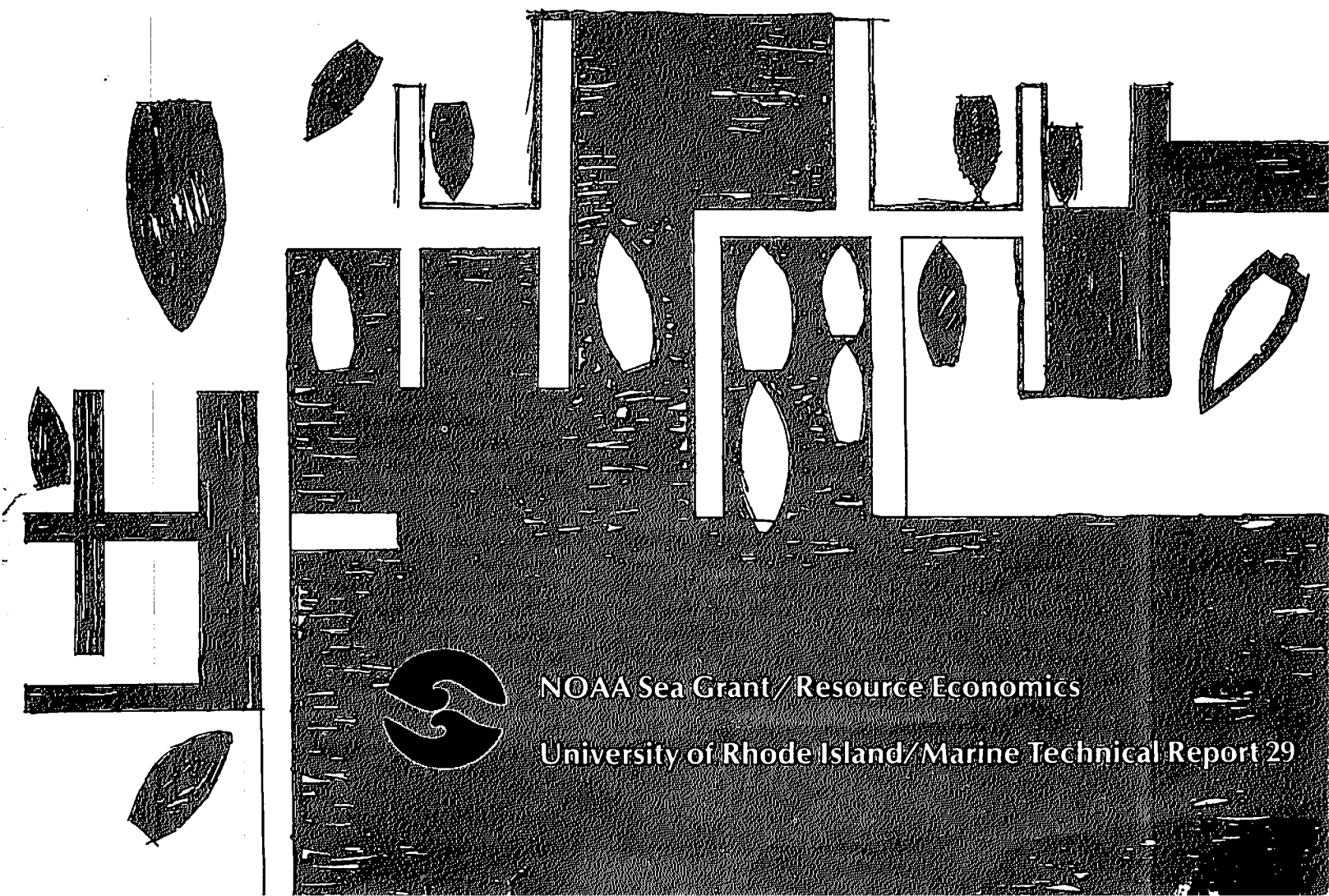
An Analysis of The Rhode Island Marina Industry

Robert Kelley
Niels Rorholm



NOAA Sea Grant/Resource Economics

University of Rhode Island/Marine Technical Report 29

An Analysis of The Rhode Island Marina Industry

Robert Kelley is a graduate student and Niels Rorholm, a professor in the Department of Resource Economics, College of Resource Development, University of Rhode Island.

This publication is a result of research partially sponsored by NOAA Office of Sea Grant, Department of Commerce, under grant 04-3-158-3. The U.S. government is authorized to produce and distribute reprints for governmental purposes notwithstanding any copyright notation that may appear hereon. Additional copies are available from the Marine Advisory Service, University of Rhode Island, Narragansett Bay Campus, Narragansett, Rhode Island 02882. *Kingston 1974*

The suitability of Rhode Island's coastal waters for recreational boating demands the attention of coastal zone planners and managers in two important respects: the protection and development of this rare environment, and the economic health and characteristics of the firms for which survival depends on continued public participation in boat-based water sports. This study addresses itself to a major source of the second concern—specifically waterfront-located, pleasure boat service firms (marinas and/or boatyards).

