

BOATING 2000: A SURVEY OF BOATER SPENDING IN MARYLAND

BY DOUGLAS W. LIPTON

Department of Agricultural and Resource Economics

University of Maryland, College Park, and Maryland Sea Grant Extension Program

Profile of Recreational Boating in Maryland and Its Economic Impact

Recreational boating represents a major activity in Maryland, one that continues to expand both in the number of registered boats and its economic impact on the state economy. To estimate that impact, the Maryland Sea Grant Extension Program undertook an analysis of boater spending in the state and its implications for marine-related businesses and the economy as a whole.

Based on 220,800 registered and documented boats in the state in 2000, the study employed a detailed survey questionnaire of boaters conducted by the University of Maryland Survey Research Center. The Department of Natural Resources Boating Administration and the Marine Trades Association of Maryland assisted in designing the survey.



Responses to the questionnaire provided measures of expenditures and spending patterns on such items as food and lodging, fishing supplies, boat fuel and transportation by owners of trailered powerboats, in-water powerboats and sailboats.

The analysis determined that recreational boaters spend more than \$2.3 billion for purchases of new equipment, annual boat-related expenses and trip-related expenses. Though some 95% of these purchases were made in-state, a significant portion of dollars spent on some purchases such as gasoline *leak* out of Maryland to other states or even other countries, that is, they do not contribute to economic activity within the state (Radke et al. 1987). When leakage is accounted for, about \$970 million directly impacts Maryland recreational boating and related business, which in turn purchase goods and services from other Maryland businesses; this spending creates an indirect impact or multiplier effect from the initial round of spending.

In addition, Maryland boater spending directly or indirectly creates income for individual workers and business owners which is spent in other Maryland industries throughout the economy, thus creating an induced impact. When the indirect and induced effects of the initial spending are taken into consideration, the impact of the Maryland economy from boater spending in 2000 was about \$1.6 billion. Recreational boating also directly accounts for 19,990 full-time equivalent jobs in Maryland and, through indirect and induced effects, a total of 28,200 jobs.

Introduction

An economic analysis of a complex industry such as recreational boating can clarify our understanding of its impact on the state's economy if estimates are based on direct measures of spending and spending patterns. This study of the industry in Maryland takes into account the purchases of new and used boats, types of boats — trailered powerboats, in-water powerboats and sailboats — equipment, the spending associated with boating activities that create employment, income and tax revenues for both the state and counties.

Recreational Boater Survey — Obtaining Data on Expenditures

Measurement of the impacts of recreational boater spending in Maryland are based on IMPLAN™ (Minnesota Implan Group 1993), an input-output model that is in wide use nationally. It is employed for assessing how expenditures generated by the boating industry affected different sectors of the state economy, for instance, the effect of boating on income and jobs.

Data for the study were obtained by a mail survey sent to 2,510 people randomly selected from the boater registration database maintained by the Maryland Department of Natural Resources. The mailings were done in four different waves between January and November, 2000: January-April (wave 1), May-June (wave 2), July-August (wave 3), September-November (wave 4). Overall, 1,163 completed surveys were collected for a response rate of 50%. Appendix 1 summarizes the dates of mailings and returns

Boaters were asked to list their boat type (trailered powerboat, in-water powerboat, or sailboat), number of trips taken during the wave being sampled, expenses per trip in several categories, including, groceries, dining, lodging, auto fuel, boat fuel, and expendable equipment such as fishing supplies. In addition, they were asked about annual costs for slip fees, maintenance, financing, new equipment and repairs. The complete questionnaire is available on the Maryland Sea Grant website, www.mdsg.umd.edu.

Total spending was calculated by adding up the average number of trips in each wave to obtain the total number of trips taken per year, and then multiplying that figure by the average expense per trip; this sum was added to the sum of the annual boat-related expense categories to obtain the overall spending for the year. These calculations were done for different categories of boats based on whether they were power or sail, trailered or kept in the water, and for different sizes. Once the total expenses for each category were obtained, they were multiplied by the number of boats in that category as determined from the boater registration database. The actual figure used in the modeling is adjusted downward 6.5% to account for multiple boat ownership. This adjustment is explained in more detail under the section Comparison with Previous Results.

Annual Trip-Related Expenditures

Table 1 summarizes trip-related expenditures for trailered powerboats, in-water powerboats and sailboats. These expenditures represent a weighted average for boats of different sizes. (A more detailed breakdown by boat size categories is available at www.mdsg.umd.edu.)

