. Boat owner level of education by type of facility.

Level of Education	Type of Facility			
	All Boaters n=744	Marina n=180	Private Dock n=114	Launch Ramp n=449
Grade School	4%	2%	3%	5%
Some High School	11	9	12	11
Graduate High School	26	22	33	26
Tech./Voc. School	13	13	6	16
Some College	21	20	20	22
Associate Degree	6	8	3	6
Bachelor's Degree	10	14	14	8
Graduate School	9	12	10	8

About one-third of the registered boaters held professional or administrative occupations, while nearly another one-third held "blue collar" jobs (Table 4). It is noteworthy that nearly 20% of the sample of boat owners were retired. Tables 5 and 6 examine boaters' general occupation categories in relation to primary home residence and type of facility used. Boaters residing in Kent and Sussex Counties were least likely to hold professional/administrative positions (Table 5). Boaters who trailered their boats to launch ramps were more likely to work in a blue collar occupation and less likely to be retired than users of either marinas or private docks (Table 6).

Table 4. Occupation of Delaware-registered boat owners.

Occupation Category	Frequency	Percent
<u>Professional/Administrative</u>		
Professional	169	25.0
Manager/Supervisor	<u>69</u>	<u>10.2</u>
Subtotal	238	35.2
<u>Clerical/Sales</u>		
Clerical	16	2.4
Sales	<u>25</u>	<u>3.7</u>
Subtotal	41	6.1
<u>Blue Collar</u>		
Craftsman/Foreman	20	3.0
Skilled/Semi-Skilled	139	20.6
Manual Labor	46	6.8
Farmer	<u>3</u>	<u>0.4</u>
Subtotal	208	30.8
<u>Miscellaneous/Self-Employed</u>		
Military	3	0.4
Student	4	0.6
Housewife	2	0.3
Self-Employed	<u>47</u>	<u>7.0</u>
Subtotal	56	8.3
<u>Retired</u>	131	19.4
TOTAL	674	99.8%

Table 5. Boat owner occupation by home residence.

Occupation Category	Home Residence						
	All Boaters n=674	Delaware			Out-of-State		
		New Castle n=172	Kent n=56	Sussex n=142	PA n=231	MD n=44	Other n=29
Professional/ Administrative	35%	38%	27%	28%	36%	39%	62%
Clerical/Sales	6	6	9	1	7	7	17
Blue Collar	31	36	32	28	36	14	3
Miscellaneous/ Self-Employed	8	5	11	10	9	11	3
Retired	19	16	21	32	13	30	14

Table 6. Boat owner occupation by type of facility.

Occupation Category	Type of Facility			
	All Boaters n=674	Marina n=158	Private Dock n=106	Launch Ramp n=409
Professional/ Administrative	35%	39%	31%	35%
Clerical Sales	6	6	7	6
Blue Collar	31	21	26	36
Miscellaneous/ Self-Employed	8	10	8	8
Retired	19	23	29	15

As was the case for education, boaters cover a wide range of income levels. About 16% reported incomes lower than \$20,000 and less than 10% reported incomes above \$75,000 (Table 7). The overall sample of registered boaters was fairly evenly distributed in between these extremes. Boaters with primary residences outside of Delaware tended to report somewhat higher income levels (Table 7). Similarly, users of in-water facilities (marinas and private docks) tended to report higher incomes than owners of boats trailered to launch ramps (Table 8).

Table 7. Boat owner income by home residence.

Income Level	Home Residence						
	All Boaters n=690	Delaware			Out-of-State		
		New Castle n=182	Kent n=58	Sussex n=147	PA n=231	MD n=43	Other n=29
Under \$10,000	3%	2%	10%	5%	2%	5%	0%
\$10,000-19,999	13	14	12	24	8	7	0
\$20,000-29,999	20	20	31	22	17	19	7
\$30,000-39,999	22	20	16	22	28	9	10
\$40,000-49,999	19	18	19	14	20	30	21
\$50,000-74,999	16	18	10	7	17	26	48
\$75,000-99,999	4	4	0	3	4	2	7
\$100,00 & above	3	4	2	3	4	2	7

Table 8. Boat owner income by type of facility.

Income Level	Type of Facility			
	All Boaters n=690	Marina n=167	Private Dock n=104	Launch Ramp n=418
Under \$10,000	3%	2%	4%	4%
\$10,000-19,999	13	14	10	14
\$20,000-29,999	20	17	17	21
\$30,000-39,999	22	13	24	25
\$40,000-49,999	19	18	15	20
\$50,000-74,999	16	23	16	14
\$75,000-99,999	4	6	9	1
\$100,000 & above	3	7	5	1

A large portion (37%) of Delaware-registered boaters live in rural areas, while relatively few live in urban or metropolitan areas (Table 9). The type of area boaters live in varied according to the county or state of residence and type of facility used. Rural settings or small villages and towns were most typical for boaters from Kent and Sussex Counties and Pennsylvania (Table 9). Urban home environments were much more typical for boaters from New Castle County, Maryland, or other states. Owners of trailered boats were most likely to live in rural areas and least likely to come from urban or metropolitan areas (Table 10).

Table 9. Type of area boaters live in by home residence.

Type of Area	Home Residence						
	All Boaters n=734	Delaware			Out-of-State		
		New Castle n=186	Kent n=61	Sussex n=159	PA n=252	MD n=46	Other n=30
Rural	37%	20%	49%	61%	34%	30%	20%
Village/Town Under 20,000	29	22	31	34	32	28	23
City of 20,000-99,999	14	21	20	1	14	9	30
Urban Area, 100,000-250,000	14	33	0	3	10	13	13
Metropolitan Area, Over 250,000	6	4	0	1	9	20	13

Table 10. Type of area boaters live in by type of facility used.

Type of Area	Type of Facility			
	All Boaters n=734	Marina n=176	Private Dock n=113	Launch Ramp n=444
Rural	37%	31%	34%	40%
Village/Town Under 20,000	29	33	31	28
City of 20,000-99,999	14	12	11	15
Urban Area, 100,000-250,000	14	14	19	12
Metropolitan Area, Over 250,000	6	10	5	5

Boating Experience

This section considers Delaware boaters' overall experience with recreational boating and with the boats they currently own. There were no significant relationships between boaters' home residence and the number of years boaters had owned their current boat or in their total years of participation in boating. Previous boating experience was most likely to be related to the size of one's boat (Table 11). All boaters reported that they had owned their current boats for an average of nearly five years. However, boaters with boats above 25 feet in length owned their boats the shortest time (3.5 years), while individuals with boats under 16 feet owned their boats the longest time (5.9 years).

Most boaters in the sample had participated in boating many years longer than they had owned their current boat. The average number of years of total boating experience was about 17 years (Table 11). Boaters currently owning larger boats reported greater total experience than those owning smaller boats, although these differences were not significant statistically.

Table 11. Boating experience by size of boat.

Boating Experience Variables	Boat Size (feet)			
	All Boaters n=742	<16 n=210	16-25 n=482	>25 n=50
Number of Years Owned Boat*	4.7	5.9	4.4	3.5
Number of Years' Boating Experience	17.1	16.1	17.2	19.5
Type of Boat Respondent Plans to Own Five Years Later*				
Larger	40%	43%	39%	48%
Smaller	2	1	2	7
Same Size	53	53	54	41
Other	5	3	6	4
Days Participated (1985)*	34	32	33	54

*Differences significant at .05 level.

Boaters were also asked what size boat they planned to own five years from now. About half of the respondents indicated they would own the same size boat (Table 11). Among those anticipating a change, nearly all expected to purchase a larger boat. Boaters currently owning boats at least 26 feet in length were the least likely to report that they would own the same size boat five years later. Nearly half of these boaters (48%) indicated they would own a still larger boat, while 7% reported that they expected to own a smaller boat.

Current level of participation in boating also varied in relation to the size of boat owned. All boaters sampled reported that they had spent an average of 34 days boating during the 1985 boating season (Table 11). Individuals owning the largest boats (above 25 feet) reported the greatest levels of participation (an average of 54 days compared to 32-33 days for those owning boats less than 25 feet in length).

Boating Motives

Boaters in this study were asked how important a series of items were to them as reasons for going boating. While there were few significant differences in motives between boaters living in different areas or using different types of facilities, the importance of several possible reasons for boating varied by size of boat owned (Table 12). "To be outdoors in a natural environment" was the most important reason for boating, regardless of size of boat owned. "Relaxation" and "being with friends or family" were nearly as important to boaters, especially those owning the largest boats. "Competition" and the "challenge of boating" seemed to be the least important motives for boating, although owners of large boats attached more importance to the challenge of boating than owners of smaller boats. Only one motive was less important to owners of boats greater than 25 feet in length; the desire to use the boat for fishing was significantly more important to boaters with boats less than 26 feet than those with larger boats.

Table 12. Boating motives by size of boat.

Motive**	Boat Size (feet)			
	All Boaters n=712	<16 n=197	16-25 n=467	>25 n=48
To be Outdoors in Natural Environment	4.4	4.4	4.3	4.5
Boating is Relaxing*	4.1	3.9	4.1	4.3
To be with Friends or Family*	3.9	3.8	4.0	4.1
I Like the Variety of Boating*	3.6	3.4	3.7	3.8
I Need a Boat to Get to Fish*	3.5	3.6	3.6	2.7
Boating is a Healthy Sport*	3.4	3.2	3.5	3.5
To Get Away from Others	3.2	3.2	3.2	3.5
Experience Challenge of Boating*	2.6	2.2	2.7	3.2
I Like the Excitement of Competition	2.1	2.0	2.2	2.3

* Differences significant at .05 level.

**Values given are mean scores from a scale ranging from not important (1) to extremely important (5).

Boating Concerns

Boaters were also given a list of potential boating concerns and asked the extent to which each concern had affected their boating activity. Most boaters reported that none of the potential concerns had even moderately affected them (Table 13). Competition with commercial fishermen for sportfish seemed to be the most important of the concerns listed, followed closely by perceptions that there are too many boats and that boating is getting too costly. But, even though these concerns were greater than the others listed, it is important to note that they had little or no effect on most boaters' activities. Potential concerns about commercial shipping and navigation and the number of boating rules and regulations were the least important concerns of Delaware-registered boaters.

