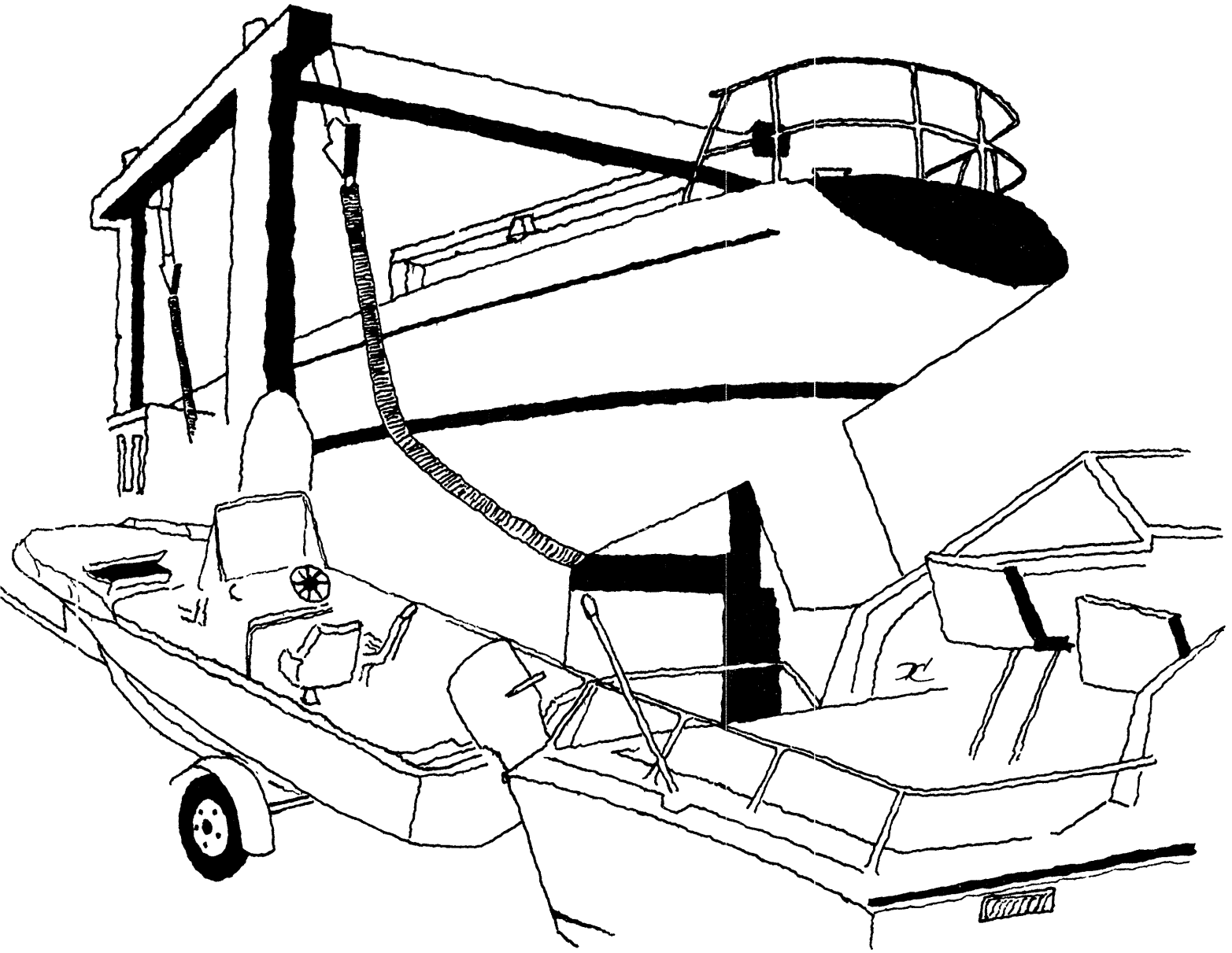
Recreational Boating in Virginia: a preliminary analysis

by TOM MURRAY
and JON LUCY



SPECIAL REPORT IN APPLIED MARINE SCIENCE AND OCEAN ENGINEERING NO. 251
VIRGINIA SEA GRANT PROGRAM, VIRGINIA INSTITUTE OF MARINE SCIENCE
College of William and Mary, Gloucester Point, VA 23062

REPORT TO THE VIRGINIA BOATING ADVISORY COMMITTEE

ACKNOWLEDGEMENTS

This report was prepared at the request of the Virginia Boating Advisory Committee under the Commonwealth of Virginia's Office of the Secretary of Commerce and Resources. The report was done at no charge to the Committee except for partial assistance with printing costs.

The authors hope the report will provide the committee with much needed basic information on the nature and significance of boating activity in Virginia. It is also hoped the report will stimulate researchers to collect additional data on recreational boating essential to achieving a comprehensive understanding of boating's impact on the Commonwealth.

Thanks go to VIMS Graduate Assistant Andre Kvaternik for assisting with data compilation and analysis and to Mrs. Cheryl Teagle for preparing draft manuscripts. VIMS Report Center assisted in preparing the final manuscript.

This project was supported by funds made available from the National Sea Grant Program, National Oceanic and Atmospheric Administration, U.S. Department of Commerce through the Virginia Graduate Marine Science Consortium.

ABSTRACT

This report was prepared in response to a request by the Virginia Boating Advisory Committee for an overview of the status and significance of recreational boating in Virginia. Due to the limited resources available to support collection and analysis of primary data on recreational boating activity, the best available national data was disaggregated for the State. In demonstrating that the basic characteristics of boats and boating activity in Virginia are comparable to those of boating nationally, the authors were able to provide a preliminary analysis of boating related expenditures in Virginia. Appropriate VIMS studies of Virginia's coastal marina industry and charter/head boat fishery were used to enhance Virginia's boating impacts derived from the available national data.

In 1980 there were 139,734 powered boats registered in Virginia, an increase of almost 25% over 1973 figures. This compares with a population increase of just under seven percent for the same period, indicating that the density of boats per capita has increased to one per every 38 people. However, since 1977 the rate of growth in Virginia boat registrations has declined from a 3.6% increase between 1976-1977 to an actual decrease (-0.5%) between 1979 and 1980. The respective county and city leading the state in numbers of registered boats are Fairfax (6,866) and Virginia Beach (8,830). Of 1980's registered boats, 95% were under 26 feet in length and 81% powered by outboards.

A conservative estimate of the total direct economic impact of recreational boating activity in Virginia is $120 million (1980 dollars). This includes estimated retail sales for all boats (except canoes, sailboats and kayaks), motors, trailers, marinas, boat fuel, head/charter boat businesses and insurance. The estimate does not take into account all boat related expenditures, indirect multiplier effects and personal property taxes collected by local governments. For example, counties/cities maintaining separate tax records for boats (representing about one-fifth of the Virginia fleet) accounted for $6 million of personal property tax revenues generated in 1980 and boat registration fees of $0.4 million in 1980.