Food and lodging account for the largest expenditures. They include groceries or prepared meals brought aboard for the boat trip, restaurant meals on the way to or from the boat, restaurant meals as part of the boat outing, and lodging expenses to or from the boat or during a multi-day boat trip.¹ As expected, fishing supplies are not a major expenditure item for sailboat trips, but are for all sizes of powerboats. Boat fuel costs are highest for the larger in-water powerboats and significantly less for sailboats. Transportation is the expense of getting to and from the boating activity; these expenses are highest for those who trailer their boats and lowest for sailboaters. Table 1 summarizes the mean number of trips for each boat type and the mean expenditures by trip.

¹ Food expenses are an excellent illustration of the care that must be taken in interpreting impact analyses which rely on expenditure data. People will spend money on food regardless of whether they are on a boat outing. There is no way of knowing from the data we have collected whether they would have spent more or less on food if the boat trip was not an option. Perhaps they would have dined in an expensive restaurant and spent more money instead, or alternatively eaten peanut butter and jelly at home. One can only state that these expenditures are linked to the boating activity, not that they would disappear if the boating activity did not take place.

Table 2 gives the annual boat-related expenses which are expenses not related to the number of boat trips taken. Expenses are as expected for the different categories, with sailboats having lower engine costs, but higher equipment costs (which include sail repair or replacement). Annual boat-related expenditures for trailered boats are significantly less in every category, except of course the repair, maintenance and purchase of boat trailers. Sailboats generally had higher costs in the other categories not mentioned above than in-water powerboats, though these costs mostly reflect the fact that the average size of sailboats is larger than the average size of powerboats.

New and Used Boat Purchases

The private sale of a used boat between two individuals does not generate any new economic activity within a region unless the sale is made to someone outside the region. Offsetting those sales are purchases of boats that were previously owned outside the state. Purchases of new boats or purchases of boats made through brokers do generate new economic activity through value added and price markup and need to be included in our analysis. To estimate these expenditures, we used the Maryland Department of Natural Resources data on tax attainment, the tracking of the 5% excise tax paid on boat purchases through dealers. Tax attainment in 2000 was a record \$23 million and represents a tax on sales revenue of \$460 million; however, this amount is an underestimate since the value of a trade-in is deducted from the value that is taxed on the purchase of a new boat. An analysis of the tax attainment affected by trade-ins led us to conclude that actual sales were about 10% higher than calculated from the tax attainment. Thus, the overall spending on new and used boats purchased through dealers and brokers was \$505 million. In a 1993 study, Lipton and Miller (1995) found that approximately half the total sales were new boat purchases and half were used boats.

Expenditures by County

We do not generate estimates of economic impact by county because of the requirement for more detailed data about location of purchases, as well as county by county multiplier estimates in the IMPLAN™ model. Boaters purchasing groceries for a boat trip might buy them in the county in which they live, a county on the way to the boat or the county in which the boat is docked or launched. Rather than trying to collect this detailed data, we make a few simple assumptions about where purchases are made. For trailered boats, purchases are assigned to the county in which the owner resides. For all other boats, purchases are assigned to the county in which the boat is homeported. Table 3 reports the spending by county based on these assumptions.

Among all counties, Anne Arundel and Baltimore counties dominate the spending, accounting for 34% of boater spending. Also of note is the 20% of spending that originated from boat owners who live outside the state,

Table 1. Annual trip-related expenditures per boater in 2000.

Expenditure Category	Trailered Powerboats	In-Water Powerboats	Sailboats
Food & Lodging	\$1,857	\$2,962	\$2,302
Fishing Supplies	417	483	72
Boat Fuel	627	1,328	190
Transportation	476	425	219
Other	993	1,596	879
Total Expenditure	\$4,370	\$6,794	\$3,661
Number of Boats	114,254	86,413	20,161
Mean Trips per Boat	23	30	22
Mean Expenditures	\$190	\$227	\$166

Table 2. Annual boat-related expenditures per boater in 2000.

Expenditure Category	Trailered Powerboats	In-Water Powerboats	Sailboats
Slip/Marina/ Yacht Club	\$169	\$676	\$1,540
Dry Storage	30	128	256
Financing	493	1,324	1,364
Engine	431	700	397
Electronics	84	148	148
Equipment	115	196	732
Trailer	96	50	11
Haul/Paint/ Boatyard	39	303	545
Insurance	33	340	359
Other	124	148	186
Total	\$1,614	\$4,013	\$5,538

but register their trailered boats in Maryland. Boat sales are not included in these figures.

Economic Impacts

Details of the economic impact modeling follow the 1993 boating study (see Lipton and Miller 1995). We report here on the employment, income and total impact of recreational boater spending in Maryland.

Of the estimated \$2.3 billion spent by Maryland recreational boaters, only about \$970 million of that is available to directly impact the Maryland economy. Table 4 summarizes the multiplier effect on this initial round of spending.