As in the case of boating motives, there were some notable differences in the concerns of owners of different size boats

(Table 13). Concern over the costs of boating and the availability of places to dock one's boat increased with size of boat owned. Conversely, concerns about commercial fishermen and the number of other sportfishermen were greater among those owning smaller boats, as was the degree of concern about not enough launching facilities.

Table 13. Boating concerns by size of boat.

Boating Concerns**	Boat Size (feet)			
	All Boaters n=684	<16 n=195	16-25 n=445	>25 n=44
Commercial Fishermen Catch				
All the Fish*	2.8	2.6	2.9	2.2
Too Many Boats	2.7	2.6	2.7	2.4
Boating is Getting Too Costly*	2.7	2.4	2.8	2.9
Not Enough Launching Facilities*	2.3	2.2	2.5	1.6
Too Few Places to Dock Boat*	2.2	1.8	2.3	2.7
Environmental Problems	2.2	2.2	2.3	2.3
Too Many Other Sportfishermen*	2.0	1.9	2.0	1.5
Too Many Rules and Regulations	1.8	1.7	1.8	1.8
Commercial Shipping Causes				
Navigation Problems	1.5	1.4	1.5	1.7

* Differences significant at .05 level.

**Values given are mean scores from a scale ranging from no effect on my boating activity (1) to great effect on my boating activity (5).

Boating Participation Patterns

This section examines how Delaware-registered boaters use their boats. The information presented focuses on the activities boaters participate in, the locations of their boating activity, and their travel patterns. Boating participation patterns differed significantly in relation to each of the study's major classification variables (boater's primary residence, size of boat, and type of facility used). Hence, this section presents comparative tables for each of the classification variables.

Primary Boat Use

Fishing was by far the dominant use of boats by Delaware boaters (Table 14). About three-fifths of all boaters sampled reported that fishing was the primary use of their boat. Boaters residing in Sussex County were the most likely to state that fishing was their primary boating activity (72%), while boaters from Maryland (48%) and other states (41%) (except Pennsylvania) were least likely to use their boats primarily for fishing. Sixty-three percent of Pennsylvanians with boats registered in Delaware reported that fishing was the primary use of their boat.

Pleasure cruising was the second-most popular boating activity. Boaters from New Castle County were more likely than those living in Kent or Sussex County to report pleasure cruising as their primary boat use. Out-of-state boaters, particularly those from Maryland (33%), were even more likely to participate primarily in pleasure cruising.

Very few boaters reported any other activities as their primary boat use. Racing, diving, and overnight cruising were each reported as a primary boat use by 1% or less of the boaters sampled. Water skiing was slightly more popular, accounting for the primary use of about 3% of all boats in the study.

Table 14. Primary use of boat by home residence.

Primary Boat Use	Home Residence						
	All Boaters n=749	Delaware			Out-of-State		
		New Castle n=193	Kent n=61	Sussex n=160	PA n=255	MD n=48	Other n=32
Fishing	61%	59%	59%	72%	63%	48%	41%
Pleasure Cruising	18	21	12	11	18	33	25
Water Skiing	3	4	5	2	3	0	3
Day Sailing	2	2	0	1	2	2	6
Overnight Cruising	1	0	0	0	1	0	3
Racing	1	1	0	0	0	0	6
Diving	0	0	0	0	0	2	0
Activity Combinations	14	13	24	14	13	15	16

Primary boat use also varied in relation to size of boat owned (Table 15). Pleasure cruising replaced fishing as the dominant activity for those boaters owning boats longer than 25 feet. Differences between the two smaller boat categories were relatively small in comparison, and fishing remained dominant for boaters with 16-25 foot boats, as well as those owning boats less than 16 feet in length.

Table 15. Primary use of boat by boat size.

Primary Boat Use	Boat Size (feet)			
	All Boaters n=749	<16 n=212	16-25 n=487	>25 n=50
Fishing	61%	70%	62%	22%
Pleasure Cruising	18	8	18	58
Water Skiing	3	2	4	0
Day Sailing	2	2	1	2
Overnight Cruising	1	0	0	4
Racing	1	0	0	4
Diving	0	0	0	0
Activity Combinations	14	18	15	10

Boats using different types of facilities also were used differently (Table 16). Trailered boats were more likely (67%) to be used primarily for fishing than boats kept in the water at either marinas (51%) or private docks (53%). It is noteworthy, however, that the majority of inwater boats were also used primarily for fishing. Conversely, trailered boats were least likely to be used primarily for pleasure cruising (12%), while boats kept at marinas were most likely to be used for pleasure cruising (31%).

Table 16. Primary use of boat by type of facility.

Primary Boat Use	Type of Facility			
	All Boaters n=749	Marina n=180	Private Dock n=116	Launch Ramp n=452
Fishing	61%	51%	53%	67%
Pleasure Cruising	18	31	22	12
Water Skiing	3	1	3	4
Day Sailing	2	3	3	1
Overnight Cruising	1	1	1	0
Racing	1	1	0	0
Diving	0	0	0	0
Activity Combinations	14	12	18	16

Use of Delaware Boating Resources

Delaware-registered boaters used a variety of natural resources for their boating activity. (See Figure 1.) Delaware's inland bays and Delaware Bay were the most popular boating areas among study respondents, with more than half of the respondents reporting some use of these areas (Table 17). The inland bays accounted for more boating activity than any other area (32% of the total) and were used exclusively by 17% of the boaters. Much smaller numbers of boaters used the Atlantic Ocean, the Delaware River, and the freshwater resources in Delaware for boating.

Table 17. Distribution of boating activity by water resource used.

Water Resource	Percent of Total Boating Activity					
	0	1-32	33-66	67-99	100	Mean
Delaware River	82%	11%	5%	2%	<1%	6%
Delaware Bay	46	22	11	12	9	27
Atlantic Ocean	70	17	8	4	1	10
Inland Bays (Rehoboth, Indian River, Assawoman)	45	19	11	9	17	32
Freshwater Ponds/Streams	85	5	3	3	4	9
Other	76	6	5	7	5	15

Choice of water resources was related to primary home residence, size of boat, and type of facility used. Boaters from Kent County used Delaware Bay to a greater extent (44%) than boaters from other areas (Table 18). The inland bays were used most heavily by boaters from Sussex County (46%), and Maryland (30%), and least heavily by boaters residing in Kent County (12%).

Table 18. Distribution of boating activity by home residence.

Boating Area*	Home Residence						
	All Boaters n=743	Delaware			Out-of-State		
		New Castle n=191	Kent n=62	Sussex n=161	PA n=250	MD n=48	Other n=31
Delaware River	6%	7%	3%	1%	8%	5%	15%
Delaware Bay	27	18	44	30	29	20	25
Atlantic Ocean	10	9	2	8	15	8	23
Inland Bays	32	30	12	46	28	47	22
Freshwater	9	12	25	5	6	5	2
Other	15	23	14	10	12	13	13

*Differences for all boating areas significant at .01 level.

Not surprisingly, larger boats were more likely to use the Atlantic Ocean than smaller boats, but even boats 26 feet or longer used the ocean for only about one-fourth (23%) of their total boating activity (Table 19). These larger boats reported that most of their boating activity took place on other water bodies (41%), such as the Chesapeake Bay or New Jersey water bodies. Medium-sized boats (16-25 feet) used Delaware Bay and the inland bays to the same extent--about one-third. Smaller boats (less than 16 feet) used the inland bays (36%) twice as much as Delaware Bay (18%), and used freshwater areas (24%) to a much greater extent than boats that are longer than 16 feet in size (3%).

Table 19. Distribution of boating activity by size of boat.

Boating Area*	Boat Size (feet)			
	All Boaters n=743	<16 n=211	16-25 n=484	>25 n=48
Delaware River	6%	5%	6%	7%
Delaware Bay	27	18	32	17
Atlantic Ocean	10	2	13	23
Inland Bays	32	36	33	10
Freshwater	9	24	3	0
Other	15	16	12	41

*Differences for all boating areas except Delaware River (n.s.) significant at .01 level.

With respect to type of facility used, trailered boats (35%) appeared more likely than in-water boats (marina, 16% and private docks, 13%) to use Delaware Bay, while boats kept in the water make greater use of the inland bays (Table 20). Boats kept at private docks, in particular, used the inland bays heavily (56%). These patterns reflect the availability of the various types of facilities on each of these resource areas. Trailered boats were much more likely than in-water boats (marina, 1% and private docks, 2%) to use freshwater, but freshwater still accounted for only a small proportion (14%) of the total use of even trailered boats.

Table 20. Distribution of boating activity by type of facility.

Boating Area*	Type of Facility			
	All Boaters n=743	Marina n=177	Private Dock n=115	Launch Ramp n=450
Delaware River	6%	6%	2%	7%
Delaware Bay	27	16	13	35
Atlantic Ocean	10	16	19	6
Inland Bays	32	41	56	23
Freshwater	9	1	2	14
Other	15	20	7	14

*Differences for all boating areas significant at .01 level.

Boating Travel Patterns

Tables 21 through 24 demonstrate on a regional basis how boating participation patterns shift between areas within and outside of Delaware. More specifically, these tables document the extent to which boat owners who reside in a particular area travel to another area for their boating experience. The tables also indicate the extent to which boaters using a particular area originate from outside of that area.

A large majority (70%) of Delaware-registered boats kept in the water during the boating season used boat slips located within Sussex County (Table 21). Nearly all (97%) Sussex County residents who kept their boats in the water during the boating season used a slip located within Sussex County. In contrast, only 45% of Kent County residents with in-water boats berthed their boats within Kent county; an equal percentage used a Sussex County location (45%), and the remaining 10% kept their boat in Maryland. Very few (5%) boaters living in New Castle County kept their boats in the water within their own county; nearly two-thirds (64%) transported their boats to Sussex County and one-fourth used Maryland facilities. Out-of-staters, too, were most likely to use boat slips located in Sussex County.

Table 21. Boat slip location by home residence.