FOREWORD

Increasingly, recreational boating and its supporting industries are being affected by governmental policy and regulatory and allocation decisions. Clearly, those charged with making these decisions cannot understand the impacts of their decisions on related business, individuals, and their livelihoods without possessing some knowledge of the general linkages between boating and local economies.

This initial estimate of the economic impacts of boating in Virginia is a first step in that direction. Hopefully, a better knowledge of the nature, recent growth and present magnitude of boating in the Commonwealth will insure that decisions made which influence its existence will be based on the best information possible.

INTRODUCTION

Virginia is for boaters. Whether whitewater canoeing in the mountains, waterskiing on picturesque Smith Mountain Lake, or sailing the thousands of miles of historic Tidewater coast lines, Virginia has it all. The Commonwealth's boats and boaters are as diverse as its waterways, together adding up to a very important part of life in Virginia. The total benefits provided by the widespread leisure activity are too numerous to count and the total value of recreational boating probably too complex to quantify. So-called "psychic" values of recreational boating (as any recreational activity) are accounted

only in the minds of the participants and as such remain too ephemeral to express in dollar terms.

Although "user value" to the recreational boater is an important and valid economic concept, for the sake of measurement a second-best attempt is necessitated herein. As the proxy for the "user value" dollar expenditures associated with boating will be accounted. For this reason the level of spending aggregated will measure the economic activity relying upon boating but will probably only provide a minimum estimate of the true "user value" of recreational boating. The difference in theory is between the boaters' "willingness to pay" and "the amount paid." The difference or "consumer surplus" is also a component of the true value of Virginia's recreational boating activity. How great this psychic value is to Virginia boaters is important but its "measurement" is better left to philosophers and politicians.

OBJECTIVES

In response to a request by the Virginia Boating Advisory Committee, this study will undertake to:

1. Provide a description of the pleasure fleet of Virginia in terms of the number of vessels, their size classes, hull construction and types of propulsion. Recent trends in these characteristics will be reviewed.

2. Based upon the physical characteristics, use patterns and boating season, comparisons will be made between the State's fleet and that of the Nation.

3. Utilizing these comparisons, projections of spending levels associated with this boating activity will be made for Virginia based upon secondary national data available and primary information for Virginia.

In analyzing an activity like boating, the first problem is one of definition. There really is no singular boating product, good or service. Boating experiences are usually a complex package comprised of numerous activities (fishing, skiing, cruising, picnicking, etc.). Thus, the definition here will be broad, accounting as completely as possible, expenditures on the main products and activities related to a recreational boat.

Review of existing secondary and primary data regarding recreational boating both nationwide and in Virginia has been completed. Fitting this data to yield comprehensive information on our fleet, its activities, and related spending will provide the best available estimate of the level of economic activity resulting from the Virginia boating public's expenditures.

To date, the only reasonably complete information on recreational boating expenditures is on the national level. Yearly retail sales estimates by the National Association of Engine and Boat Manufacturers (NAEBM), now the National Marine Manufacturers Association, for new

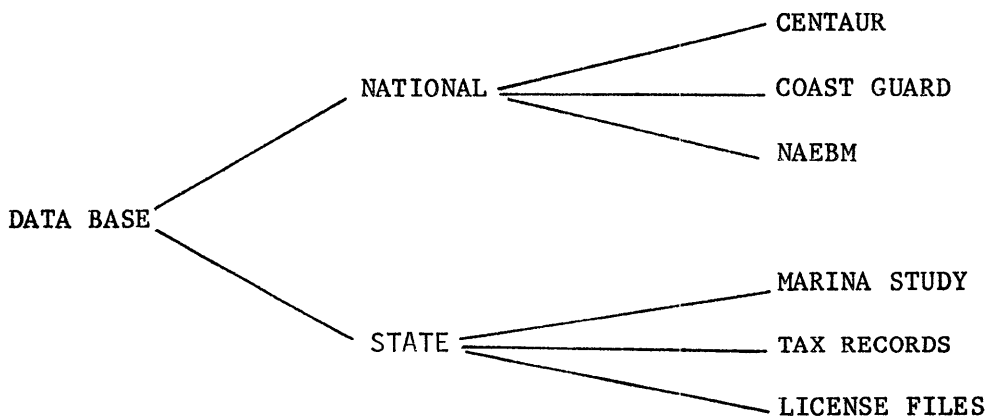
and used equipment, services, insurance, fuel, mooring, and launching fees, repairs, etc. offer an aggregate of recreational boating economic activity in terms of dollars spent.

Complementing these estimates is the work completed by Centaur Management Consultants, Inc. (C.M.C. 1977) on the 1975 "Economic Activity Associated with Marine Recreational Fishing." C.M.C. (1977) looked at total annual sales for particular fishing related goods or services at each level of economic activity (manufacturing, wholesale, retail). By totaling the various levels of economic activity associated with boating related expenditures (boats, motors, trailers, marinas, fuel, etc.), C.M.C. (1977) was able to prorate a share of that activity based upon the average percentage of boat time used for angling. Thus we may, by reversing their analysis, total sectoral expenditures on the national level for boating related industries relatively easily. Further, a brief look at so-called "respending" or multiplier effects will yield a more complete conception of the boating industries' economic importance to the State.

Using these two national partial data bases, the next step is to estimate Virginia's portion of this national activity. The primary basis for comparison of Virginia's boating activity with the U.S. relies upon a very simple reasoning. This logic presumes that if Virginia's fleet is similar to the Nation's in terms of vessel size, hull construction, types of propulsion, length of boating season, and the activities of boaters, then Virginia may be assumed a normal subset of the national fleet.

If Virginia's fleet is comparable to the Nation's in physical and use characteristics then we may assume Virginia's a "normal" component of the overall U.S. population, contributing a share of expenditures to each subsector, proportional to the national level. Simply put, if Virginia's boats, boating season and boater activities are comparable to those of the Nation then the economic activity resulting from their use is as that of the Nation: i.e. Virginia boaters spend as the Nation's boaters spend--on the average. Therefore the following data consists of a description of Virginia's boat population, comparison with the U.S. fleet and, finally, estimation of the spending associated with activities of Virginia's fleet.