Pleasure boat services have become very scarce in a physical sense—the best moorings and slips are occupied and quality repair services are not universally available. They have also become scarce economically in that services have become very expensive. There is as yet no firm evidence indicating to what extent these factors have slowed down the fairly steady increase in boating participation. It will be surprising, indeed, if the recent dramatic increases in costs of fuel and boat-building materials, coupled with the shortage of space in which to keep boats, do not slow down the growth of boating.

Any reduction in growth will be difficult to prove, however. Historical statistics are not abundant, and the ways of using and keeping boats are so varied that there are very real dangers of missing different aspects of the industry in consecutive surveys. Thus, comparisons over time are difficult to make.

A reduction in the growth of boating would be welcomed by many present participants, because it would mean less increase in crowding and a slowdown in cost increases as demand pressures lessen. It would be mourned most by manufacturers and dealers in new boats and some types of equipment, but makers of other types of equipment and well-established boat service firms would be largely indifferent to this change. Some might even benefit from a growth slowdown, particularly service firms with an established clientele owning larger boats. These are the foremost employment-generating customers, but they can afford the time and money it takes to seek a less crowded marine environment away from population centers. Such areas are increasingly advertising for this trade, and observations indicate they have been somewhat successful; a slowdown in growth might keep these customers nearer home.

Thus, the firms who depend on recreational boating cannot realistically speak with one voice in the matter of boating expansion. Coastal zone decision-makers must weigh the opinions of the boating public, the public at large and various sections of the boating industry in any matter of the general management of the recreational boating environment, whether it be

marina expansion, industry location, or high-speed commuter transport.

This report describes some aspects of an important segment of the Rhode Island pleasure boat service industry which are of the most immediate interest to the coastal planning process.

From mid-March through early August of 1973 we conducted a survey of Rhode Island's marinas and boatyards. The study is limited to firms in business for profit, located on salt-water frontage, and providing some combination of summer berthing and winter storage, as well as repairs to hulls and/or motors; sale of boats, engines and marine supplies; brokerage and boat charter services, and other auxiliary activities primarily oriented to the needs of the boating public.

Non-profit organizations like yacht and boat clubs; state and municipal facilities; and manufacturers of boats, engines and marine-related equipment are not included. Similarly, only those activities directly related to recreational boating are included. For example, a firm may repair commercial or Navy vessels in addition to working on recreational craft. Insofar as is possible, only the recreational part of its business is reported here.

A total of 88 firms are identified as compatible with the defined restrictions. Of this total, six could not be located or appeared to be out-of-business. Insufficient or no data were collected from an additional 13 firms, as a consequence of their not cooperating or our inability to contact the owners or managers. The remaining 69 firms provided useful responses to the survey questions. These firms are considered as representing the waterfront-located, recreational marine industry of Rhode Island during 1972. We estimate that they represent 95 percent of the business.

Business Organization and Ownership

Forty-five firms are organized as closed corporations; none of these report having more than ten stockholders. The individual proprietorship form of business organization is used by 20 firms, and the partnership by four.

Use of these types of legal business forms has remained proportionally constant over the past three years.[1] In 1970, as now, approximately 65 percent of the industry was organized as closed corporations; 30 percent as individual proprietorships; and 5 percent as partnerships.

In an industry characterized by these business forms, it would not be surprising to find management of the firms provided by the owners or chief corporate officers. Only 11 firms employ paid managers. In all cases, it appears that the paid manager is responsible for day-to-day decisions, whereas significant changes in operations or large capital expenditures are made in concert with the absentee owner.

Over the past three years, there seems to have been an increase in the use of paid managers in Rhode Island marinas. To some extent, this reflects a centralization of marina ownership not surprising in a business that depends to a fair extent on capital gains for profits. It is too early to say whether or not this constitutes a trend.

As many as 60 percent of the firms studied were established after 1948, 40 percent after 1958, and 12 firms—or 17 percent—are less than ten years old. This testifies to the drastic post-war expansion of the marina industry.

While there has been rapid expansion, there also has been a significant rate of turnover in ownership. Thirty-six, or 52 percent, of the current owners are not the original owners of the businesses. Of those, 22, or 69 percent, acquired the firms during the past five years. The authors are not aware of any yardstick with which to judge whether this rate is high or low. Expressed as a percentage of firms surveyed, the last five years' experience of 22 purchases (sales) indicates an annual turnover rate of 6.4 percent.

There are factors in the operation of a marina that could cause rapid turnover of ownership: increasing coastal land values offering promise of capital gains, difficulty in getting and keeping skilled workers, lack of service from manufacturers or their dealers or agents and last, but not least, the pressures of long days, seven per week, of trying to keep customers satisfied while making a profit. Factors slowing down the turnover are probably fewer. Two come to mind: inertia and the fact that investments in marinas are frequently made by people who are not looking for a quick return on investment and who are attracted to the affairs of boats.

Services and Facilities

"Marina" is the term used by 35 firms to describe the array of services and facilities they make available to the boating public. For similar reasons, 19 firms describe themselves as boatyards. Shipyard, dock, landing, boat livery, transient facility, and so forth, describe the operations of the remaining 15.