Boat Slip Location	Home Residence						
	All Boaters n=275	Delaware			Out-of-State		
		New Castle n=73	Kent n=11	Sussex n=66	PA n=90	MD n=18	Other n=17
New Castle	2%	5%	0%	0%	1%	0%	6%
Kent	4	4	45	0	2	0	0
Sussex	70	64	45	97	61	77	47
Pennsylvania	2	0	0	0	7	0	0
Maryland	17	25	10	3	21	22	12
Other	4	1	0	0	7	0	24

Among the relatively few boats that were berthed in New Castle County, two-thirds were owned by county residents and the remaining one-third came from out-of-state (Table 22). Half of the boats kept in Kent County boat slips belonged to county residents, while 30% came from New Castle County and the remaining 20% from Pennsylvania. The origin of those who berthed boats in Sussex County is more evenly distributed; one-third were county residents, another 24% were from New Castle County, and most of the remainder were from out-of-state. Only 3% of the boats berthed in Sussex County slips were owned by residents of Kent County.

Table 22. Home residence by boat slip location.

Home Residence	Boat Slip Location						
	All Boaters n=275	Delaware			Out-of-State		
		New Castle n=6	Kent n=10	Sussex n=193	PA n=6	MD n=46	Other n=11
New Castle	26%	67%	30%	24%	0%	39%	9%
Kent	4	0	50	3	0	2	0
Sussex	24	0	0	33	0	4	0
Pennsylvania	33	17	20	28	100	41	55
Maryland	6	0	0	7	0	9	0
Other	6	17	0	4	0	4	36

Somewhat different patterns are seen for the use of launch ramps by trailered boats. Over one-third (35%) of all reported trips to launch ramps were made to ramps in Kent County, and nearly another one-third (30%) used ramps in Sussex County (Table 23). Seventeen percent of trips to launch ramps involved ramps in surrounding states, and 12% utilized freshwater areas in Delaware.

Table 23. Destination of boat ramp use by home residence.

Boat Ramp Destination	Home Residence						
	All Boaters n=7813*	Delaware			Out-of-State		
		New Castle n=2443	Kent n=888	Sussex n=1589	PA n=2364	MD n=418	Other n=111
New Castle County	6%	15%	0%	1%	4%	0%	4%
Kent County	35	23	58	30	43	42	0
Sussex County	30	21	10	55	33	30	5
Delaware Freshwater	12	24	24	6	1	1	0
Maryland	12	12	8	5	13	24	31
Other States	5	5	0	3	6	3	60

*Numbers of cases reported in this table are based on the total number of trips to boat ramps.

Residents of New Castle County were most likely to use boat ramps in Kent (23%) or Sussex Counties (21%), or freshwater areas (24%) in Delaware (Table 23). Only 15% of their trips remained within New Castle County. Boaters living in Kent and Sussex County were more likely to use ramps within their home counties (58% and 55%, respectively), with virtually no use of resources in New Castle County and relatively little traveling to ramps out-of-state. Most boaters from Pennsylvania (43% and 33%) or Maryland (42% and 30%) used ramps in either Kent County or Sussex County, respectively.

Of the relatively small use of boat ramps in New Castle County, a large majority (79%) came from local county residents with most of the remaining coming from Pennsylvania (18%) (Table 24). Use of Kent County ramps came more evenly from various areas, with the largest share (37%) coming from Pennsylvania. More than one-third of the use of Sussex County ramps came from Sussex County residents, with another one-third coming from Pennsylvania and 22% from New Castle County. The majority (62%) of trips to freshwater ramps in Delaware were made by New Castle County residents. Trips to launch ramps outside of Delaware were most commonly made by New Castle County residents and those Delaware-registered boaters with permanent residences outside of Delaware.

Table 24. Destination of boat ramp use by home residence.

Home Residence	Location of Boat Ramp						
	All Boaters n=7813*	New Castle n=474	Kent n=2746	Sussex n=2373	DE Fresh- water n=930	MD n=896	Other States n=393
New Castle County	31%	79%	20%	22%	62%	34%	29%
Kent County	12	0	20	4	23	8	0
Sussex County	20	2	17	37	11	10	12
Pennsylvania	30	18	37	32	4	33	38
Maryland	6	0	6	5	0	11	3
Other	1	1	0	0	0	4	17

*Numbers of cases reported in this table are based on the total number of trips to boat ramps.

Boating Safety

Safe boating is promoted by the U.S. Coast Guard, national boating organizations, and state level agencies and groups to help insure that the activity is conducted in a responsible fashion. United States Coast Guard regulations related to recreational boating are developed and/or revised each year. The majority of these regulations focus on safe boating practices. Numerous organizations offer inspections of recreational boats to make sure minimum standards are met for the boats and any safety-related equipment onboard. In addition, boat safety training courses are offered by these same groups and organizations. These courses stress learning the "rules of the road," understanding marking devices and buoy positions, and understanding basic use of safety equipment.

This section explores boaters' responses to a series of safety-related questions. Tables and discussion are provided to show significant differences between responses to these questions and boaters' place of residence, boat size, and type of facility used.

Safe Boating Practices

Since boating safety is such a prominent element of the boating experience, a series of safety-related questions were asked of the sample of boaters. The questions attempted to ascertain the extent to which boaters make themselves safety conscious before and during their boating activity. Table 25 is quite comprehensive and provides comparisons based on boaters' home residence, size of boat, and type of facility used. These classification variables are examined with respect to boaters' familiarization with new Coast Guard regulations, whether they receive annual safety inspections of their vessels from either state Coast Guard Auxiliary flotillas or the state of Delaware, and if they have taken a safe boating course.

Pennsylvania and Maryland residents had the highest percentage of familiarization with new Coast Guard regulations: 86% and 85%, respectively. Kent County, Delaware residents had the lowest familiarization rate (76%), even though more than three-quarters of the residents noted that they do become familiar with the new regulations each year.

When familiarization with new Coast Guard regulations is examined by size of boat, significant differences appear. The larger the boat owned, the more inclined the owner was to become familiar with new regulations. Only 69% of the owners of boats less than 16 feet annually familiarized themselves with new regulations. Eighty-five percent of the boat owners in the 16 to 25 foot class responded that they became familiar, and 92% of the owners of boats 26 feet and greater made themselves aware of new regulations.

Trailerred boats (79%) and marina-based boats (82%) exhibited no major differences in becoming familiar with Coast Guard regulations. However, those boaters who kept their boats at private docks exhibited a higher familiarization rate (90%) than the other two groups.

When home residence is examined with respect to receiving a Coast Guard Auxiliary inspection, some distinct differences are evident. Pennsylvania residents (44%) and residents of other states (44%) were more likely to respond that they received Coast Guard Auxiliary

Table 25. Percent of Delaware-registered boaters who familiarize themselves with Coast Guard regulations, receive Coast Guard Auxiliary or State of Delaware inspections, and who have taken a boating safety training course by home residence, boat size, and type of facility.

	All Boaters n=713	Home Residence					Boat Size (feet)		Type of Facility				
		Delaware		Out-of-State			<16 n=203	>25 n=49	Marina n=172	Private Dock n=111	Launch Ramp n=429		
		New Castle n=185	Kent n=59	Sussex n=151	PA n=243	MD n=44	Other n=32						
Familiarize self with Coast Guard regulations each year.*	81	78	76	79	86	85	78	69	85	92	82	90	79
Receive Coast Guard Auxiliary Courtesy Safety Inspection.**	37	36	33	30	44	30	44	23	42	52	44	34	35
Receive State of Delaware Courtesy Safety Inspection.	14	17	15	17	12	8	9	11	16	11	13	14	15
Have taken boating safety training course.***	52	49	43	41	58	70	66	45	54	63	58	63	46

* Boat size differences significant at .01 level; type of facility differences significant at .05 level.

** Boat size differences significant at .01 level.

*** Home residence differences significant at .01 level; boat size differences significant at .05 level; type of facility differences significant at .01 level.

inspections than residents of any of the Delaware counties or Maryland.

When boat size is examined with regard to receiving Coast Guard Auxiliary safety inspections, the larger the boat class, the more inclined boaters were to obtain an inspection (Table 25).

Similarly, marina-based boaters (44%) more often received Coast Guard Auxiliary inspections than boats kept at private docks (34%) and boaters using launch ramps (35%). This may be due to the fact that auxiliary personnel will station themselves at a marina facility and these boaters take advantage of the opportunity to have their vessels inspected. Auxiliary personnel also station themselves at boat ramps throughout the state during the boating season, however when launching and retrieving a boat, time is limited to allow for a thorough safety inspection.

Relatively few boaters received state of Delaware safety inspections, and this was especially true for non-Delawareans. New Castle and Sussex County residents were the most likely to report receiving state inspections (17%). Boaters owning boats in the 16-25 foot class (16%) received more Delaware inspections than did boat owners in the other two size classes. No obvious differences appear when type of facility is examined with regard to receiving a Delaware inspection (Table 25).

Boaters were also asked whether they had taken a safe boating course. These courses are offered by numerous organizations at a variety of locations and times throughout the year. Table 25 provides a breakdown of boaters who responded that they had taken at least one safe boating course. There was no specified time requested as to when they had taken a course; therefore, it is possible that respondents could have taken a course a number of years ago or during 1985, when the survey was conducted.

About one-half of the boaters sampled reported that they had taken a safe boating course. When home residence is examined with regard to taking a safe boating course, more Maryland residents reported taking a course than any other resident group (70%). The

lowest responding group of boaters was from Sussex County. Only 41% of these residents noted that they had taken a safe boating course.

When comparisons were observed based on size of boat, the larger the boat owned, the more respondents indicated that they had taken a safe boating course. Forty-five percent of boaters owning boats less than 16 feet in length had taken a course; more than one-half of the boaters in the 16-25 foot class took a course and almost two-thirds of the owners of boats 26 feet and greater responded that they had taken a safe boating course.

Marina-based boaters (58%) and boaters who kept their boats at private docks (63%) were more inclined to have taken safe boating courses than boaters who used launch ramps (46%).

Boaters were also asked to indicate from which organization they took safe boating courses. The Coast Guard Auxiliary and the U.S. Power Squadron led the way in providing courses for Delaware-registered boaters. One-third of the respondents noted that they received training from Coast Guard Auxiliary flotillas, 18% received their training from U.S. Power Squadron units, and both the American Red Cross and the State of Delaware provided training to 4% of the respondents. Seven percent of the respondents mentioned receiving training from "other" groups or organizations such as the U.S. Navy, U.S. Coast Guard, or other state programs.