METHODOLOGY

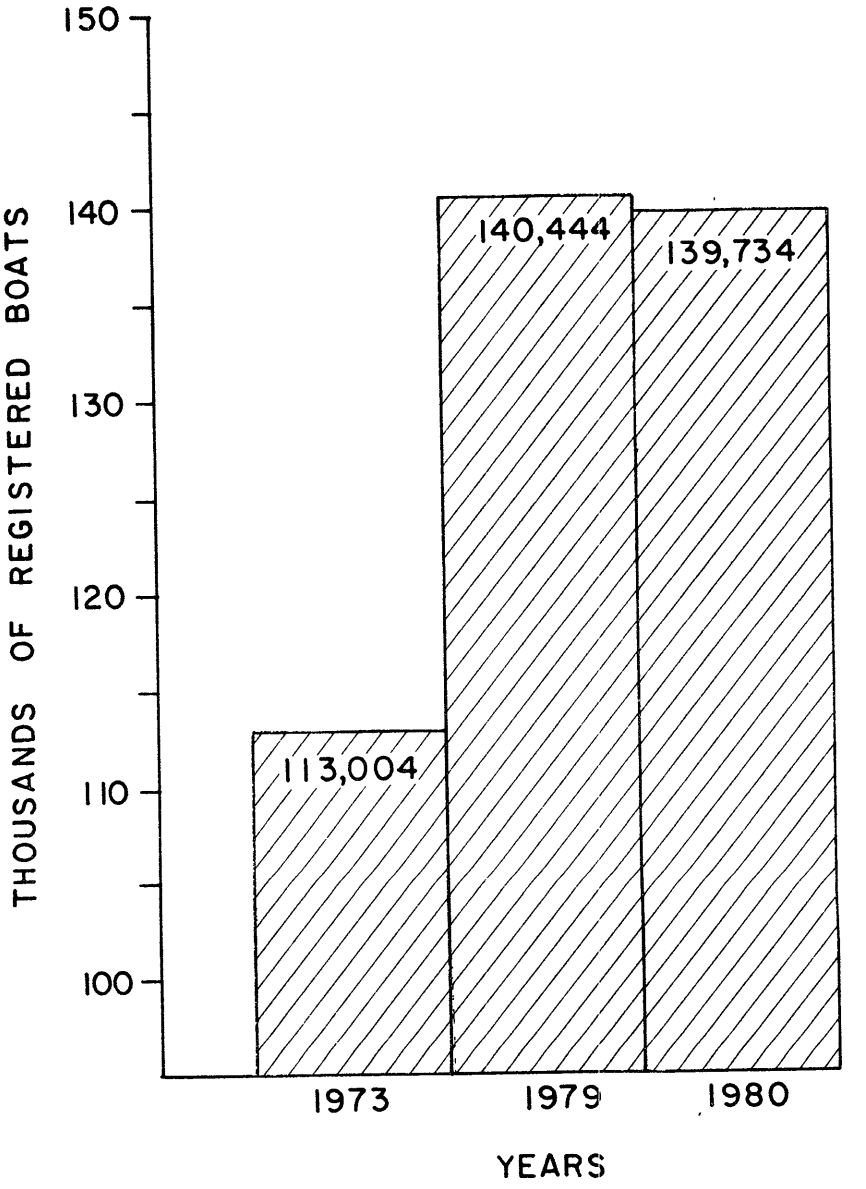


THE FLEET

As displayed in Figure 1 and Appendix I, Virginia's fleet of registered boats have exhibited a continued growth during the decade of the seventies. As of December 31, 1980, the Commonwealth recorded

FIGURE 1.

Recent Growth in Virginia Recreational Boating Fleet (1973-1980)



139,734 boats. This figure represents almost a 25% increase from 1973 when just over 113,000 motor boats were licensed.[1]

Further, over this same time period the State's population has increased a total of just under seven percent. Not only has Virginia's population expanded at a rapid rate, but its people are increasingly boat oriented. Put another way, the density of boats per capita has increased from one for every 43 people in 1973 to one for every 38 today.

Although the number of boats registered in Virginia has grown substantially over the decade of the seventies, this rapid rate of increase has begun to slow down since 1977. For example, as can be seen in Appendix II, the growth in boat registrations slowed in both absolute and percentage terms over the last 5 years.

Between 1976 and 1977 registration grew by about 1,750 boats (3.6%). The period 1978-1979 shows a net increase of only 1,021 boats (0.7%). Most recently, 1980 registrations actually declined from the previous year by 710 boats (0.5% decrease). New registrations, in comparison to transfers and renewals, have also declined from 1975-1979 (Appendix III).

---

[1]Because of a change in registration requirements in 1972 a more historical comparison is not possible. Before 1972 only motorized boats of greater than 10 hp were registered. Since that time all motor powered boats have been required to register.

For 1980, the leading counties and cities in Virginia for boat registrations were:

Counties		Cities	
Fairfax	6,866 boats	Va. Beach	8,830 boats
Chesterfield	5,187	Norfolk	4,726
Henrico	4,342	Chesapeake	3,680
Accomac	3,943	Hampton	3,090
Prince William	3,920	Richmond	2,896

The largest concentration of boats is in the Virginia Beach area which has 6.3% of all boats registered in the state.

Figures 2-4 depict Virginia's fleet vessel size characteristics and recent trends in vessel propulsion type and hull construction, according to figures provided by the Virginia Commission of Game and Inland Fisheries. In 1980 most boats were under 26 feet (95%), powered by outboard motor (81%) and constructed of either fiberglass or aluminum (87%). The trend seems to be away from wooden hulls and primarily toward fiberglass. Growth in aluminum hull construction has been consistent, but has not increased on the margin as rapidly as fiberglass. Propulsion has shown no major changes of recent, the growth in inboard motors experienced during the early seventies having apparently reached a plateau. As seen in Appendix IV, Virginia's fleet is very similar to the Nation's in physical terms (size, hull material and propulsion systems).

FIGURE 2.