Each term suggests a degree of difference in services and facilities provided. These differences are clear except between marina and boatyard. There are no

consistent distinctions made between these two terms by industry members, although boatyard connotes somewhat more attention to repair services with occasional small boat construction.

The industry's services and facilities for boats and their owners are shown in table 1. No single service is provided by all 69 firms. With the exception of showers, restaurant and brokerage, however, it is fair to say that from 75 to 80 percent of the firms can be described as "full-service marinas."

Supporting these prime areas are the unseen facilities shown in table 2. Of these, two are of more-than-average interest: sewage systems and security. The fact that 73 percent of the marinas use septic systems does not speak well for their ability to handle the potential pump-out of holding tanks should that become mandatory. Second, the high percentage (94) indicating they have adequate municipal police protection seems at variance with reports of increasing theft and vandalism on boats. But perhaps it simply indicates that routine police patrols do not effectively curb these crimes.

To meet the needs of the boat-trailering public, 18 firms provide launching and parking facilities. The use fee ranges from $1.00 to $3.00 with $2.00 the most common fee. Parking capacity for cars and trailers is approximately 1210. Many firms do not solicit business from this segment of the boating public. While a variety of reasons are given, the most common is lack of parking space. Parking space for seasonal customers and their guests is the first consideration. On a weekend, at least two cars for each boat berthed are expected, and there is simply no room for other cars and trailers.

Fifty-one firms (39 full-time, nine sales-oriented, three part-time) provide repair services for fiberglass and wooden hulls and inboard and outboard engines. The range of labor rates charged for these services is $6.00 to $13.50 per hour. The most common labor rates are $8.00 and $9.00 per hour. Several firms indicate a variable labor charge is used, depending on the type of work being done. (The labor rate is not what employees receive, but what the firm charges. The rate contains overhead costs as well as labor service payments.)

Table 1. Marina services available during 1972, Rhode Island.

Service Type	Firms Having Specified Service	
	Number	Percent
Summer Dockage	63	91
Winter Storage	60	86
Launching and Docking	52	75
Repairs	51	73
Marine Supply Store	52	75
Boat and Engine Sales	48	70
Brokerage Service	14	20
Gasoline	49	71
Oil	56	81
Fresh Water (dockside)	59	86
Electricity (dockside)	57	83
Ice	49	71
Restrooms	52	75
Showers	30	43
Restaurant	7	10

Table 2. Availability of sanitary, water and security systems, Rhode Island marinas, 1972.

Type	Firms Having Specified Service	
	Number	Percent
Head Pumping Facilities	0	0
Municipal Sewerage System	16	23
Septic Tank Systems	50	73
Other Types of Sewerage System	3	4
Municipal Water	62	90
Private Well Water System	7	10
Marina Illuminated at Night	63	91
Adequate Municipal Police Protection	65	94
24-Hour Security Provided by Firm	18	26

Employment

Labor services used by the industry are divided into three major groups: yard, office, "other." Yard labor is comprised of carpenters, painters, mechanics and general yard help. Office labor perform secretarial, accounting and managerial services. Other laborers includes salesmen, restaurant and lounge personnel, dock and gas boys. In summarizing, a part-time labor unit is considered one-half of an employee.

The industry provides employment for from 254 to 390 people (table 3). While uniformly there are more people employed in the three categories in the summer, the difference is most pronounced in the "other" category. Yard labor increases 30 percent in the summer; office labor, 14 percent; but "other," 276 percent.

On the average, a full-time marina has six employees in the summer and five in the winter. The seasonal employment pattern for the average sales-oriented firm is nine in the summer and seven in the winter. The average part-time firm employs 3.5 persons in the summer and only 0.5 in the winter.

Although each firm-type exhibits different seasonal employment patterns, the ratios of total average labor

used to total average boats served are quite similar (table 4). These ratios indicate that in general similar technology, managerial practices and resources are used by most types of firms. The ratios provide a rough guide to numbers of employees associated with number of boats. They are probably satisfactory for general planning purposes, although it should be remembered that they do not reflect use of the latest technology.

Over 20 percent of the firms report difficulty in recruiting and/or retaining skilled and conscientious yard labor. Seventeen firms report recruitment difficulties with engine mechanics; 15 firms, carpenters; 13 firms, painters; and 10, general yard help. In addition, several firms indicate replacement of their present work force would be difficult.

Numerous explanations for recruitment problems were given. The two most common are: (1) inability of the individual firm to pay a competitive wage and offer similar fringe benefits, job security, and the convenient working conditions available in other industries; (2) decreased number of skilled and competent marine-oriented craftsmen. If the latter reason given is dominant, a short-run labor shortage would exist. If the former reason is dominant, no labor shortage would exist, for increasing the wages would bid high-quality labor services away from other industries. It is not known with certainty which reason is dominant or the degree of interaction between them. Therefore, no reliable conclusions about recruitment difficulty can be made, although the authors are willing to suggest that substantial relative wage and fringe benefit increases in the industry would go a long way toward solving this problem—while probably creating others.

Table 3. Marina employment by labor and firm types, Rhode Island, 1972.