Boat Titling and Licensing

Additional safety-related questions asked boaters whether or not they favored titling laws for motorboats and whether or not boat operators should be required to obtain an operator's license. These two questions have implications for safety and security. For instance, titling a motorboat could make boats less susceptible to vandalism and theft. Licensing boat operators would insure that all boaters have a certain proficiency level before being allowed to operate a motor boat.

Only about one-fifth of the boaters favored titling of motorboats (Table 26). Maryland residents favored titling legislation (26%) more often than residents of Delaware or other states

Table 26. Percent of Delaware-registered boaters who favor titling laws and operator licenses by home residence, boat size, and type of facility.

	All Boaters n=727	Home Residence						Boat Size (feet)			Type of Facility						
		Delaware		Sussex		PA		MD		Other		<16 n=205	16-25 n=476	>25 n=47	Marina n=173	Private Dock n=112	Launch Ramp n=443
		New Castle n=188	Kent n=62	Sussex n=154	PA n=247	MD n=47	Other n=31										
Favor Titling of Motorboats	22	21	16	23	23	26	13	21	22	16	27	24	19				
Favor Licensing of Operators*	42	38	37	42	47	39	38	33	45	56	55	52	35				

*Boat size differences and type of facility differences significant at .01 level.

(Table 26). Small differences are observed when boat length is examined with regard to titling. Marina-based boaters (27%) and boaters who used private docks (24%) favored titling laws more often than boaters who trailered their boats (19%).

Forty-two percent of the total sample favored operator's licenses for boaters. When observed by place of residence, Pennsylvania residents (47%) and boaters residing in other states (48%) favored operator's licenses more often than residents from Delaware counties and Maryland. Sussex County residents (42%) had the highest rate of favoring licenses among Delaware residents.

There is also a significant difference evident as boat size increases. Owners of boats under 16 feet (33%) favored an operator's license less than owners of larger boats. Forty-five percent of individuals owning boats in the 16-25 foot class favored operator's licenses. Respondents with boats 26 feet and greater had the highest rate of favoring an operator's license--56%.

Boaters who kept their boats in the water--at marinas (56%) and at private docks (52%)--favored operator's licenses more often than boaters who used launch ramps (35%).

Role of the Delaware Boating Council

Boaters were asked whether they were aware of the role played by the Delaware Boating Council (DBC). The council, formed in 1977, is a nonprofit public service group composed of individuals and representatives of organizations concerned with the best interest of all boaters using our waterways, with special emphasis on boating safety. The council promotes safe boating through its own educational efforts and those of its member organizations (Delaware Boating Council, n.d.).

Only 23% of the total respondents noted that they were aware of the Council and its role. As would be expected, more Delaware residents were aware of the council than out-of-state residents. Also, 35% of the owners of boats in the 26 foot and greater size class were aware of the council and its role. Boaters owning boats less than 16 feet in length and in the 16-25 foot category

had significantly less knowledge of the organization--20% and 23% respectively.

Boating and Weather

Obtaining weather information is also important to recreational boaters for safety reasons. This section reports on boaters' access to weather information, as well as the sources of weather reports they utilize. Significant differences between boaters' responses and home residence, boat size and type of facility are depicted in tables.

As Table 27 indicates, nearly all boaters (98%) obtained some form of weather observation before venturing out on the water. This response is consistently high across all types of boaters; with the lowest response of 95% indicated for boaters with boats under 16 feet in length.

Access to Weather Information

When boaters were asked if they obtained weather reports while out on the water, differences among boating types begin to appear. The overall response was that two-thirds of the boaters obtained weather information while boating. When home residence is examined, "other" boaters had the highest response rate (77%). Pennsylvania boaters followed with a 72% response rate. New Castle County boaters were the least likely to obtain weather information while boating (58%).

Boat size is an important indicator of whether on-water weather reports will be sought. Ninety-one percent of boaters with boats larger than 26 feet obtained weather information while boating. Seventy-five percent of boaters in the 16-25 foot range received reports while on the water. Fewer than 40% of the boaters with boats less than 16 feet sought weather information while boating. This difference can be explained, partially, since the larger the boat, the greater the chance that weather receiving equipment is available on these boats.

Table 27. Percent of Delaware-registered boaters obtaining weather reports before boating, weather reports while boating, and perceiving access to weather information satisfactory by home residence, boat size, and type of facility.

	All Boaters n=709	Home Residence				Boat Size (feet)		Type of Facility					
		Delaware		Out-of-State		<16 n=197	16-25 n=465	>25 n=48	Marina n=173	Private Dock n=110	Launch Ramp n=423		
Get weather reports before boating.*	98	96	98	97	98	98	97	95	99	98	98	98	98
Get weather reports while boating.**	66	58	65	64	72	64	77	39	75	91	83	65	59
Access to weather information satisfactory.	92	94	92	91	92	92	97	93	91	98	96	91	91

* Boat size differences significant at .05 level.

** Boat size differences and type of facility differences significant at .01 level.

Though significant differences are evident, with regard to on-water weather reports for boats using different facilities, they are not as large as between size categories. However, marina-based boaters (83%) obtained weather reports while boating more often than boaters who used private docks (65%) or boaters who used launch ramps (59%). This would seem likely, since marina-based boats are also typically larger boats with advanced electronic gear on board.

Overall, boaters are satisfied with their access to weather information (92%). Though a few differences are obvious when boat types are examined, there are not significant differences (Table 27). One notable observation is that owners of both larger boats (26 feet and greater) and marina-based boats were the most satisfied with the weather reports that they received. These boaters are also the ones who obtained weather information while boating, thus they are more inclined to keep informed of weather occurrences throughout their entire boating experience.

Sources of Weather Reports

To better understand the sources of boating weather reports, boaters were asked how often certain types of weather sources were utilized. Nine different sources of weather information were listed on the survey questionnaire and boaters were requested to answer how often they used each source. The responses were: "regularly," "sometimes," or "never."

Table 28. Sources of weather reports by Delaware-registered boaters (n=544).

Source of Weather Reports	Frequency of Use (%)		
	Regularly	Sometimes	Never
NOAA-VHF Continuous Reporting	52.4	14.4	33.2
Marine Operator	11.6	20.0	68.4
AM Commercial Radio	58.2	26.3	15.6
FM Commercial Radio	58.0	26.6	15.4
Univ. of Delaware Mariners' Reporting Program (MAREP)	19.2	17.6	63.1
Newspapers	50.6	28.4	21.0
Telephone Weather Information	26.5	29.6	43.9
Ask Other People	24.1	49.0	26.9
U.S. Coast Guard	14.1	28.5	57.4

Table 28 reports on the sources of weather reports used by Delaware-registered boaters. When the "regularly" and the "sometimes" columns are added, F.M. and A.M. commercial radio broadcasts are relied upon most often for weather information (85% and 84%, respectively). The least used source of information among the sources listed was the marine operator; only 32% of the respondents relied on this source of information "regularly" or "sometimes."

When source of weather reports is examined by home residence, boat size and type of facility, some user differences are evident. Table 29 provides responses by boaters regarding their use of weather reports by these three classification variables. Differences do occur across each type of reporting system identified. However, for most of the sources it is difficult to explain the differences.

One means of examining and reporting on the differences between home residence and use of various weather reporting sources is to note the most often used and least often used source by each place of residence. For New Castle county residents, their most reported source of weather information was newspaper reports (86%) and the least used source was the University of Delaware's MAREP program (29%). For Kent County, the most used source was also

Table 29. Sources of weather information used by Delaware-registered boaters by home residence, size of boat, and type of facility (includes those boaters who use weather information sources "regularly" and "sometimes").

	All Boaters n=544	Home Residence						Boat Size (feet)		Type of Facility			
		Delaware		Out-of-State				<16 n=148	16-25 n=361	Marina n=133	Private Dock n=77	Launch Ramp n=333	
		New Castle n=147	Kent Sussex n=108	PA n=192	MD n=32	Other n=24							
NOAA-VHF/Continuous Reporting*	67	53	65	76	71	73	69	52	70	90	81	78	57
Marine Operator**	32	28	30	33	35	29	34	25	33	45	44	32	26
AM Radio	84	81	84	83	87	89	89	87	85	75	82	84	85
FM Radio	85	84	87	92	81	86	77	85	86	72	87	83	85
Univ. of Delaware MAREP**	37	29	49	54	32	27	25	28	41	36	41	38	35
Newspapers***	79	86	89	78	74	81	59	84	78	72	76	78	81
Telephone Weather****	56	60	62	62	47	69	46	56	58	47	46	50	61
Ask Other People	73	73	72	72	79	72	67	73	74	71	78	77	70
U.S. Coast Guard	43	39	24	45	48	48	37	34	46	47	53	43	39

* Home residence, boat size, and type of facility differences all significant at .01 level.
 ** Boat size and type of facility differences significant at .05 level.
 *** Home residence differences significant at .01 level.
 **** Home residence differences significant at .01 level.
 ***** Type of facility differences significant at .05 level.

newspapers (89%) and the least used source, the U.S. Coast Guard (24%). Sussex County residents noted that F.M. commercial radio (92%) was their greatest source of weather information and the marine operator (33%) was the least used source of reports.

All out-of-state residents exhibited similar patterns for their use of weather reports. The most popular source was A.M. commercial radio (87-89%) and the least popular source was the University of Delaware's MAREP program (25-32%).

Most often used weather sources and least often used sources also differ when boat size is examined. Boats less than 16 feet most often used A.M. commercial radio (87%) as their primary source of weather information, and used the marine operator (25%) the least. Boats in the 16-25 foot class used F.M. commercial radio (86%) most often and also used the marine operator the least (33%). Boats 26 feet and greater most often used NOAA-VHF continuous reporting broadcasts (90%) and reported using the University of Delaware's MAREP program the least (36%) (Table 29).

Sources of weather information also varied somewhat by type of facility. Marina-based boaters most often used F.M. commercial radio (87%) and used the University of Delaware's MAREP program (41%) the least. Boaters using private docks utilized A.M. commercial radio (84%) the most often and used the marine operator (32%) the least. Boaters who trailered their boats used A.M. and F.M. commercial radio the most often (85% each) and used the marine operator (26%) the least.