Virginia's Pleasure Boats by Size

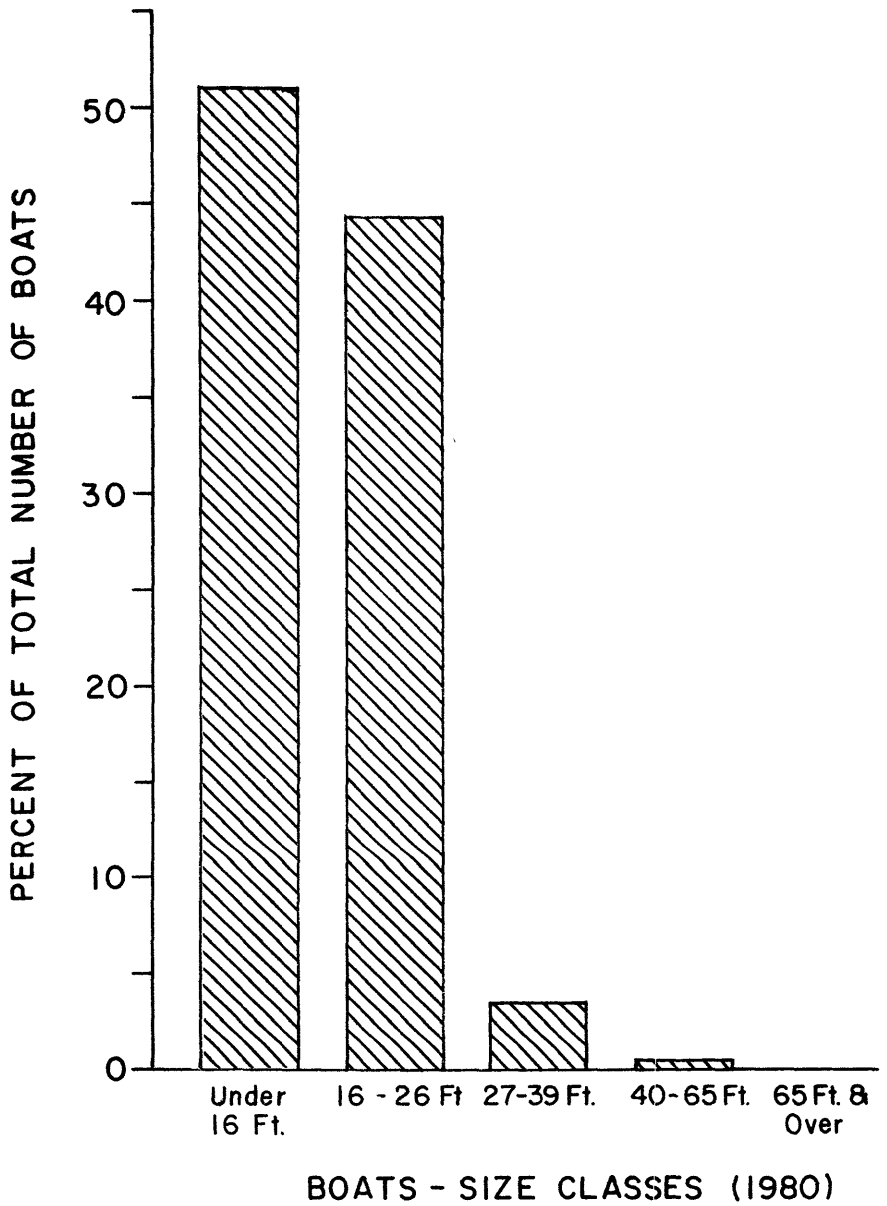


FIGURE 3.

Virginia's Pleasure Boats by Hull Material

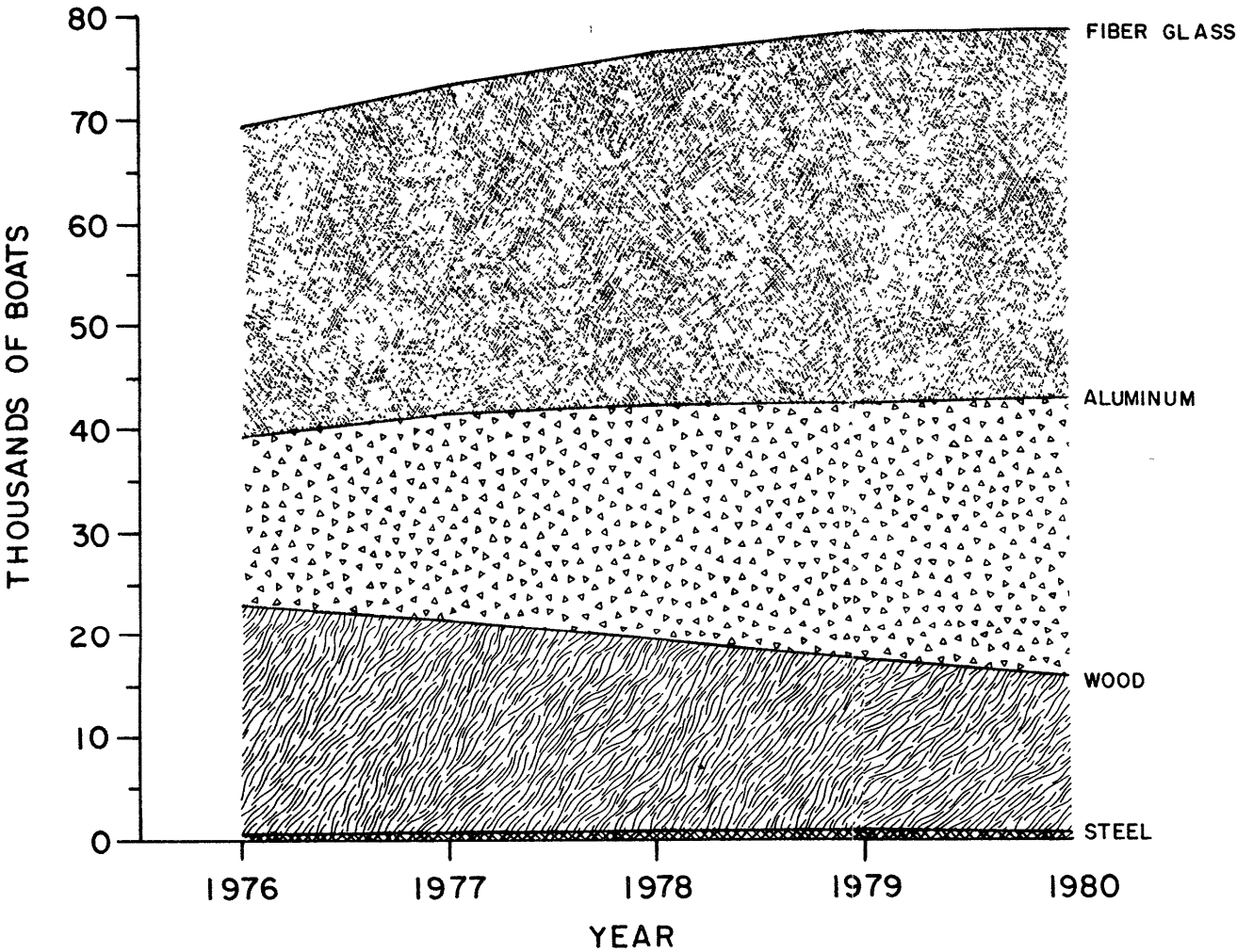
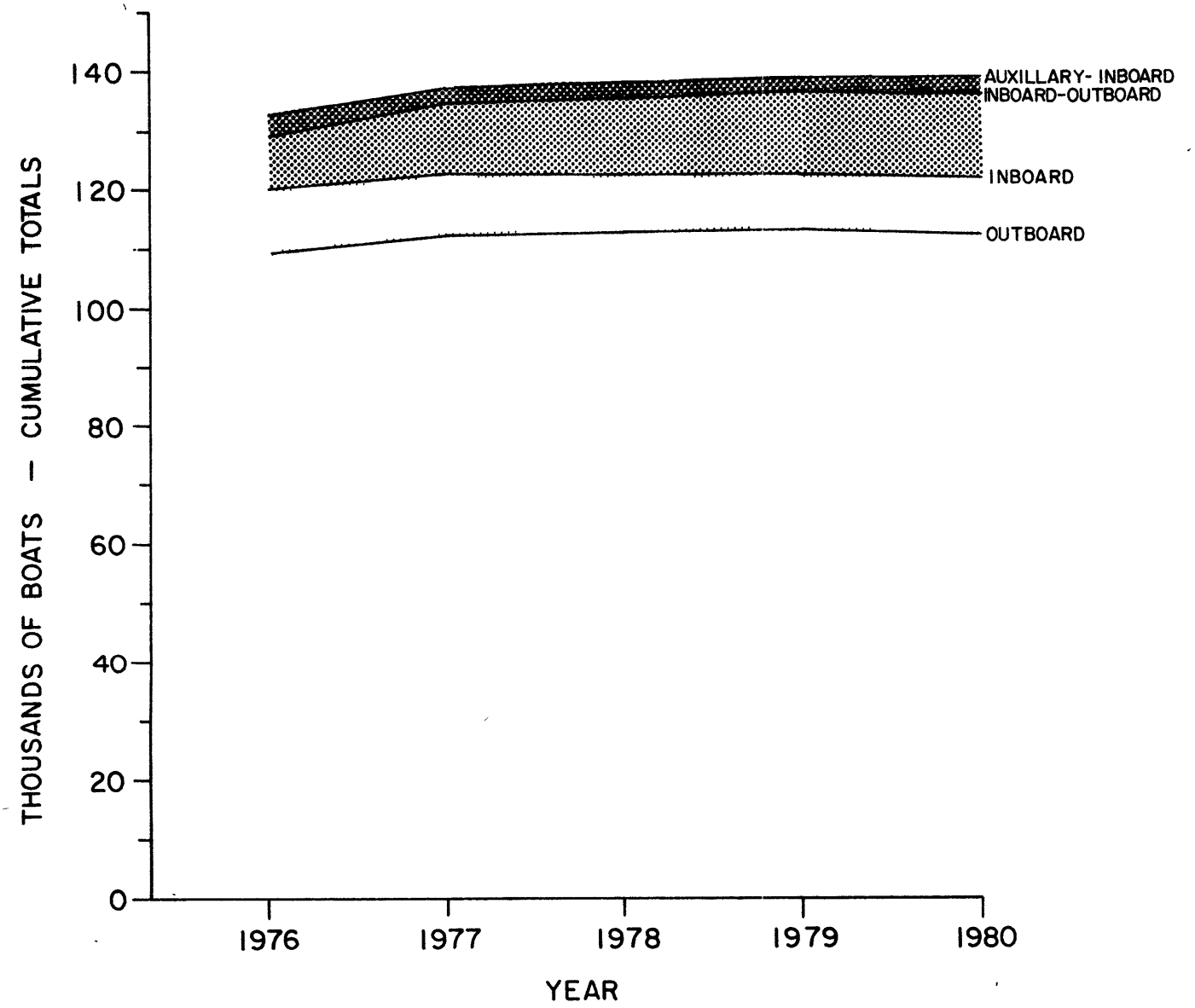