Maryland businesses earn profits from boater spending, which also add to the personal income of individuals. While these impacts are included in the total impact figures, it is often important to see how a region's income is affected by an economic activity. Table 5 provides estimates of the amount of personal income and total income (personal income plus proprietor income and business profits) as well as the number of full-time equivalent jobs (FTEs) that are associated with these recreational expenditures.

Comparison with Previous Results

According to the Maryland boater registration database, there were 220,800 registered or documented boats in Maryland, a 16% increase over the 1993 figure of 190,436 boats (Lipton and Miller, 1995). Boater expenditures in 2000 were \$2.3 billion compared with \$1 billion in 1993, a 127% increase. There are several factors that may contribute to this large increase in spending, including: (1) changes in the composition of the boat fleet towards vessels that typically have higher expenditures (e.g., larger boats); (2) inflation; (3) changes in boater spending patterns; (4) change in survey methodology. The following discussion considers the impact of each of these factors on estimate of spending.

If the number of boats increased in all size and type categories in proportion to the number of boats in that category, then a 16% increase in boats would lead to a 16% increase in spending. In fact, the composition of boats in various size categories has changed. Figure 1 illustrates the changes in number of boats from 1993 to 2000.

Though boat sizes are combined to avoid cluttering, the figure illustrates the change in the fleet makeup towards more in-water powerboats than trailered powerboats and sailboats. Generally, within each of these combined categories, larger boats have increased their share of the fleet composition. In-water boats and larger boats have higher total expenditure than trailered boats and smaller boats. If we weight the increase in boats by the amount of spending in 1993 for that boat category,

Table 3. Boater expenditure by Maryland county.

County	Expenditures
Allegany	\$12,269,783
Anne Arundel	400,162,291
Baltimore City	10,412,862
Baltimore County	225,834,517
Calvert	39,777,876
Caroline	8,190,891
Carroll	37,912,764
Cecil	80,980,942
Charles	34,005,145
Dorchester	24,401,395
Frederick	31,008,290
Garrett	33,430,312
Harford	63,385,186
Howard	22,536,848
Kent	38,680,274
Montgomery	58,205,811
Prince George	54,455,230
Queen Anne's	62,773,516
St. Mary's	50,405,616
Somerset	14,616,656
Talbot	47,625,766
Washington	22,337,550
Worcester	49,409,512
Out-of-state	367,310,445

Table 4. Maryland recreational boater spending and its impact on the state's economy.

Initial spending	\$969,500,595
Direct and indirect impact	1,220,379,494
Total impact	\$1,619,286,230

Table 5. Personal income, total income and FTE jobs associated with Maryland recreational boating.

	Direct	Indirect	Induced	Total
Personal Income	\$408,949,179	\$93,238,349	\$153,739,714	\$655,927,242
Total Income	\$630,813,751	\$140,704,964	\$251,650,917	\$1,023,169,630
Jobs (FTEs)	19,895	2,763	5,554	28,212

we find that the combination of more boats and larger in-water powerboats accounts for 18.3% of the increase in spending compared with the 16% explained simply by the increase in boats. The difference is more pronounced if we weight the number of boats by the spending pattern in 2000. In this case, the change in boat fleet composition accounts for 22.6% of the spending increase.

In addition to the change in boat composition and the increase in numbers of boats there was a 19.2% increase in the overall price level from 1993-2000 as measured by the Consumer Price Index. Gasoline prices, which make up 24.6% of trip expenses, were 40% higher in 2000 than in 1993, so the impact of price inflation on boating expenditures is considerably greater than the overall rate of inflation.

It is difficult to separate the difference between the 1993 and 2000 surveys that are due to changes in spending patterns and how the survey was conducted. The 1993 survey was actually conducted in 1994, which required respondents to recall trip expenditures that occurred in the previous year. The 2000 survey was mailed out during the boating season in four waves and respondents reported expenditures that had occurred in the previous month. We believe that this shorter period of recall led to more accurate, and higher expenditure figures, than the 1993 survey.

One change in analyzing the 2000 questionnaires that led to a downward adjustment of expenditures, when compared with the 1993 survey, is our accounting for those individuals who own several boats, but were asked to respond only for their principal boat. The number of boats each respondent owned was determined directly from a survey question. Of the respondents, 24.6% indicated they owned two or more boats. To extrapolate this percentage to the population, we had to adjust for the following: since each record in the database corresponds to a single boat and not a single owner, multiple-boat owners were more likely to be part of our sample. After adjusting for this sampling bias, we determined that 81% of the boat-owning population own only one boat, 15% own two boats, 3% own three boats and 1% own four or more boats. We then assigned an adjustment factor to expenditures for second, third or fourth boats. For example, since 15% of boats owned are second boats, the expenditures for these boats were assumed to be one-half the expenditure on the primary boat. For third boats, the expenditures were 25% of primary boat expenditures, and for four or more boats, spending was 10%. Once these adjustments were made, spending was reduced by 6.5% to account for multiple boat ownership.