Spending Patterns

Boating-related expenditures in the United States have grown dramatically from \$7.5 billion in 1979 to over \$12 billion in 1984 (Graefe, 1986). It is clear from statistics such as these that boating plays an important economic and social role. This section examines boating activity by Delaware-registered boaters with an emphasis on an analysis of spending patterns. The economic data presented are broken into the two categories of annual fixed costs and daily

expenditures. An estimate of the total spending by all Delaware-registered boaters (39,638) is also provided. In addition, the distribution of reported spending across regions is discussed. Finally, both fixed costs and daily expenditures are examined to see how they vary with the type of boating facility used (marina, private dock, or launch ramp) and also by boat size.

Annual Fixed Costs by Delaware-Registered Boaters

Annual fixed costs are those costs incurred by boaters in order to participate in boating activity for the year. These include spending on such items as insurance, docking, and any new items purchased for the boat during a particular year. Costs associated with the purchase of a boat are not included in this analysis.

Table 30 shows the average amount spent by Delaware-registered boaters on annual fixed costs by different categories of spending. Each spending category is broken into columns representing the level or amount of spending. The percentage figures represent those boaters who spent money in a given range for a specific item. At the right side of the table appears a column with the average amount spent for each category. In some instances a large percentage of surveyed boaters reported no spending in a given category, such as winter storage (79.2%), other supplies (62.8%) and docking (59.7%). In these instances the average spending estimate (in the far right column) is weighted downward.

The average annual fixed cost incurred by each Delaware registered boater in 1985 was \$902.10. The largest of the spending categories shown in Table 30 was new items for the boat, which represented 24% of the average annual fixed cost per boater. This category is followed by repair and maintenance (17%), docking fees (15%), insurance (13%), and fitting out the boat (11%). The remaining 20% of the annual fixed costs consisted of other supplies (7%), winter storage (5%), other items (5%) and winterizing (4%).

Table 30. Annual fixed costs by Delaware-registered boaters (n=642).

	\$0	\$1-50	\$51-100	\$101-250	\$251-500	>\$500	Avg. \$
Fit Out Boat	38.9%	25.8%	16.3%	12.0%	5.4%	1.6%	\$ 95.50
New Items	35.8	18.9	14.0	13.2	10.6	7.5	214.40
Docking	59.7	6.2	4.2	12.0	11.5	6.4	137.90
Repair/Maint.	46.9	12.9	12.2	12.0	9.0	7.0	155.50
Other Supplies	62.8	16.7	9.8	5.6	3.5	1.6	60.50
Winter Storage	79.2	4.2	3.5	6.4	5.6	1.1	47.40
Winterizing	46.8	37.3	8.4	6.1	1.2	0.2	32.40
Insurance	37.8	9.2	13.7	27.0	10.6	1.7	114.50
Other	92.8	1.9	0.5	1.7	1.1	2.0	44.00
Total							\$902.10

Daily Expenditures by Delaware-Registered Boaters

Daily expenditures are those costs incurred by boaters each time they take their boats out on the water. These expenditures may include gas for the boat, launch fees, bait and tackle for fishing and other associated expenses. The total annual daily expenditures are calculated by multiplying the average daily expenditure by the average number of trips taken each year. Survey results indicated that Delaware-registered boaters took an average of 34 boating trips in the 1985 boating season.

Table 31 shows the average amount spent on daily expenditures by different categories of spending. As in the case of fixed cost spending, a large percentage of boaters reported no spending for certain daily spending categories. These categories included other items (97.5%), lodging (90.4%), and launch fees (79.7%). The low dollar averages (Table 31) for these categories is also weighted downward by this lack of spending. The average annual daily expenditure by each Delaware-registered boater in 1985 was \$2,019.60. This figure was based on an average of \$59.40 per trip multiplied by 34 trips per year.

Table 31. Daily expenditures by Delaware-registered boaters (n=686).

	\$0	\$1-10	\$11-20	\$21-40	\$41-100	>\$100	Avg. \$
Boat Gas	4.1%	41.8%	31.8%	16.8%	4.5%	1.0%	\$17.58
Car Gas	23.2	40.5	25.2	10.1	1.0	0.0	10.82
Snacks	19.0	47.5	23.4	7.9	2.1	0.1	11.29
Restaurants	67.8	11.2	10.5	6.1	4.1	0.6	7.89
Lodging	90.4	2.7	2.1	2.5	1.9	0.4	3.50
Bait/Tackle	24.6	64.6	7.6	1.6	1.3	0.3	6.57
Launch Fees	79.7	18.4	0.4	0.6	0.6	0.0	1.42
Other	97.5	1.8	0.4	0.2	0.1	0.0	0.33
Total							\$59.40

The largest of the categories for average daily expenditures shown in Table 31 was for boat gas, which represented 30% of the total daily expenditure by Delaware-registered boaters in 1985. This was followed by snacks (19%), car gas (18%), restaurant meals (13%), bait and tackle (11%), lodging (6%), launch fees (2%), and other items (1%). Nearly one-half of daily expenditures was allocated to fuel (boat gas and car gas). With 97% of Delaware-registered boaters using gasoline-powered engines, this large dependence is to be expected.

The average total amount spent by each Delaware-registered boater (including fixed costs and daily spending) in 1985 was \$2,921.70 (not including the amortized capital cost of an individual's boat).

Total Spending by Delaware-Registered Boaters

To estimate the total amount of spending by Delaware-registered boaters in 1985, it is necessary to multiply the total average expenses presented in Tables 30 and 31 by the 39,638 boaters registered in Delaware in 1985. In addition, when totaling the daily expenses, it is also necessary to multiply the average number of trips taken per boater during the 1985 boating season (34).

The total estimated spending by Delaware-registered boaters in 1985 was \$116 million. This amount is composed of \$36 million (31% of total) for fixed costs and \$80 million (69% of total) for daily expenses (Figure 2). A significant percentage of the total spending occurs outside of the state of Delaware. This aspect will be explored in the next section.

Location of Spending

Of the total \$116 million spent by Delaware-registered boaters in 1985, approximately 28% or \$32 million was spent at out-of-state locations. The remainder (\$84 million) was spent in the three Delaware counties--New Castle (\$16 million), Kent (\$29 million), and Sussex (\$39 million). Tables 32 and 33 break out spending by the amount and location of spending on annual fixed costs and daily expenses by Delaware-registered boaters, respectively.

Table 32 shows the location of spending for fixed costs by Delaware-registered boaters for different spending categories. The total estimated amount of spending on fixed costs was approximately \$36 million. Thirty-five percent of total annual fixed costs or \$12.6 million was spent at out-of-state locations. Sussex County was the location for 40%, or \$14.3 million of fixed cost spending, followed by New Castle County at 18% (\$6.4 million), and Kent County at 7% (\$2.4 million). Spending for winter storage (50%) and insurance (51%) were the two largest expense categories purchased out-of-state (by percentage of total spending) by Delaware-registered boaters. Winterizing boats and purchasing new items (36% each) were the next largest categories of items purchased out-of-state.

Table 33 shows the amount and location of spending on daily expenses by the home residence of boaters. The total estimate of daily expense spending was \$80 million. The level of spending occurring in specific locations (New Castle, Kent, Sussex, out-of-state) is provided in the columns of Table 33. The amount of daily spending is greatest in Kent County for a total of

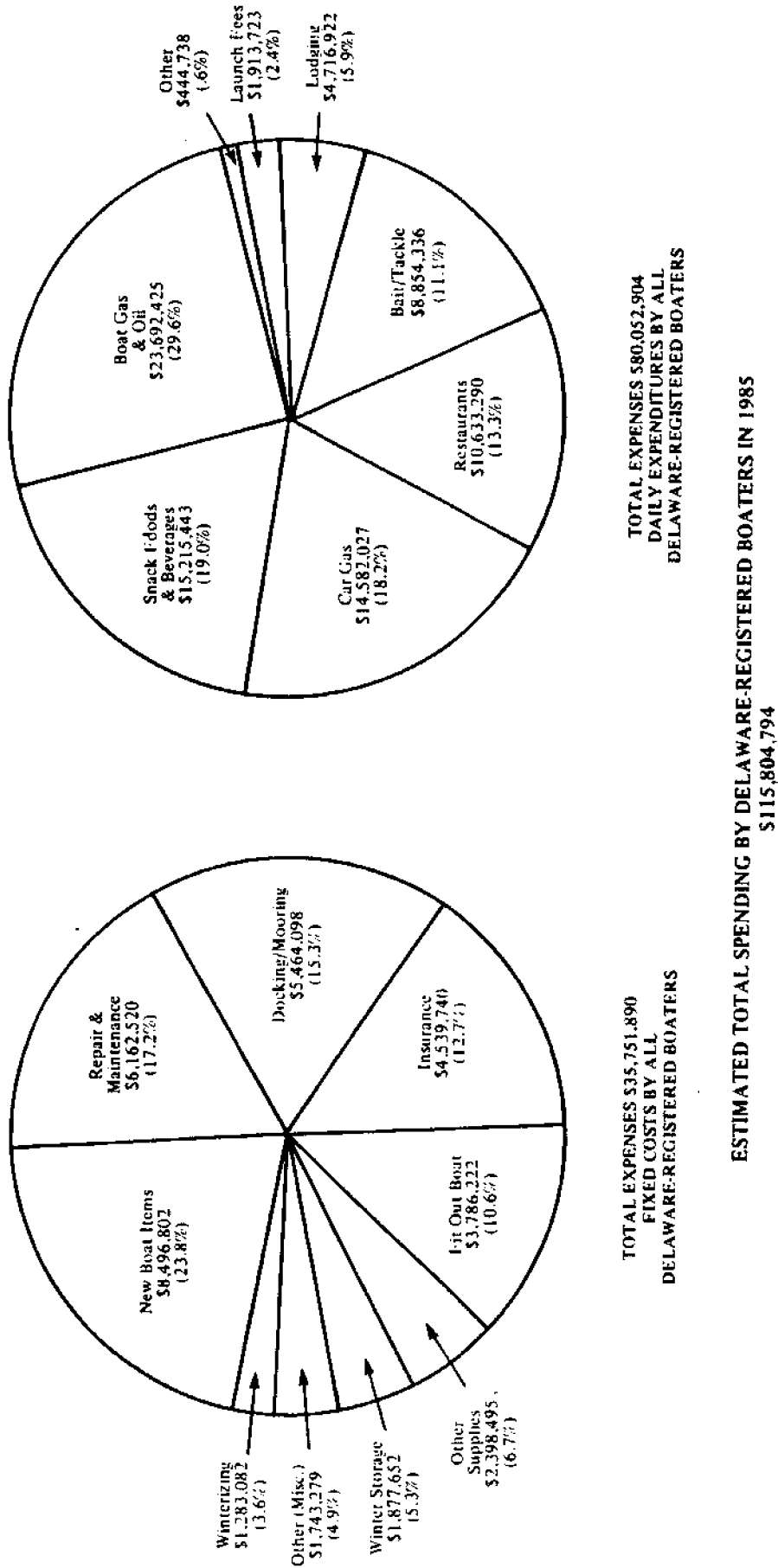


Figure 2. Estimated total annual fixed costs and daily expenditures by all Delaware-registered boaters.