FIGURE 4.

Virginia's Pleasure Boats by Propulsion Type



Two other factors must be identified before comparisons of associated economic activity can be made between Virginia and the rest of the Nation. Specifically, we need to know how these boats are used and over what period of time. To complete the picture of Virginia's pleasure fleet requires a knowledge of the boating activity patterns and the length of the boating season.

According to the survey of marinas conducted by VIMS in 1978, Virginia's pleasure fleet is used principally from mid-April to late October--about 6 months (Lucy, 1979). This compares reasonably with the reported seasons for the U.S. boating public in general. According to Coast Guard interviews with boating households nationwide, the typical boater is actively pursuing his sport for five to six months per year--from May to October. Virginia's geographic location seems to put it in an "average" position nationally in terms of weather--a key variable in determinng boating activity. Virginians need not suffer the prolonged inclement weather limiting most northern boaters, nor can they enjoy the full 12 month boating season of many southern states.

Finally, comparing boating activity concludes analysis of national and state data comparability. A comparison of VIMS marina study with the results of the Coast Guard's national survey (U.S. Coast Guard, 1978), indicates Virginians are a "normal" subset of the Nation in terms of the relative amounts of boat time devoted to different activities (Table 1). In other words, Virginia's boaters seem to spend about the same amount of their time in respective activities as the average U.S. boatman.

TABLE 1

ACTIVITY	% TIME SPENT	
	U.S. (1976)	VA (1978)
Recreational Fishing	44.7	44
Cruising Sailing	31.5	27
Skiing	13.7	8
	90.0	79.0
Hunting	1.6	-
Racing	1.3	-
White Water Canoeing	1.2	-
Other Canoeing	4.6	-

ECONOMIC IMPACT ESTIMATE FOR VIRGINIA'S RECREATIONAL BOATING SECTOR AND SUPPORTING INDUSTRIES

As discussed at the outset, the purpose of this preliminary study is both descriptive and quantitative. The preceding information provides a brief description of Virginia's fleet and some indication of the activities related to boat use. We will go one step further and attempt to partially estimate the levels of spending associated with such fleet activities in a given year.

Again, there is no one "recreational boating industry" as such. Expenditures made while participating in the boating activity contribute to economic activity in a variety of sectors in Virginia and the Nation. For the sake of exposition, we will attempt to estimate the impact of this activity on sales generated in the

following sectors (C.M.C., 1977):

Boats	All recreational boats sold for use in both fresh and salt water (omitting canoes, kayaks, sailboats, houseboats, dinghies, etc.)
Motors	All outboard motors sold for use in fresh and salt water
Trailers	All boat trailers sold for use in conjunction with the above boats.
Marinas	All marinas both in fresh and salt water areas.
Boat Fuel	Fuel used in all recreational boating activity both fresh and salt water.
Commercial Sport Fishing Vessels	Saltwater Charter and Head Boat Businesses
Insurance	All recreational boat insurance for boats used in fresh and salt water.
Taxes	Public revenues generated by the assessment of property taxes on recreational boats.

Excluded from this summary of expenditures are sales associated expressly with recreational fishing activity (sale of licenses, fishing tackle and bait). Also, no attempt will be made to estimate expenditures for food, travel and lodging consumed while participating in recreational boating in Virginia or the considerable expenditures associated with boating accessories e.g. water skis, life jackets, electronic equipment, etc., except where sold at marinas.

As mentioned in the fleet comparisons, the available data is for the national level. Using a proportional estimate we may begin to get some idea of the probable scale of economic activity of the

appropriate sectors in Virginia. According to the Coast Guard (1978), Virginia's registered pleasure fleet is 1.7% of the total U.S. pleasure fleet. From the above observations we can assume that our boats and boaters are a representative sample and we'll further assume that Virginia's activity in the various support industries is a simple proportionate share of the U.S. total. This proportion is figured for Virginia (based upon C.M.C., 1977) in Table 2.