	Summer			
	Yard	Office	Other	Total
Full-time	169.5	33.5	35.0	238.0
Sales-oriented	46.0	15.0	17.0	78.0
Part-time	15.0	7.0	51.5	73.5
Total	230.5	55.5	103.5	389.5

	Winter			
	Yard	Office	Other	Total
Full-time	136.5	31.5	14.5	182.5
Sales-oriented	38.0	15.0	8.0	61.0
Part-time	3.0	2.0	5.0	10.0
Total	177.5	48.5	27.5	253.5

Summer Berthing and Winter Storage

Summer Berthing

There were 6313 berths for recreational craft during 1972. The composition by berth type and fee charged for each is given in table 5. Together, the slips and moorings rented on a seasonal basis represent 80 percent of total capacity.

Transient capacity is considered a separate berth type. These 287 spaces are not rented for the summer

Table 4. Boats handled per employee, by type of firm, Rhode Island marinas, 1972.

Firm Type	Total Average Employment	Total Average Boats Serviced[1]	Ratio of Boats Per Employee
Full-time	210.25	3362.5	15.99
Sales-oriented	69.5	961.5	13.83
Part-time	41.75	598.5	14.34

[1] *Boats berthed and moored plus boats stored in winter divided by two.*

Table 5. Number of berths and moorings and fees charged, Rhode Island, 1972.

Berth Type	Number	Fee Range	Average Fee[1]
Mooring or stake	811		
per foot per season		$ 4.00 to $ 6.00	$ 4.00
fixed charge		$50.00 to $170.00	$100.00
Breasted on dock	174		
per foot per season		$ 5.50 to $ 12.00	$ 12.00
fixed charge		N/A	N/A
Slip	4485		
per foot per season		$ 4.00 to $ 13.50	$ 8.00
fixed charge		$55.00 to $200.00	$150.00
Tie-off	141		
per foot per season		$ 3.25 to $ 9.00	$ 6.00
fixed charge		$50.00 to $175.00	N/A
Transient	287		
per foot per night		$ 0.10 to $ 0.30	$ 0.20
Unclassified[2]	415	N/A	N/A
Total	6313		

[1] *Most common or modal fee.*
[2] *No other information except number of boats.*

season to a single boat, but are rented to cruising boats for short stays. The bulk is found in Newport and Block Island, popular ports of call for cruising boats. Between Memorial Day and Labor Day, about 5000 boat nights of dockage are provided by firms with transient spaces. This is a conservative figure, for many transients use berths released by cruising Rhode Island boats, but how many is not known.

The number of boats seasonally berthed by all firms is 6026. The distribution of these boats by length class and power type is given in table 6. Over the last three years, the percentage distribution of boats by length class has remained fairly stable. Boats 16 to 26 feet in length are still the most common.

Boats with engines as their only motive power comprise over three-quarters of all those seasonally berthed. Over half are between 16 and 26 feet, and one-third between 26 and 40 feet. On the other hand, sailboats are more evenly distributed between these two length classes. Both power types exhibit similar percentage distributions in the smallest and largest classes.

The majority of all boats are berthed at full-time firms. One-third of these firms have a berthing capacity for less than 50 boats (table 7). The distribution of firms by total capacity has changed by only a few percentage points in three years. In addition, sales-oriented and part-time firms appear to be providing a greater percentage of capacity than they did three years ago. However, this may be partially due to differences in definitions used and number of firms successfully contacted in the two surveys.

The consistent increase in Rhode Island boat registrations and the slower growth in summer berthing capacity have combined to cause a berthing shortage. Currently, no firm reports vacant seasonal berths, while three years ago surplus capacity existed in one-third of the firms.

Winter Storage

During the winter months, 4139 boats are stored at 60 firms; three-quarters are kept in outside, dry storage (table 8) which is most common. The proportional distribution of boats by all storage types has not varied significantly in the last three years.

The number of firms providing each type of storage, the number of boats in each, and the fees charged are given in table 9. All firms with inside storage facilities report all available space in use, whereas only 45 percent of firms supplying outside

Table 6. Length and power characteristics of boats, 69 Rhode Island marinas, 1972.

	<16'			16' to <26'			26' to <40'			40'+			Total Length Classes		
Type of Firm	Total	Sail	Power	Total	Sail	Power	Total	Sail	Power	Total	Sail	Power	Total	Sail	Power
Full-time	160	22	138	1701	269	1432	1412	317	1095	314	70	244	3587	678	2909
Sales-oriented	44	26	18	522	223	299	245	135	110	58	4	54	869	388	481
Part-time	101	10	91	743	93	650	273	67	206	38	12	26	1155	182	973
Unclassified	N/A	–	–	N/A	–	–	N/A	–	–	N/A	–	–	415	N/A	N/A
Total	305	58	247	2966	585	2381	1930	519	1411	410	86	324	6026	1248	4363

Table 7. Number of marinas with specified summer berthing capacity, Rhode Island, 1972.