Table 32. Total estimated annual fixed costs (\$) of Delaware-registered boaters by location of spending.

Spending Category	Location of Spending			Row Total	
	New Castle	Kent	Sussex		Out-of-State
Fit Out Boat	829,183	295,325	1,582,641	1,079,073	3,786,222
New Items	1,775,832	560,789	3,067,346	3,092,836	8,496,803
Docking/Mooring	382,487	344,238	2,983,398	1,753,975	5,464,098
Repairs/Maintenance	961,353	412,889	2,828,597	1,959,681	6,162,520
Other Supplies	685,970	187,083	961,796	563,646	2,398,495
Winter Storage	165,233	82,617	685,343	944,459	1,877,652
Winterizing	239,936	76,985	508,100	458,060	1,283,081
Insurance	998,743	272,384	953,345	2,315,269	4,539,741
Other	367,832	183,044	733,920	458,482	1,743,278
Column Total	6,406,569	2,415,354	14,304,486	12,625,481	35,751,890
Percentage of Total Fixed Costs	18%	7%	40%	35%	

Table 33. Total estimated daily expenses (\$) by home residence and location of spending.

Home Residence	Location of Spending				Row Total
	New Castle	Kent	Sussex	Out-of State	
New Castle	7,273,607	6,533,918	6,164,074	4,684,696	24,656,295
Kent	714,472	5,547,667	1,420,539	722,877	8,405,555
Sussex	418,356	4,360,562	9,380,839	1,930,876	16,090,633
Out-of-State	865,212	10,135,338	7,756,006	12,143,865	30,900,421
Column Total	9,271,647	26,577,485	24,721,458	19,482,314	80,052,904
Percentage of Total Daily Expenses	12%	33%	31%	24%	

\$26.6 million or 33% of the total daily expense spending. Following closely is Sussex County with \$24.7 million or 31% of total daily expense spending. Out-of-state locations account for 24% or \$19.5 million in daily spending, and New Castle County had an estimated \$9.3 million (12%) of daily spending by Delaware-registered boaters in 1985.

Daily expense spending can also be examined by the home residence of boaters by reviewing the rows in Table 33. Each row represents daily expense spending broken out by boaters' home residence. Out-of-state residents account for the largest level of daily expense spending, providing \$31 million in expenditures. Nineteen million dollars (61%) of this spending occurs in Delaware. New Castle County residents account for the next largest amount of spending with \$24 million, with approximately 80% occurring in Delaware. Sussex County residents provided an additional \$16 million in spending (88% spent in Delaware), and Kent County residents provided \$8 million (91% spent in Delaware).

Table 34. Average annual fixed costs and daily expenses by facility used.

	Average Annual Fixed Costs per Boater by Facility		
	Marina n=165	Private Dock n=99	Launch Ramp n=378
Fit Out Boat	\$ 138.33	\$ 95.72	\$ 77.02
New Items	357.88	270.49	137.95
Docking	405.67	116.11	27.00
Repair/Maintenance	284.29	131.96	106.01
Supplies	112.50	48.03	41.25
Winter Storage	116.36	51.87	16.10
Winterizing	55.49	32.19	22.42
Insurance	175.07	128.12	83.80
Other	32.79	32.83	51.92
Total	\$1,678.38	\$907.32	\$563.47

	Average Daily Expenses per Boater by Facility		
	Marina n=170	Private Dock n=105	Launch Ramp n=410
Boat Gas	\$23.79	\$17.78	\$15.00
Car Gas	8.43	7.12	12.78
Snacks	14.26	10.77	10.20
Restaurants	12.26	8.13	6.03
Lodging	2.48	2.77	4.12
Bait/Tackle	5.07	7.67	6.93
Launch Fees	0.15	0.27	2.25
Other	0.66	0.14	0.24
Total	\$67.10	\$54.65	\$57.55

Fixed Costs and Daily Expenses by Facility Used

Table 34 provides a breakdown of fixed costs and daily expenses by the type of boating facility used (marina, private dock, or launch ramp) by Delaware-registered boaters. The data tend to follow an expected pattern. For example, the fixed costs for docking were, on the average, \$406 for marina-based boats, followed

by \$116 for boats kept at private docks, and \$27 for trailered boats. This pattern is to be expected due to the higher costs of docking at a marina. Most fixed cost categories tended to be higher for boaters using marinas. When annual fixed costs are totaled for the three facility types, marina-based boaters spent an average of \$1,678; boaters using private docks spent \$907; and boaters trailering their boats spent \$563.

The data on daily expenses show that marina-based boaters spent more on fuel, while less on bait/tackle, than the other boating facility users (private docks and launch ramps). This pattern of spending is consistent with earlier findings showing less interest in fishing and more interest in cruising by marina-based boaters relative to other boaters. In addition, marina-based boaters also tended to spend 40 to 60% more on food (snacks and restaurants) than private dock boaters and boaters using launch ramps, respectively. When daily expenses are totaled for the three facility types, marina-based boaters spent an average of \$67 per boating trip; boaters using private docks spent approximately \$55 per trip; and boaters using launch ramps spent almost \$58 per trip.

Fixed Costs and Daily Expenses by Boat Size

Table 35 breaks out the average fixed costs and daily expenses by boat size. Boating costs tended to increase as boat size increases for the different categories of spending for both fixed costs and daily expenses, as would be expected.

However one fixed cost category, other, and three daily expense categories, car gas, bait and tackle, and launch fees diverge from the expected norm. The greater amount spent on other items, in the fixed cost category, by boaters in the 16-25 foot range is difficult to explain. For the daily expense category car gas, medium-sized boaters (16-25 feet) again spent more than the other size boats, suggesting a longer distance traveled or that these boats were primarily trailered and caused higher auto fuel consumption.

Table 35. Average annual fixed costs and daily expenses by boat size.

	Annual Fixed Costs		
	per Boater by Boat Size (feet)		
	<16 n=172	16-25 n=429	>25 n=42
Fit Out Boat	\$ 27.26	\$118.17	\$143.62
New Items	124.77	242.26	296.90
Docking	37.35	125.04	680.24
Repairs/Maintenance	62.10	175.95	332.80
Supplies	24.12	59.29	222.02
Winter Storage	1.84	40.28	306.26
Winterizing	6.88	38.29	76.31
Insurance	25.58	130.03	320.52
Other	20.51	54.22	35.71
Total	\$330.41	\$983.53	\$2,414.38

	Average Daily Expenses		
	per Boater by Boat Size (feet)		
	<16 n=195	16-25 n=445	>25 n=46
Boat Gas	\$ 9.66	\$19.47	\$32.89
Car Gas	8.28	12.31	7.15
Snacks	7.42	12.36	17.43
Restaurants	4.55	9.07	10.59
Lodging	2.37	3.65	6.80
Bait and Tackle	6.16	6.82	5.89
Launch Fees	1.17	1.68	0.00
Other	0.19	0.38	0.48
Total	\$39.80	\$65.74	\$81.23

Launch fees were another expense category that failed to show an increase by boat size; however, this is easily explained by the fact that the larger boats are most often in the water for the entire boating season and do not pay a per trip launch fee. Surprising are the similar amounts spent on bait and tackle regardless of the size of the boat, unlike the differences discussed above which examined expenses by boating facility used.

When annual fixed costs are totaled by boat size, major differences in spending are noted. Owners of small boats (less than 16 feet) spent an average of \$330 on fixed costs during 1985; medium-sized boat owners (16-25 feet) spent an average of \$984 during 1985; and owners of large boats (greater than 25 feet) spent an average of \$2,414 on fixed cost purchases during 1985.

Total average daily expenses for all responding boaters in the sample was \$59.40. When daily expenses are totaled by boat size, notable differences are observed. Owners of boats less than 16 feet spent an average of \$39.80 on daily purchases in 1985; owners of medium-sized boats (16-25 feet) spent an average of \$65.74 per trip in 1985; and owners of large boats (greater than 25 feet) spent an average of \$81.23 for each day of boating in 1985.

CONCLUSIONS

The purpose of this study was to examine a random sample of recreational boaters who had their boats registered in Delaware in 1985. More specifically, questions were asked to describe the nature and extent of boating activity by Delaware-registered boaters during the same year. In addition, demographic information was presented, as well as boaters' motivations for boating and their perceptions of boating satisfaction. Finally, the report documented yearly fixed costs and per-trip spending by boaters during 1985.

The average boater in the study had owned his or her present boat (in 1985) almost five years. They also had approximately 17 years of boating experience. Delaware-registered boaters were quite avid in their boating activity, participating an average of 34 days during the 1985 boating season. Approximately 40% of the boaters indicated that they would like to own a larger boat within five years. When asked attitudinal questions related to boat titling and licensing, only 22% favored passage of a title law in Delaware and 42% favored licensing all boat operators.

Demographic findings revealed the following information on Delaware-registered boaters in 1985. Eighty-five percent of them had at least a high school education. Thirty-five percent were white collar employees (professional/administrative positions), 31% were blue collar workers (craftsmen, skilled or semi-skilled workers), and 20% were retired individuals. Sixty-four percent of the boaters had family incomes greater than \$30,000. Sixty-six percent of the respondents lived in rural areas or in small towns and villages with fewer than 20,000 people.

Boaters were asked what the primary use of their boats was in 1985. Overwhelmingly, fishing (61%) was the dominant response. This was followed by pleasure cruising (18%), and a very small percentage (3%) stated that water skiing was their primary boating activity.