TABLE 2

COMPARISON OF SALES FOR SELECTED SECTORS ASSOCIATED WITH RECREATIONAL BOATING FOR THE U.S. AND VIRGINIA (1975 ESTIMATE)

	U.S. SALES ($1,000,000)	VIRGINIA SALES ($1,000,000)
Boats	989	16.8
Motors	411	7.0
Trailers	88	1.5
Marinas	540	9.2
Commercial Sport Fishing	122	2.07
Boat Fuel	410	7.0
Insurance	266	4.5
	$2,826	$48.07

In addition to the direct retail sales presented above, additional impacts for value added, personal income and employment

occur in other sectors of the economy serving the direct sectors.[2] These multiplier effects are obtained by C.M.C. (1977) from input/output tables of the U.S. economy. Again, the assumption herein is that Virginia shares in these in interindustry linkages observed at the national level.[3] Summarizing these multipliers for Virginia, Table 3 estimates total direct economic impacts associated with the included sectors (1975 estimate).

TABLE 3

SECTOR	RETAIL SALES ($1,000,000)	MULTIPLIER EFFECT	TOTAL SPENDING
Boats	16.8	1.24	20.83
Motors	7.0	1.24	8.68
Trailers	1.5	1.24	1.86
Commercial Sportfishing	2.07	1.88	3.9
Boat Fuel	7.0	1.22	8.5
Boat Insurance	4.5	1.32	5.9
	48.07		65.07

In Table 4 these estimates are adjusted for inflation and further improved by adding data from two studies conducted in Virginia.

---

[2]Briefly, indirect spending arises from purchases of goods and services (production inputs) in the direct sectors. Induced spending (respending) arises from the added impact of employee incomes, profits and interest arising in both the direct and indirect sector. For a more detailed explanation see Tiebout (1962).

[3]Though perhaps an heroic assumption, it is one often made in economic base analysis as a simplifying or indirect measure of economic interrelationships in local areas. For a more detailed discussion of this "location quotient" approach to economic base measurement see Tiebout (1962).

Marshall's (1981) survey of charter and head boat expenditures in 1978 reported direct impacts of about $3.5 million. Lucy (1979) surveyed commercial marinas in Virginia's coastal zone for, among other things, information on gross revenues. In 1977, Virginia's 180 coastal marinas were responsible for gross revenues of about $32 million--of this an estimated 82% or $26.24 million arose from recreational boating related sales, a substantial increase over the above estimation by C.M.C. (1977). Further adjusting the above figures for inflation, the total level of direct spending would increase to approximately $114 million in 1980 dollars (Table 4).[4]

Aside from the significant changes in the price level since 1975, additional increases (6%) in the number of boats registered since then have probably further increased the direct retail expenditure associated with recreational boating in Virginia. With these adjustments, the best available estimate of total direct economic impacts in the selected sectors is between $120 and $130 million for 1980.

Intrepretation of this estimate should be carefully qualified so as not to mislead the reader. Beyond these direct economic impact estimates should be added: 1) indirect multiplier effects from sectors which in turn provide supplies and services to the above direct sectors; 2) induced spending impacts which arise from the added

---

[4]Retail sales figures are adjusted using annual average consumer price indices (CPI) provided by the U.S. Dept. of Labor. The indices used are: CPI 1975 = 161.2; 1977 = 181.5; 1978 = 195.4; 1980 = 251.7.

TABLE 4

ESTIMATED TOTAL DIRECT ECONOMIC IMPACTS IN MAJOR SECTORS

ASSOCIATED WITH RECREATIONAL BOATING IN VIRGINIA - 1980

	RETAIL SALES 1980 dollars ($1,000,000)	DIRECT MULTIPLIER EFFECT	TOTAL DIRECT SPENDING ($1,000,000)
Boats	26.2	1.24	32.5
Motors	10.9	1.24	13.5
Trailers	2.3	1.24	2.9
Marinas[5]	20.4	1.67	34.1
Head/Charter	4.5	1.88	8.46
Boat Fuel	10.9	1.22	13.3
Boat Insurance	7.0	1.32	9.2
	82.2		113.96

impact of "respent" employee incomes, profits, and interests arising in the direct and indirect sectors as a result of boating activities.

For example, C.M.C. (1977) found that the total level of spending resulting from direct sales in recreational fishing sectors, following the multiplier or respending process, was over twice the initial expenditure. For this reason the economic impact of recreational boating in Virginia estimated here may be considered a minimum estimate.

---

[5] In addition to only covering coastal marinas the figure for marina sales reported by Lucy included sales of boats and motors. Reportedly 44% of total sales (at marinas with boat/engine sales) were comprised of boats and motors; for this reason, the figure above actually represents 56% of total marina sales having been adjusted to avoid double-counting.

Qualifications

The above estimate clearly ignores many sources of spending associated with recreational boating in Virginia. For example:

1. According to C.M.C. (1977) related spending for travel, food, and lodging would comprise 25% of all boating related spending.

2. Basing the estimates on only registered water craft ignores Virginia's extensive non-motorized fleet made up of small sailboats, canoes, kayaks, etc. Also, expenditures associated with the State's extensive fleet of medium and large sailboats are not adequately included in the estimates.

3. Expenditures by out-of-state boat owners recreating in, or passing through, the Commonwealth are unreported except for those sales which show up under various expenditure categories.

4. Virginia has a disproportionate concentration of documented yachts (1,156 or 2.3% of the total nationwide (N.A.E.B.M. 1978)). Presumably spending by these vessel owners would add significantly to the estimates.

5. Boat owners know that much of the cost of operating a boat is comprised of "do-it-yourself" projects with expenditures for inputs into boat maintenance and fitting not fully reflected herein.

Probably the most significant figure ignored so far has been the substantial level of capital invested in recreational boating. To an

economist, the capital tied up in Virginia's extensive fleet represents an additional boating expenditure in terms of opportunity cost or simply the foregone value of those dollars if invested elsewhere.

Estimates of total capital invested in boats and boating facilities are beyond the scope of this report. However, preliminary estimates of county and city property tax levies representing about one-fifth of the State's registered recreational fleet substantiate the significant capital values of the fleet. According to a telephone survey of counties and cities keeping separate records on boat related property taxes, the total revenues collected were $6.0 million for 1980. Although the methods of valuation varied, the average assessment ratio was about 4.5% of actual reported blue book value indicating a statewide capital investment in boats in the hundreds of millions of dollars. In addition to these taxes and expenditures, additional State sales taxes on retail activity and boat registration fees (about $0.4 million in 1980) were collected from the recreational boating sector.

The apparent complexity and economic significance of Virginia's boating related industries warrant rigorous analysis in the future. Primary data collection regarding specific economic interdependicies in the appropriate sectors is required to more adequately account economic activity associated with boating in Virginia.

LITERATURE CITED

Centaur Management Consultants, Inc. "Economic Activity Associated with Marine Recreational Fishing," Washington, D.C. 1977.

Lucy, Jon. "Virginia's Coastal Marina Industry: A Descriptive Analysis." Paper presented at the Second National Boating Facilities Conference, San Francisco, Calif., 1979. VIMS Contribution No. 957.