	Berthing Capacity					
Type of Firm	<50 boats	50 to 99 boats	100 to 149 boats	150 to 199 boats	200 boats & greater	Total No. of Firms
Full-time	13	8	6	9	3	39
Sales-oriented	4	2	1	–	2	9
Part-time	10	8	3	–	–	21
Total	27	18	10	9	5	69

storage report being at capacity. While winter storage facilities do not experience the pressure exerted on summer facilities, capacity is being reached. Approximately two-thirds of all firms report being at capacity, compared with about one-half of all firms three years ago. Most firms offering in-the-water storage report that they are at capacity. Observation, however, indicates that this frequently means "as many as we want" rather than "no more room."

Boats between 26 and 40 feet long represent 56 percent of all boats stored. Compared to summer berthing data, more boats of this class are serviced in the winter than in the summer. The influx of boats from private berths or moorings, yacht clubs and other states probably accounts for this difference. Power boats comprise 65 percent of all boats stored. Their decreased dominance in numbers over sailboats, compared to summer berthing, reflects their suitability to trailering and storage at the owner's home.

Eighty percent of all boats are stored by full-time or sales-oriented firms. This is not surprising as hull and engine repair services and commissioning and decommissioning services are provided by these firms. Over the past three years, it appears part-time firms have increased their share of winter storage. A portion of this trend may be due to their practice of permitting boat owners to do all repair and maintenance tasks. Another portion may be due to definitional differences between the two surveys.

Almost one-half the firms store less than 50 boats during the winter (table 10). While all full-time and sales-oriented firms provide this service, it is available at only 60 percent of part-time firms. Part-time firms provide winter storage for only one-quarter the number of boats berthed in the summer. On the other hand, full-time and sales-oriented firms provide winter storage for 86 percent and 89 percent of their summer capacity, respectively.

It should be noted that winter storage data generated by this survey are not comparable to those in the 1970 study. In some cases, firms gave their maximum storage capacity rather than the actual number of boats in storage in 1970. For that reason, boats in winter storage reported three years ago exceed the current figure by 491. An additional uncertainty in such a comparison is that actual counts indicate most marina owners do not know the exact number of boats they store in a given winter. It is not a figure that has much importance to them; hence, they do not bother to report with great accuracy. (See table 11.)

Table 8. Storage practices and fees for hauling, storing, launching, Rhode Island, 1972.

Storage	Firms	No. of Boats	Fee Range	Modal Fee
Inside	26	657	$ 0.65–$ 1.60	$1.00 per sq. ft.
			$ 3.25–$ 12.50	$5.00 per sq. ft.
Outside	57	3101	$ 2.00–$ 7.00	$5.00 per ft.
Wet	29	381	$ 1.00–$ 7.00	$2.00 per ft.
			$30.00–$150.00	$150 per season
	(60)	4139		

Table 9. Numbers of boats stored at marinas by length and source of power, Rhode Island, 1972–73.

Length Class	Sail	Power	Total
15.9' and less	68	80	148
16' to 25.9'	481	934	1415
26' to 39.9'	805	1526	2331
40' and greater	100	145	245
Total	1454	2685	4139

Table 10. Number of firms with specified winter storage capacity, Rhode Island, 1972–73.

	Inside and Outside Capacity					
	<50 boats	50 to 99 boats	100 to 149 boats	150 to 199 boats	200+ boats	Total
Full-time	17	14	3	4	1	39
Sales-oriented	2	4	1	2	–	9
Part-time	10	2	–	–	–	12
Total	29	20	4	6	1	60

Table 11. Number of boats stored, by method of winter storage, Rhode Island, 1972.

	Inside	Outside	Wet	Total
Full-time	532	2228	312	3072
Sales-oriented	94	639	48	781
Part-time	31	234	21	286
Total	657	3101	381	4139

Expansion: Past and Future

Summer Berthing

Summer berthing capacity has increased by 1033 spaces in three years. The new capacity built by 29 firms (18 full-time, 5 part-time, 6 sales-oriented) is detailed in table 12.

Expansion efforts appear substantial. However, three years ago expansion of capacity by 1700 berths was planned by 14 firms. But to obtain two-thirds of these planned objectives by existing firms required the efforts of established as well as new firms.

It is not known how many more new berths should have been constructed. The information required to formulate such an estimate is not available. However, some light can be shed on the reasons that prevented firms from achieving their goals.

In the period between surveys, annual average additions to capacity were 355 spaces, well below the peak average annual expansion of 750 spaces which was reported for 1967. Since then, annual additions to capacity have decreased each year. Then, as now, shortages existed in resources required for expansion. Included among those are suitable waterfront property and private and public capital for dredging and breakwater construction. Scarcity of these resources is expected to intensify; the implication is a declining rate of capacity expansion accompanied by increased costs. For the boat owner, this means increased difficulty in getting berthing space.

The respondents were asked to indicate their expansion plans for summer berthing capacity or winter storage. In summer berthing, 29 firms would like to add 2513 spaces ("Total Unconstrained" in table 13), but they feel that a variety of factors will probably keep that expansion down to 820 spaces ("Total Constrained"). The factors that people feel will be most to blame for this shortfall are expected inability to obtain permits, get zoning variances, and acquire the necessary land. No interpretation should be made of this information *other than this*: apparently operators would like to expand by about 2500 boats and apparently this is thought physically possible. They expect to fall short of this goal, and they feel the blame lies with problems of permits, zoning and land acquisition.