When asked where they boated, respondents mentioned two Delaware water bodies as being the most popular. Fifty-five percent of the boaters mentioned that they had boated in Delaware's inland bays during 1985, and 54% noted that Delaware Bay was a water body where they spent time boating. The Atlantic Ocean was used as a boating resource by 30% of Delaware-registered boaters, but accounted for only 10% of all boating activity by these boaters.

Certain motives or reasons why people enjoyed boating were also explored in the survey. Most previous boating studies reveal similar patterns when motivations are analyzed, and Delaware boaters were no exception. Delaware-registered boaters identified the following three motives, in decreasing order, as reasons for boating: to be outdoors in a natural environment; that boating is a relaxing activity; and to be with friends or family members.

Another question sought to determine whether there were specific concerns that affected boaters and their boating activity. Overall responses indicated that boaters did not have major concerns. However, the three most mentioned concerns, in decreasing order, were: that commercial fishermen catch all the fish; there are too many other boats on the water; and that boating is becoming too costly.

Results on boaters' spending provided much useful information to gauge the impacts that recreational boating has on the Delaware economy. The average Delaware-registered boater spent approximately \$902 on fixed costs (insurance, repair and maintenance, docking fees, etc.) for his boat in 1985. In addition, these boaters spent an average of \$59.40 per boating trip (34 average) on such items as boat gas, bait and tackle, and snacks.

When these average spending costs were calculated for the entire population of Delaware-registered boaters in 1985 (39,638), a significant total emerged. Total spending for annual fixed cost items approximated \$36 million and total spending for daily purchases exceeded \$80 million. Thus, the total spending by Delaware-registered boaters in 1985 totaled almost \$116 million.

This is a conservative figure for spending by all recreational boaters in Delaware, since the amortized cost of durable items

such as boats, motors, and trailers was not included. Additionally, spending by boaters who had their boats registered in other states and who also had boated in Delaware was not included as part of the total spending analysis.

An important component of the spending analysis was examining where boaters actually spent their money. Of the total \$116 million spent by Delaware-registered boaters in 1985, approximately 28% or \$32 million was spent at out-of-state locations. The remainder was spent in the three Delaware counties--New Castle (\$16 million), Kent (\$29 million) and Sussex (\$39 million).

When annual fixed cost spending (\$36 million total) was analyzed alone, approximately 35%, or in excess of \$12.6 million, was spent at out-of-state locations. Sussex County was the location for 40%, or \$14.3 million of fixed cost spending, followed by New Castle County at 18% (\$6.4 million), and Kent County at 7% (\$2.4 million).

Total daily boating expenses amounted to more than \$80 million. When the location of this spending was analyzed, a different pattern emerged. The amount of spending was greatest in Kent County for a total of \$26.6 million or 33% of the total daily expense spending. Following closely was Sussex County with \$24.7 million or 31% of total daily expense spending. Out-of-state locations accounted for 24% or \$19.5 million in spending, and New Castle County had an estimated \$9.3 million (12%) in daily spending in 1985.

In conclusion, the 1985 survey results of Delaware-registered boaters provide much useful information for many groups and organizations associated with recreational boating. First and foremost, officials with the state Boating Administration Office located within DNREC's Division of Fish and Wildlife now have a comprehensive profile of boaters who registered their boats in Delaware. They also have statistically valid information on where boaters operate their boats and how often they go boating. They can also note the level of safety that boaters employ from boaters' responses to the safety-related questions.

Members of the state's Marine Trade Association can benefit from the results by examining boaters' demographics since it may provide clues to identifying a target segment for future advertising and marketing efforts. Information related to duration of boat ownership and the type of boat that boaters would like to own five years hence, might give boat dealers ideas on future purchasing decisions by customers.

Organizations that offer safe boating courses, such as the U.S. Power Squadron and the Coast Guard Auxiliary, may be able to use the study results to better educate boaters about issues related to boating safety.

The National Weather Service and other weather reporting services should find the responses by boaters concerning weather reports of use to their forecasting personnel. Media sources, such as newspapers and A.M. and F.M. commercial radio stations, that dispatch weather information may take special precautions to provide more detailed boating weather information based on the survey results.

Finally, the Delaware Boating Council or other boating organizations may elect to identify specific issues from the study results to act on, as a group, to further promote safe and responsible boating by all boaters enjoying Delaware water bodies.

REFERENCES

- Collins, C. and S. Sedgewick. 1979. Recreational Boating in Rhode Island's Coastal Waters: A Look Forward. Marine Technical Report 75, University of Rhode Island, Coastal Resources Center, Narragansett, RI.
- Delaware Boating Council. n.d. Delaware Boating Council. Promotional brochure describing the functions of the council; Dover, DE.
- Department of Natural Resources and Environmental Control, Division of Fish and Wildlife. 1976. Results of the Boating Questionnaire, 1976. Unpublished results of a survey of Delaware-registered boaters, Dover, DE.
- Graefe, A. R. 1985. Selected Highlights from the 1983 Maryland Boater Survey. Paper presented to the Maryland Marine Trades Association; Annapolis, MD; March 7, 1985.
- Graefe, A. R. 1986. Recreational Boating. Unpublished paper prepared for the President's Commission on Americans Outdoors. Penn State University; University Park, PA.
- Marmo, A. J. 1980. National Boating Trends. In Proceedings, 1980 National Outdoor Recreation Trends Conference, General Technical Report NE-57, USDA Northeast Forest Experiment Station, Broomall, PA. p. 135-145.
- Noden, D. and T. Brown. 1977. New York Recreational Boating Survey. Report NYSSGCP-RS-77-015. Department of Natural Resources; Cornell University; Ithaca, NY.
- Rorholm, N. 1976. Boats and their People--A Study of Rhode Island Boat Owners. Marine Technical Report 52, University of Rhode Island, Narragansett, RI.
- Stynes, D. and D. Safronoff. 1982. The 1980 Michigan Recreational Boating Survey. Technical Report MICHU-SG-82-202, Michigan Sea Grant Publications, Ann Arbor, MI.
- Stynes, D., G. Brothers, D. Holocek, and D. Verbyla. 1983. Spending Patterns and Economic Impacts of Michigan Registered Boat Owners. Technical Report Michu-SG-83-210, Michigan Sea Grant Publications, Ann Arbor, MI.
- Vars, C. (Jr.) 1979. Recreational Boating in Western Oregon. Technical Report ORESU-T-79-005, Oregon State University Sea Grant Program, Corvallis, OR.

APPENDIX

DATA COLLECTION MATERIALS

Study Questionnaire

Initial Cover Letter

Postcard Reminder

Follow-Up Cover Letter



Delaware Recreational Boating Survey 1985

PLEASE PLACE YOUR COMPLETED QUESTIONNAIRE IN THE PREPAID,
SELF-ADDRESSED ENVELOPE PROVIDED AND DROP IN ANY CON-
VENIENT MAIL BOX. THANK YOU FOR YOUR HELP.

YOUR _____ HAS BEEN SELECTED IN OUR RANDOM SAMPLE OF REGISTERED
BOATS. PLEASE ANSWER THE FOLLOWING QUESTIONS WITH REGARD TO THIS BOAT.

1. What type of boat is this?

<input type="checkbox"/> Sailboat	<input type="checkbox"/> Inboard/Outboard Powerboat
<input type="checkbox"/> Inboard Powerboat	<input type="checkbox"/> Other (specify) _____
<input type="checkbox"/> Outboard Powerboat	
2. How long have you owned this particular boat? ____ years
3. How long have you participated in recreational boating? ____ years
4. What is your primary use of this boat? (Check one only.)

<input type="checkbox"/> Pleasure Cruising	<input type="checkbox"/> Waterskiing
<input type="checkbox"/> Racing	<input type="checkbox"/> Daysailing
<input type="checkbox"/> Diving	<input type="checkbox"/> Overnight Cruising
<input type="checkbox"/> Fishing	<input type="checkbox"/> Other (specify) _____
5. About what *percentage* of your total boating activity is done on: (Please place the approximate percent-
age beside each of the applicable categories.)

<input type="checkbox"/> Delaware River	
<input type="checkbox"/> Delaware Bay	
<input type="checkbox"/> Atlantic Ocean	
<input type="checkbox"/> Inland Bays (Rehoboth, Indian River, Assawoman)	
<input type="checkbox"/> Freshwater Ponds/Streams	
<input type="checkbox"/> Other (specify) _____	
100% Total	
6. Do you currently keep this boat in the water during the boating season? ____ Yes ____ No

*If yes, please answer questions 7-10.
If no, please skip to questions 11 & 12.*

7. In what type of facility do you berth this boat?

<input type="checkbox"/> State marina	<input type="checkbox"/> Your own dock
<input type="checkbox"/> Private marina	<input type="checkbox"/> Other private dock
<input type="checkbox"/> Community marina	<input type="checkbox"/> Other (specify) _____
8. In what county is your boat slip located? _____
9. On what body of water is the facility located? _____
10. About how many trips did you make between your home and your boat slip during the past boating
season? ____ trips

Proceed to question 13.

Answer the following questions only if the boat we specified on the front of this
questionnaire was *not* stored in the water during the past boating season.

11. At what type of facility do you launch this boat. (please check all that apply.)

<input type="checkbox"/> Public launch ramp	<input type="checkbox"/> Private launch ramp
<input type="checkbox"/> Ramp at a marina	<input type="checkbox"/> Other (specify) _____
<input type="checkbox"/> Community launch ramp	

12. We would like to know more about the type and location of launch facilities you use. Please complete the following information for each launch ramp you used during the past boating season.

Name or Location of Ramp	On What Body of Water is the Ramp Located	No. of Days Used During Past Season	Distance from Home (No. Miles One-Way)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Continue with question 13.

13. What type and size boat do you plan to have 5 years from now?
- | | |
|---|---|
| <input type="checkbox"/> Same type, but larger | <input type="checkbox"/> Convert from power to sail |
| <input type="checkbox"/> Same type, but smaller | <input type="checkbox"/> No boat |
| <input type="checkbox"/> Convert from sail to power | <input type="checkbox"/> Same as now |
14. If you plan to change your boat type or size, why do you want to change? _____

BELOW IS A LIST OF CONCERNS THAT MAY AFFECT YOUR BOATING ACTIVITY. PLEASE CIRCLE THE NUMBER THAT BEST DESCRIBES HOW YOU ARE AFFECTED BY EACH CONCERN.