Marshall, Anne. "The socioeconomic and fisheries characteristics of Virginia's commercial sport fishery industry." Unpublished Master's Thesis, College of William and Mary, Williamsburg, Virginia. 1981.

National Association of Engine and Boat Manufacturers (N.A.E.B.M.). "Boating Registrations Statistics 1978," New York, New York.

U.S. Coast Guard. "Recreational Boating in the Continental United States in 1973 and 1976: The nationwide boating survey." U.S.D.O.T. Report CG-B-003-78, 1978.

Tiebout, Charles M. "The community economic base study." Published by Committee for Economic Development, 1962.

U.S. Dept. of Labor - Bureau of Labor Statistics. "U.S. Consumer Price Index, 1960-1980." Compiled by Economic Studies Center, Taylor Murphy Institute, University of Virginia.

APPENDIX I

COMMISSION OF GAME AND INLAND FISHERIES
BOAT REGISTRATION BY COUNTY AND CITY

COUNTY	12-31-76	12-31-77	12-31-78	12-31-79	% Total 1979	12-31-80	% Total 1980
Accomac	3,892	3,900	3,893	3,964	2.83	3,943	2.82
Albermarle	744	790	822	805	.57	827	0.60
Alleghany	194	213	239	268	.19	281	0.20
Amelia	173	177	197	208	.15	213	0.15
Amherst	328	340	326	340	.24	359	0.26
Appomattox	174	179	196	197	.14	214	0.15
Arlington	980	942	915	831	.59	795	0.57
Augusta	799	896	937	969	.69	998	0.71
Bath	100	109	111	124	.08	132	0.10
Bedford	1,836	1,976	2,085	2,125	1.50	2,236	0.60
Bland	38	44	48	50	.03	53	0.04
Botetourt	338	389	398	406	.28	427	0.30
Brunswick	439	464	500	518	.36	535	0.38
Buchanan	738	802	819	809	.57	817	0.58
Buckingham	206	220	242	268	.19	276	0.19
Campbell	984	974	973	947	.67	946	0.68
Caroline	473	503	540	561	.40	533	0.38
Carroll	290	314	330	338	.24	337	0.24
Charles City	430	441	436	472	.34	457	0.32
Charlotte	235	244	267	288	.21	295	0.21
Chesterfield	4,309	4,565	4,754	4,993	3.52	5,187	3.71
Clarke	172	188	211	210	.15	220	0.15
Craig	51	55	55	55	.03	53	0.04
Culpeper	272	312	329	348	.25	333	0.24
Cumberland	123	139	143	140	.09	137	0.10
Dickenson	531	570	583	585	.41	628	0.45
Dinwiddie	623	667	691	706	.50	720	0.52
Essex	1,067	1,100	1,082	1,076	.77	1,040	0.74
Fairfax	6,602	6,802	6,955	7,023	5.01	6,866	4.91
Fauquier	348	396	446	456	.32	405	0.29
Floyd	86	100	109	107	.07	110	0.08
Fluvanna	299	338	359	366	.26	374	0.26
Franklin	1,998	2,174	2,296	2,350	1.70	2,472	1.77
Frederick	472	475	477	476	.33	496	0.35
Giles	216	217	225	243	.17	250	0.17
Gloucester	2,312	2,365	2,418	2,494	1.80	2,540	1.81
Goochland	243	252	270	275	.20	289	0.20
Grayson	153	155	170	185	.13	191	0.14
Greene	77	92	102	119	.08	131	0.09
Greensville	450	481	475	454	.32	449	0.32
Halifax	688	746	788	784	.55	772	0.55
Hanover	1,717	1,845	1,925	1,938	1.40	1,928	1.38
Henrico	4,420	4,544	4,510	4,384	3.10	4,342	3.11
Henry	1,194	1,219	1,275	1,306	.93	1,309	0.94
Highland	5	6	9	7	.00	10	0.01
Isle of Wight	937	976	963	991	.70	1,014	0.72
James City	1,039	1,089	1,019	1,024	.73	1,022	0.73
King and Queen	368	382	402	392	.28	394	0.28
King George	619	655	664	707	.50	684	0.49
King William	654	694	695	738	.52	754	0.54
Lancaster	2,295	2,354	2,399	2,424	1.72	2,398	1.72
Lee	206	233	249	294	.21	327	0.23
Loudoun	758	816	841	848	.60	865	0.62
Louisa	754	802	831	850	.60	882	0.63
Lunenberg	242	258	275	271	.19	272	0.19
Madison	100	103	116	112	.07	121	0.08
Mathews	1,966	2,023	2,056	2,043	1.50	2,055	1.47
Mecklenburg	1,564	1,643	1,645	1,672	1.20	1,717	1.23
Middlesex	3,155	3,298	3,271	3,313	2.44	3,296	2.36

COUNTY	12-31-76	12-31-77	12-31-78	12-31-79	% Total 1979	12-31-80	% Total 1980
Montgomery	803	828	839	878	.63	925	0.66
Nelson	143	152	171	172	.12	175	0.13
New Kent	1,159	1,189	1,137	1,157	.82	1,147	0.82
Northampton	1,465	1,463	1,448	1,476	1.10	1,418	1.01
Northumberland	2,713	2,810	2,861	2,907	2.10	2,868	2.05
Nottoway	350	392	399	384	.27	416	0.29
Orange	546	577	611	643	.46	675	0.48
Page	342	353	369	360	.26	360	0.25
Patrick	223	256	272	286	.20	286	0.20
Pittsylvania	1,364	1,445	1,479	1,528	1.10	1,537	1.10
Powhatan	302	349	407	470	.33	495	0.35
Prince Edward	197	214	214	225	.16	215	0.15
Prince George	803	884	901	918	.65	912	0.65
Prince William	3,887	4,059	4,092	4,062	2.90	3,920	2.81
Pulaski	1,813	1,928	2,001	2,070	1.50	2,110	1.51
Rappahannock	47	60	64	62	.04	68	0.04
Richmond	674	655	695	702	.50	707	0.50
Roanoke	1,202	1,173	1,191	1,186	.84	1,180	0.84
Rockbridge	176	179	191	194	.14	202	0.14
Rockingham	657	726	777	774	.55	800	0.57
Russell	387	417	419	434	.31	445	0.32
Scott	151	169	188	197	.14	211	0.15
Shenandoah	412	424	438	436	.31	432	0.31
Smyth	283	311	323	325	.23	346	0.25
Southampton	923	1,009	1,016	1,008	.72	1,005	0.72
Spotsylvania	952	1,128	1,216	1,277	.91	1,274	0.91
Stafford	1,501	1,636	1,715	1,795	1.30	1,791	1.28
Surry	430	424	391	395	.28	412	0.29
Sussex	245	255	263	276	.20	298	0.21
Tazewell	703	785	829	849	.60	834	0.60
Warren	475	498	482	471	.34	459	0.32
Washington	927	1,021	1,086	1,178	.84	1,231	0.88
Westmoreland	2,736	2,898	2,944	2,957	2.15	2,900	2.08
Wise	864	950	1,001	1,134	.81	1,148	0.82
Wythe	305	314	326	325	.23	326	0.23
York	2,758	2,652	2,537	2,424	1.70	2,202	1.58