Dry stack storage has the potential for increasing a firm's summer berthing capacity. Boats are removed from the water and stored in large buildings. No firm used this method in 1972. However, several plan to handle 165 to 185 boats less than 26 feet in length by this method in the near future. As the method becomes more acceptable to the boat owner and the economic operation more familiar to firms, increased use will probably occur. This would help to alleviate the limiting effect of scarce shoreline.

Table 12. 1969–72 expansion in summer berthing capacity.

Firm Type	<16'	16' to <26'	26' to <40'	40'+	Total
Full-time	0	336	274	87	697
Sales-oriented	0	153	55	0	208
Part-time	10	93	25	0	128
Total	10	582	354	87	1033

Winter Storage

Five firms reported planned expansion of winter storage facilities by 200 boats (table 14) during the past five years. This figure may not as acutely reflect an expansion limit. Adding summer berths is expensive and requires a great deal of effort. Storing more boats on land can be accomplished by using land area more intensively or expanding to previously unused land. As 41 firms have surplus land, only minor land-clearing and grading are required to bring it into "production." In addition, the same areas can be used for parking spaces in the summer.

Future expansion of winter storage has received more attention. Again, expansion is defined in terms of "constrained and unconstrained" (table 15). Of the 18 firms with expansion plans, only five anticipate encountering deterrents, viewed by firm owners as inability to obtain variances to municipal zoning codes and acquiring more land.

Recalling the ratios of average boats serviced per employee developed earlier, and applying them to the future average number of boats firms plan to service,

Table 13. Stated plans for expansion of summer berthing capacities, Rhode Island, 1972.

	<16'		16' to <26'		26' to <40'		40'+		Total	
	C[1]	U[2]	C	U	C	U	C	U	C	U
Full-time	1	5	226	497	63	206	3	13	293	721
Sales-oriented	–	–	147	325	–	235	–	100	147	1052
Part-time	–	6	205	717	165	386	10	23	380	740
Total	1	11	578	1539	228	827	13	136	820	2513

[1] *C = constrained.*
[2] *U = unconstrained.*

reveal that between 58 and 125 more employees would be required if current ratios are maintained. In five years, the labor force would have to increase between 18 and 39 percent under the constrained and unconstrained assumptions, respectively. If a labor shortage exists, it may act as a deterrent to expansion in addition to causing a decline in the quality of services.

Other types of facility and service expansions are planned. Five firms will expand hauling services, while three firms plan expansion of retail sales, and at least one firm will add overhaul and repair services over the next five years. In addition, eight firms are contemplating the expansion of other services or facilities but have not formalized their plans.

Table 14. Past expansion of winter storage capacity.

Length Class	Number of Boats
Less than 16'	10
16' to <26'	128
26' to <40'	62
40'+	0
Total	200

Table 15. Winter storage expansion plans, Rhode Island, 1972.

	<16'		16' to <26'		26' to <40'		40'+		Total	
	C[1]	U[2]	C	U	C	U	C	U	C	U
Full-time	–	21	96	106	370	418	28	29	494	574
Part-time	–	–	13	43	–	355	–	–	305	398
Sales-oriented	–	–	100	130	–	75	–	–	100	205
Total	0	21	209	279	370	848	28	29	899	1177

[1] *C = constrained.*
[2] *U = unconstrained.*

Gross Income

Together, all firms receive an estimated gross income of $7,582,800. The activities from which gross income is received are given in table 16. In this accounting, income from sales of boats and engines includes only the dealer mark-up rather than the gross sales value. If the gross sales value were included, the total income would be $10,716,600.

Full-time firms have a gross income of $4.3 million, or 57 percent of the industry total. Sales-oriented firms contribute $1.9 million (25 percent) to the industry total, and part-time firms, $1.3 million (18 percent). The percentage of gross income derived from each activity by an "average" firm of each type is shown in table 17.

In three years, gross income within the industry has increased by $2.5 million.[2] The cause is shared by more business, more firms, and inflation. It is not possible to separate the effects of these variables without further detailed studies.

The industry derives $2,775,300 of its income from out-of-state people. Firms report receiving between 0 to 90 percent of their income from non-Rhode Islanders, but, on the average, it appears a firm receives about 36 percent of its income from non-Rhode Islanders.

Table 16. Sources and amount of gross income, Rhode Island marinas, 1972.

Income Generating Activity	Income Generated	Percent of Total
Summer dockage	$1,624,600	21.42
Winter storage (includes hauling and launching)	678,900	8.95
Repairs	1,517,300	20.01
Marine Store Sales	1,680,900	22.17
Dealer Mark-up on Boats and Engines	793,900	10.47
Brokerage Fees	149,400	1.97
All Other Sources	1,137,800	15.01
Total	$7,582,800	100.00

Table 17. Source of receipts by firm types, Rhode Island marinas, 1972.