Concern	Affect On My Boating Activity				
	None	Slight	Moderate	Heavy	Great
Too many boats	1	2	3	4	5
Commercial shipping causes safety and navigation problems	1	2	3	4	5
Commercial fishermen catch all the fish	1	2	3	4	5
Too many other sportfishermen	1	2	3	4	5
Boating is getting too costly	1	2	3	4	5
Too many rules and regulations	1	2	3	4	5
Environmental problems lessen my boating satisfaction	1	2	3	4	5
Too few places to dock boat	1	2	3	4	5
Not enough launching facilities	1	2	3	4	5
Other (specify) _____	1	2	3	4	5

15. Do you familiarize yourself with new Coast Guard regulations each year? Yes No
- 16a. Do you annually receive a Coast Guard auxiliary courtesy safety inspection? Yes No
- b. State of Delaware Courtesy Safety Inspection? Yes No
17. Have you ever taken a boating safety training course? Yes No If yes, check as many as apply.
- | | |
|--|--|
| <input type="checkbox"/> Power Squadron | <input type="checkbox"/> State of Delaware |
| <input type="checkbox"/> Coast Guard Auxiliary | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Red Cross | |
18. Are you aware of the role that the Delaware Boating Council plays in recreational boating in Delaware? Yes No
19. Do you usually try to get weather forecasts:
- a) before going out in your boat? Yes No
- b) while you are out in your boat? Yes No

PLEASE CIRCLE THE NUMBER THAT BEST DESCRIBES HOW OFTEN YOU USE VARIOUS WEATHER REPORTS.

Weather Report	Regularly	Sometimes	Never
NOAA-VHF Continuous Reporting	1	2	3
Marine Operator	1	2	3
AM Commercial Radio	1	2	3
FM Commercial Radio	1	2	3
Univ. of Del. Mariners' Reporting Program (MAREP)	1	2	3
Newspapers	1	2	3
Telephone Weather Information	1	2	3
Ask Other People	1	2	3
Coast Guard	1	2	3
Other (specify) _____	1	2	3

20. Do you feel your access to weather information is satisfactory? Yes No
 If no, what changes would you suggest? _____

IN THIS SECTION WE WOULD LIKE TO FIND OUT ABOUT YOUR BOATING EXPENSES. PLEASE LIST YOUR EXPENSES ASSOCIATED WITH OWNING AND USING YOUR BOAT DURING THE PAST YEAR—MAKING IT READY LAST SPRING, USING IT DURING THE BOATING SEASON (1985) AND HAULING AND STORING FOR THE WINTER. INCLUDE EXPENSES YOU HAD DURING THE PAST YEAR EVEN IF THEY DO NOT OCCUR EVERY YEAR; THEN PLEASE INDICATE WHERE THE ITEM WAS PURCHASED.

21. Item	Amount	Where Purchased			Outside of Delaware
		Delaware (County)			
		New Castle	Kent	Sussex	
Fitting out, paints, replacements, etc.	\$ _____	_____	_____	_____	_____
New things for boat	\$ _____	_____	_____	_____	_____
Dock/moorage costs	\$ _____	_____	_____	_____	_____
Repairs/paid maintenance	\$ _____	_____	_____	_____	_____
Other supplies	\$ _____	_____	_____	_____	_____
Winter storage	\$ _____	_____	_____	_____	_____
Winterizing costs	\$ _____	_____	_____	_____	_____
Insurance	\$ _____	_____	_____	_____	_____
Other (specify) _____	\$ _____	_____	_____	_____	_____

FOR A TYPICAL DAY OF BOATING, HOW MUCH MONEY DID YOU SPEND FOR EACH OF THE FOLLOWING TYPES OF EXPENDITURES? PLEASE ESTIMATE THE AVERAGE COST FOR YOUR GROUP PER DAY, EVEN IF MOST OF YOUR BOATING IS ON LONGER CRUISES.

22. Type of Expense	Amount Spent Per Day	Where Item Was Usually Purchased (Check 1)		
		At Home	Enroute	At Waterfront
Gas/oil for boat	\$ _____	_____	_____	_____
Fuel for automobile	\$ _____	_____	_____	_____
Groceries, ice & beverages	\$ _____	_____	_____	_____
Restaurant meals	\$ _____	_____	_____	_____
Lodging or overnight fees	\$ _____	_____	_____	_____
Bait and fishing tackle	\$ _____	_____	_____	_____
Launch fees	\$ _____	_____	_____	_____
Other (specify) _____	\$ _____	_____	_____	_____

23. Approximately how many days did you use this boat during the 1985 boating season? _____ days

BELOW IS A LIST OF REASONS WHY PEOPLE GO BOATING. PLEASE CIRCLE THE NUMBER THAT INDICATES HOW IMPORTANT EACH ITEM IS TO YOU AS A REASON FOR GOING BOATING.

Reason	How Important				
	Not	Slightly	Moderately	Very	Extremely
Boating is relaxing	1	2	3	4	5
I need a boat to get to fish	1	2	3	4	5
Boating is a healthy sport	1	2	3	4	5
I like the excitement of competition	1	2	3	4	5
To get away from others	1	2	3	4	5
Experience challenge of boating	1	2	3	4	5
To be with friends or family	1	2	3	4	5
To be outdoors in natural environment	1	2	3	4	5
I like the variety of boating	1	2	3	4	5
Other (specify) _____	1	2	3	4	5

THE FOLLOWING QUESTIONS ARE ABOUT YOU PERSONALLY AND WILL HELP US TO KNOW MORE ABOUT BOATERS. WE SHOULD STRESS THAT ALL OF YOUR ANSWERS ARE STRICTLY CONFIDENTIAL.

24. What is your age? _____
 25. Are you male female?

26. How much formal education have you had?

- | | |
|--|---|
| <input type="checkbox"/> grade school | <input type="checkbox"/> some college |
| <input type="checkbox"/> some high school | <input type="checkbox"/> associate degree |
| <input type="checkbox"/> graduate high school | <input type="checkbox"/> bachelors degree |
| <input type="checkbox"/> tech or vocational school | <input type="checkbox"/> graduate school |

27. What is your occupation? _____

28. Please check the space which comes closest to your total family income before taxes.

- | | |
|---|---|
| <input type="checkbox"/> under \$10,000 | <input type="checkbox"/> \$40,000 to \$49,999 |
| <input type="checkbox"/> \$10,000 to \$19,999 | <input type="checkbox"/> \$50,000 to \$74,999 |
| <input type="checkbox"/> \$20,000 to \$29,999 | <input type="checkbox"/> \$75,000 to \$99,999 |
| <input type="checkbox"/> \$30,000 to \$39,999 | <input type="checkbox"/> \$100,000 and above |

29. Which of the following best describes the area in which you live?

- | | |
|--|---|
| <input type="checkbox"/> rural | <input type="checkbox"/> urban area, 100,000 to 250,000 people |
| <input type="checkbox"/> village/town under 20,000 people | <input type="checkbox"/> metropolitan area, over 250,000 people |
| <input type="checkbox"/> city of approximately 20,000 to 99,999 people | |

30. Delaware is a non-title state as pertains to motorboats. Would you like to see this changed so that motorboats would be titled the same as motor vehicles? Yes No

31. Do you believe a boat operator should be required to obtain an operator's license the same as a motor vehicle operator? Yes No

PLEASE FEEL FREE TO GIVE ANY ADDITIONAL COMMENTS YOU DESIRE. _____



University of Delaware

SEA GRANT COLLEGE PROGRAM
NEWARK, DELAWARE 19716

(302) 451-8083

31 October 1985

Dear Delaware Boater:

As the 1985 boating season comes to a close, the University of Delaware Sea Grant Marine Advisory Service is beginning a study of Delaware-registered boaters. Your name has been randomly selected from all boat owners who register their boats in the state. The information you provide is important because it will help to identify the economic impacts of recreational boating on the state. This information will also be useful in planning for recreational boating needs in the future.

The accuracy of this study depends on the number of questionnaires returned. Would you please take a few minutes to answer the questions on the enclosed questionnaire?

Please place your completed questionnaire in the enclosed postage-paid envelope and return it to us as promptly as possible. All responses will be handled in strict confidence. Survey data will be summarized, so there will be no way to associate your name or address with any particular set of responses.

Thank you for your interest and cooperation.

Sincerely,

A handwritten signature in cursive script that reads "J.M. Falk".

James M. Falk
Marine Recreation Specialist

/ab
Enclosure

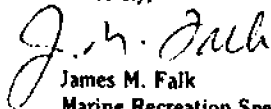
Dear Delaware Boater:

About a week ago, you should have received a questionnaire requesting information about your boating activity in Delaware. At the time this postcard was mailed, we had not yet received your response. Your answers are very important and will be used to represent the responses of many other boaters with views similar to yours.

We would greatly appreciate it if you would take a few minutes to complete the questionnaire and return it to us in the postage-paid envelope provided. If you have misplaced the questionnaire, or did not receive it, we will send you another one if we do not hear from you.

Thank you for your cooperation.

Sincerely,



James M. Falk
Marine Recreation Specialist

Note: If you have already completed and returned the questionnaire we sent you, please disregard this reminder. Thank you for your prompt response.



University of Delaware

SEA GRANT COLLEGE PROGRAM
NEWARK, DELAWARE 19716

(302) 451-8083

6 December 1985

Dear Delaware Boater:

About three weeks ago you were sent a questionnaire which is part of a study of Delaware recreational boaters. If you have already returned the questionnaire, we thank you for your prompt reply. If you have not completed the questionnaire, would you please take the time to do so today?

The accuracy of the study depends on the number of questionnaires returned. The information you provide is important because it will help to identify the economic impacts of recreational boating on the state. This information will also be useful in planning for recreational boating needs in the future. Remember, all responses will be summarized and handled in strict confidentiality.

A questionnaire and prepaid return envelope are enclosed in case you did not receive one or no longer have the first one we sent you.

Thank you again for your interest and cooperation.

Sincerely,

A handwritten signature in cursive script that reads "J. M. Falk".

James M. Falk
Marine Recreation Specialist

/ab

Enclosures: 2