Conclusions

Recreational boating has grown significantly in Maryland over the past decade. Those that participate tradeoff other recreational activities and other ways that they can spend their money because the benefits they get from participating in boating exceed the monetary and time costs to participate by an amount more than the alternative activities. In other words, the economic value of recreational boating is not measured by what people spend on boating itself, but rather, the difference between the maximum amount that they would be willing to pay and still go boating, and the actual amount they have to spend. The economic impacts measured here only measure the amount that people spend, not their willingness to pay. If people could not go boating, for example, they would engage in some other recreational activity that they enjoy and incur expenses that would create economic impacts as well. However, because boating is so uniquely tied to the bays, rivers and ocean, the location of spending patterns it creates are unique and significant to the locales in which they occur. Thus, it is important to understand the linkage between the boating economy and the Maryland economy in general.

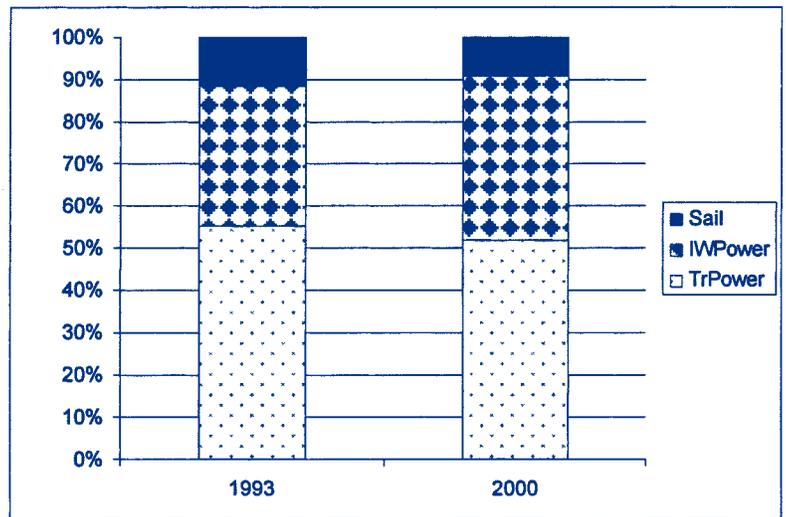


Figure 1. Change in recreational boat composition from 1993 to 2000.

Actions, regulations and events that encourage more boating will increase the expenditures in these categories and these places. For example, improvements in water quality might lead to more people getting in to boat ownership, or people who already own boats to use them more frequently. Increased boating leads to greater spending, and thus, more economic activity within the state that can be related back to boating. Finally, because boating attracts so many individuals into Maryland (36,300 non-resident boat owners), it attracts the economic income, impacts and jobs that would probably go to other states.

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Appendix — Mailing of Survey Questionnaires

There were four waves of data collection on recreational boater expenditures, covering the following periods of boat usage: January 2000 - April 2000 (wave 1), May 2000 - June 2000 (wave 2), July 2000 - August 2000 (wave 3) and September 2000 - November 2000 (wave 4). With the exception of wave 4, in which a sufficient number of returns were obtained in two mailings of the questionnaires, each wave of data collection consisted of three mailings of the questionnaire and one mailing of the reminder postcard. Table A.1 shows the dates for each mailing.

Table A.1. Mailing dates of boater questionnaires.

Wave	Period	First Mailing	Postcard	Second Mailing	Third Mailing
1	January-April	6/07/2000	6/21/2000	7/17/2000	7/28/2000
2	May-June	7/14/2000	7/28/2000	8/23/2000	9/14/2000
3	July-August	9/19/2000	10/04/2000	10/25/2000	11/30/2000
4	September-November	12/18/2000	1/09/2001	1/09/2001	N/A

Table A.2 shows the detailed disposition of 2,510 surveys by wave and in total.

Table A.2. Sample disposition and response rates.

Wave	Period	Surveys Sent	Returned	Bad Addresses	Ineligible	Rate Response
1	January-April	525	253	14	14	51%
2	May-June	525	255	29	11	53%
3	July-August	730	320	51	19	48%
4	September-November	730	336	39	11	49%
1-4	January-November	2,510	1,163	133	55	50%

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Maryland Sea Grant College Program

0112 Skinner Hall

University of Maryland System

College Park, Maryland 20742

www.mdsg.umd.edu

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