Income Generating Activity	Full-time (Percent)	Part-time (Percent)	Sales-oriented (Percent)
Summer Dockage	23	23	13
Winter Storage (includes hauling and launching)	10	3	10
Repairs	25	4	19
Marine Store Sales	18	14	17
Dealer Mark-up on Boats and Engines	14	2	26
All Others	10	54	17
Total	(100)	(100)	(100)

A portion of gross revenue was estimated in the study because 29 firms (16 full-time, 1 sales-oriented, 12 part-time) chose not to reveal their income. Applying the technique of multiple regression to the available gross revenue information, an income-estimating equation was developed:

$$Y = -12.398 + 3.985\,(X_1) + 1.923\,(X_2) + 10.002\,(X_3) + 136.828\,(X_4)$$

where Y is estimated gross income in thousands of dollars; X_1, thousands of feet of boats in summer berths; X_2, number of boats in inside storage; X_3, average number of yard labor units employed; X_4, thousands of feet of shoreline used.[3] The relation of the variables explains 95 percent of the variation in gross income 80 percent of the time. Thus, estimates of gross income are fairly reliable.

Total estimated impact on the Rhode Island economy attributable to the presence of the industry is $12,534,600.[3] Of this amount, $6,329,800 is in the form of personal income to individuals. In addition to its gross revenues, the industry generates $4.95 million worth of economic activity in other Rhode Island and nearby industries.

Historical Note

The first economic study of Rhode Island marinas and boatyards was performed as a part of an overall investigation of the economic impact of Narragansett Bay in 1962.[4] Thus, data for this more detailed study of a part of Rhode Island's pleasure boat service industry follows by ten years the first available information.

By eliminating from the calculations for 1972 those firms not located on Narragansett Bay, it is possible to get an indication of changes over the past ten years (table 18).

For a Rhode Island population increase of 10 percent, the estimated number of boats has increased 77 percent (6 percent per year on the average). The proportion of Rhode Island boats handled by Bay marinas in the summer has declined from 40 percent in 1962 to 38 percent in 1972—also reflected in the fact that summer berths increased only 70 percent compared to the 77 percent total increase in boats.

Over the ten-year span, the average amount boat owners paid per mooring increased 150 percent; per berth with fresh water and electricity, 86 percent; and for hauling and winter storage, 108 percent. During that same period general consumer prices rose 38 percent. One should not automatically conclude from this that marina owners' profits have risen correspondingly. Their costs have increased considerably. However, while one is under development, a price index does not yet exist with which to measure this. But it is necessary to reflect only on the increases in prices of shore land, lumber, wages, and non-ferrous metals to realize that increases in marina

Table 18. Some comparisons among Narragansett Bay marina statistics for selected years.

	1962	1972	Change	
			No. or Dollars	Percent
Number of Boats at Marinas and Yards				
Summer	2,980	5,081	+ 2,101	+ 70
Slips	2,054	4,253	+ 2,199	+107
Moorings	926	828	- 98	- 10
Winter Storage	2,050	3,444	+ 1,394	+ 68
Winter Number as Percent of Summer Number	69	68	—	- 1
Average Seasonal Cost, Dollars				
Per Mooring	40.00	100.00	+ 60.00	+150
Per Berth with electricity and water	130.00	242.00	+112.00	+ 86
For hauling and storing	79.00	164.00	+ 85.00	+108
Estimated Number of Registered Boats[1]	7,420	13,150	+ 5730	+ 77
Percent of Boats Handled by Marinas	40	38		
Consumer Price Index[2]	98.8	136.6	—	+ 38
Rhode Island Population[3]	865,000	949,723	+ 84,723	+ 10
Average Length of Boat at Marina (ft.)	24.8	26.5	+ 1.7	+ 7

[1] *Pleasure boats registered or documented in Rhode Island and exceeding 10 feet in length. The numbers are about 70 percent of normally used boat numbers. They are based on actual registration counts.*

[2] *Source:* Economic Report of the President, *1973.*

[3] *Source: Bureau of the Census,* Current Population Report, *Nov. 1962 and May 1973.*

capital and operating costs have been substantial.

An additional factor increasing average costs per boat is the fact that the average size of boat kept at marinas has increased by 7 percent from 24.8 feet in length to 26.5 feet.

All the above changes are consistent with, and some are partially explained by, the increasing pressure of demand on available supply of marina services. People want to own boats badly enough that they are willing to pay the increased prices. No doubt this pressure upon facilities is exaggerated by the attraction Narragansett Bay has for out-of-state boat owners. Whereas no exact figures are available, spot checks in past years indicate that from 30 to 35 percent of the marina capacity in Narragansett Bay may be occupied on a permanent basis by boats with non-resident owners.

Table 19 gives an indication of where in the Bay expansion has taken place in the ten-year period. Proportionately, the east side of the Bay has grown most rapidly. However, of the 1393-boat-capacity added in the Bay south of Cranston-East Providence, 746 were added to the west side and 647 to the east side of the Bay. Thus, in spite of the prominence of the Bay's East Passage for visiting boats, the bulk of berthing capacity is on the west side.

Conclusion

This report began by directing the attention of town, state and coastal planners to the suitability of Rhode Island's coastal zone for boat-based recreation and to the economic activities that can be stimulated through that use.