CITIES	12-31-76	12-31-77	12-31-78	12-31-79	% Total 1979	12-31-80	% Total 1980
Alexandria	1,047	1,033	1,063	1,004	.71	952	0.68
Bedford	39	52	64	135	.09	140	0.10
Bristol	128	159	173	194	.14	194	0.14
Buena Vista	48	53	54	50	.03	58	0.04
Charlottesville	525	527	520	490	.35	487	0.35
Chesapeake	3,578	3,704	3,757	3,747	2.70	3,680	2.63
Clifton Forge	52	49	47	54	.04	52	0.03
Colonial Heights	696	730	729	757	.54	759	0.54
Covington	92	101	101	107	.08	115	0.08
Danville	804	781	751	749	.53	698	0.50
Emporia	73	99	111	136	.10	136	0.10
Fairfax	580	570	538	468	.33	450	0.32
Falls Church	226	218	193	186	.13	188	0.13
Franklin	261	249	242	271	.19	270	0.19
Fredericksburg	486	482	473	492	.35	455	0.33
Galax	79	78	86	87	.06	84	0.06
Hampton	3,350	3,331	3,238	3,179	2.30	3,090	2.21
Harrisonburg	113	110	110	126	.09	135	0.10
Hopewell	1,018	1,072	1,057	996	.71	958	0.69
Lexington	11	15	16	17	.01	18	0.01
Lynchburg	536	590	648	670	.48	645	0.46
Manassas	40	81	127	154	.11	181	0.13
Manassas Park	8	20	34	39	.03	37	0.02
Martinsville	270	280	270	264	.19	259	0.19
Newport News	2,928	2,941	2,814	2,757	2.00	2,574	1.84
Norfolk	5,584	5,417	5,183	4,922	3.50	4,726	3.38
Norton	39	46	53	54	.04	57	0.04
Petersburg	877	871	807	788	.56	742	0.53
Poquoson	185	409	635	724	.52	929	0.66
Portsmouth	2,175	2,152	2,075	2,025	1.40	1,965	1.41
Radford	247	263	287	276	.20	274	0.19
Richmond	3,427	3,384	3,239	3,089	2.20	2,896	2.07
Roanoke	1,895	1,868	1,827	1,808	1.30	1,728	1.24
Salem	356	374	387	406	.29	406	0.29
South Boston	91	91	91	93	.07	89	0.06
Staunton	267	261	267	267	.19	263	0.19
Suffolk	2,186	2,222	2,182	2,121	1.50	2,118	1.52
Virginia Beach	8,456	8,713	8,904	8,946	6.40	8,830	6.32
Waynesboro	276	282	267	261	.19	265	0.19
Williamsburg	179	175	167	179	.13	201	0.14
Winchester	193	186	186	174	.12	173	0.12
Out of State	25	6	0	0	0		
TOTAL	132,830	137,674	139,423	140,444	99.98	139,734	100%

APPENDIX II*

& % Virginia Boats by Size Classes by Years

	Under 16 ft.	16<26 ft.	26<40 ft.	40<65 ft.	65 ft. and over
1976	71,540(53.9)	55,074(41.5)	5.249(4.0)	370(.30)	7(0.0)
1977	73,270(53.2)	58,084(42.3)	5,303(3.9)	376(.30)	5(0.0)
1978	72,562(52.0)	60,411(43.3)	5,360(3.8)	360(.30)	6(0.0)
1979	71,785(51.5)	62,103(44.2)	5,367(3.8)	360(.30)	6(0.0)
1980	71,267(51.0)	61,978(44.4)	5,235(3.7)	338(.20)	7(0.0)

& % Virginia Boats by Hull Material by Years

	Wood	Fiberglass	Alum.	Steel	Rubber
1976	22,956(17.4)	68,926(51.9)	39,299(29.7)	778(0.60)	281(0.30)
1977	21,497(15.6)	73,250(53.3)	41,216(30.0)	770(0.60)	308(0.22)
1978	19,168(13.7)	76,424(54.8)	42,100(30.2)	758(0.60)	321(0.20)
1979	17,463(12.4)	78,654(56.0)	42,599(30.3)	720(0.50)	358(0.30)
1980	15,902(11.4)	78,902(56.5)	43,222(31.0)	679(0.50)	395(0.30)

% Virginia Boats by Propulsion Type by Years

	Inboard	Outboard	Inb-Outb	Aux-In
1976	10,858(8.3)	109,707(82.7)	9,241(7.0)	2,434(1.9)
1977	10,469(7.6)	112,933(82.0)	11,052(8.0)	2,584(1.9)
1978	10,139(7.2)	113,122(81.1)	12,733(9.1)	2,705(1.9)
1979	9,826(7.0)	113,190(80.6)	13,940(10.0)	2,666(1.9)
1980	9,182(6.?)	112,636(81.0)	14,493(10.4)	2,514(1.8)

Total # Registered Boats in Virginia by Years

Years	Total Boats	Increase from Previous Year
1976	132,830	1.2%
1977	137,674	3.6%
1978	139,423	1.3%
1979	140,444	0.7%
1980	139,734	-0.5% (decrease)

*Basic data provided by Virginia Commission of Game and Inland Fisheries.

APPENDIX III**

New Boat Registrations Compared To Transfers and Renewals

	New*	% Total	Transfers	% Total	Renewals	% Total	Total
1975	16,607	31.8	13,471	25.8	22,099	42.4	52,177
1976	15,385	28.0	14,667	26.7	24,901	45.3	54,953
1977	14,220	29.2	14,410	29.6	20,015	41.2	48,645
1978	14,039	25.9	14,714	27.2	25,350	46.9	54,103
1979	12,612	23.2	14,098	26.0	27,566	50.8	54,266
	72,863	(27.6)	71,360	(27.0)	119,921	(45.4)	264,144

*New Boat Sales

**Basic data provided by Virginia Commission of Game and Inland Fisheries

APPENDIX IV*

1979 -- % - Virginia vs. National

Size class (%)

	Under 16	16-27	28-29	40-65	65 and Over
Virginia	54.1%	41.6%	4%	.28%	.02%
National	54.9%	41.2%	3.3%	.55%	0%

Hull Type

	Wood	Fiberglass	Alum.	Steel	Rubber
Virginia	17.3%	52.1%	29.8%	.59%	.21%
National	10	44	33%	1.4%	.60%

Propulsion

	Inboard	Outboard	In-Out	Aux-In
Virginia	8.2%	83%	7%	1.8%
National	9.3%	80%	8.7%	N/A

*Basic data taken from Virginia Commission of Game and Inland Fisheries and U.S. Coast Guard.

The College of William & Mary

VIMS
SEA
GRANT
PROGRAM