Because society must balance trade-offs between economic and environmental well-being involved in even a single use such as boating, the report must end also with a question to these planners and to the decision-makers: Rhode Island boat service facilities are very close to being saturated; where, between the following two extremes, should we set our course? Should we:

1. Strive to accommodate as many boats as possible by granting dredging and construction permits freely and perhaps by having states or municipalities buy land for this purpose? This would generally be of maximum benefit to what is loosely called "the boating industry," though not necessarily to all parts of it. Rhode Island boating expansion under this policy would probably eventually be limited by what is frequently known as a "deterioration of the recreational experience due to crowding."

Or should we:

2. Strive to place an upper limit on the number of berths and moorings in the Rhode Island coastal zone and ensure that this limit is reached only by strict adherence to environmental and aesthetic factors? This course would generally be of environmental benefit to people who own boats and to the public at large, but not to people who are not able to find room for a boat they wish to buy. Boat owners would have to pay a good deal more, and the existing service industry would benefit economically, whereas manufacturers and dealers would not. Boating expansion would be limited by people's willingness to pay and by the supply of launching ramps, because increasing marina costs would cause more boats to be trailered to dry land locations.

Somewhere between the above extremes we hope it will be possible to find a course that will protect the boating environment while ensuring a healthy marina industry in Rhode Island.

Table 19. Comparison of summer berthing capacity, Narragansett Bay marinas, 1962–1972.

Area	Number of Boats[1] 1962[2]	1972	Percent Change
Cranston and East Providence	496	544	+ 10
Barrington, Bristol, Warren	491	874	+ 78
Newport and Portsmouth	311	670	+115
Little Compton and Tiverton	257	162[3]	- 37
East Greenwich and Jamestown	416	334[3]	- 20
North Kingstown	359	480	+ 34
Warwick	1310	2017	+ 54
Total	3640	5081	+ 40

[1] *Marinas and boatyards only; does not include yacht clubs and private facilities.*

[2] *Source:* Economic Impact of Narragansett Bay.

[3] *It seems hard to believe that a decrease has taken place. Most likely, establishments close to town borders have not been counted consistently in the correct town.*

Technical Appendix

Income Estimating Equation: The independent variables used in the equation are not only the best estimators, but also least correlated with each other. For example, use of the footage of boats in the summer and winter as variables seems logical. However, they have a high degree of interdependency and should not be used together. The relevant relations for the regression are detailed below.

Variable	Regression Coefficient	Standard Error Coefficient	Computed t	Beta Coefficient
X_1	3.98532	6.24962	0.63769	0.09337
X_2	1.92307	0.70083	2.74398	0.29383
X_3	10.00220	3.48235	2.87226	0.34555
X_4	136.82726	45.97566	2.97608	0.49121

intercept . -12.39825
multiple correlation 0.89716 (adjusted r = 0.87958)
standard error of estimate 38.00838

Analysis of Variance for the Regression

Source of Variation	d.f.	sum of square	mean square	f value
Attributable to regression	4	148987.063	37246.766	25.783
Deviation from regression	25	36115.938	1444.637	
Total	29	185103.000		

Economic Impact: Use of multipliers developed in other studies shows[5]

(Revenue from out-of-state source X 2.76) + (Revenue for in-state X .60 X 1.69) = economic impact.

Thus,

($2,775,300 X 2.76) + ($4,807,500 X .60 X 1.69) = $12,534,600.

The multipliers imply:

(1) 2.76 = dollar increase in economic activity per $1.00 increase in final demand for the output of the industry.

(2) 0.60 = "household" component of input to marina service is 0.45, and estimate for unmeasured local inputs is 0.15.

(3) 1.69 = dollar increase in economic activity per $1.00 increase in final demand for "household" services.

Personal Income: Use of multipliers developed in other studies shows[5]

(Revenue from out-of-state sources X .94) + (Revenue from in-state X .60 X 1.29) = personal income.

Thus,

($2,775,300 X .94) + ($4,807,500 X .60 X 1.29) = $6,329,800.

The multipliers imply:

(1) 0.94 = dollar returns to households (personal income) per $1.00 increase in final demand for the industry output.

(2) 0.60 = as previously defined.

(3) 1.29 = dollar increase in personal income per $1.00 increase in final demand for the output of "household" services such as wages, profits, salaries, interest, and rent.

Notes

[1] Rorholm, Niels and Sidney Feld, *Rhode Island Marinas and Boat Yards 1970.* Pub. P-16 NEMRIP, University of Rhode Island, Kingston, January 1971.

[2] Gross income of $8 million was reported in the previous survey. However, that figure included $1.9 million of commercial marine as opposed to pleasure boat services and about $1.2 million in retail value of boats and engines. Thus, the $8 million figure was adjusted to facilitate this comparison.

[3] For more detail see the Technical Appendix.

[4] Rorholm, Niels, *Economic Impact of Narragansett Bay.* Bulletin 374, University of Rhode Island, Agricultural Experiment Station, Kingston, December 1963.

[5] Rorholm, Niels et al., *Economic Impact of Marine-Oriented Activities–A Study of the Southern New England Marine Region,* Economics of Marine Resources No. 7, University of Rhode Island, Kingston, 1967.