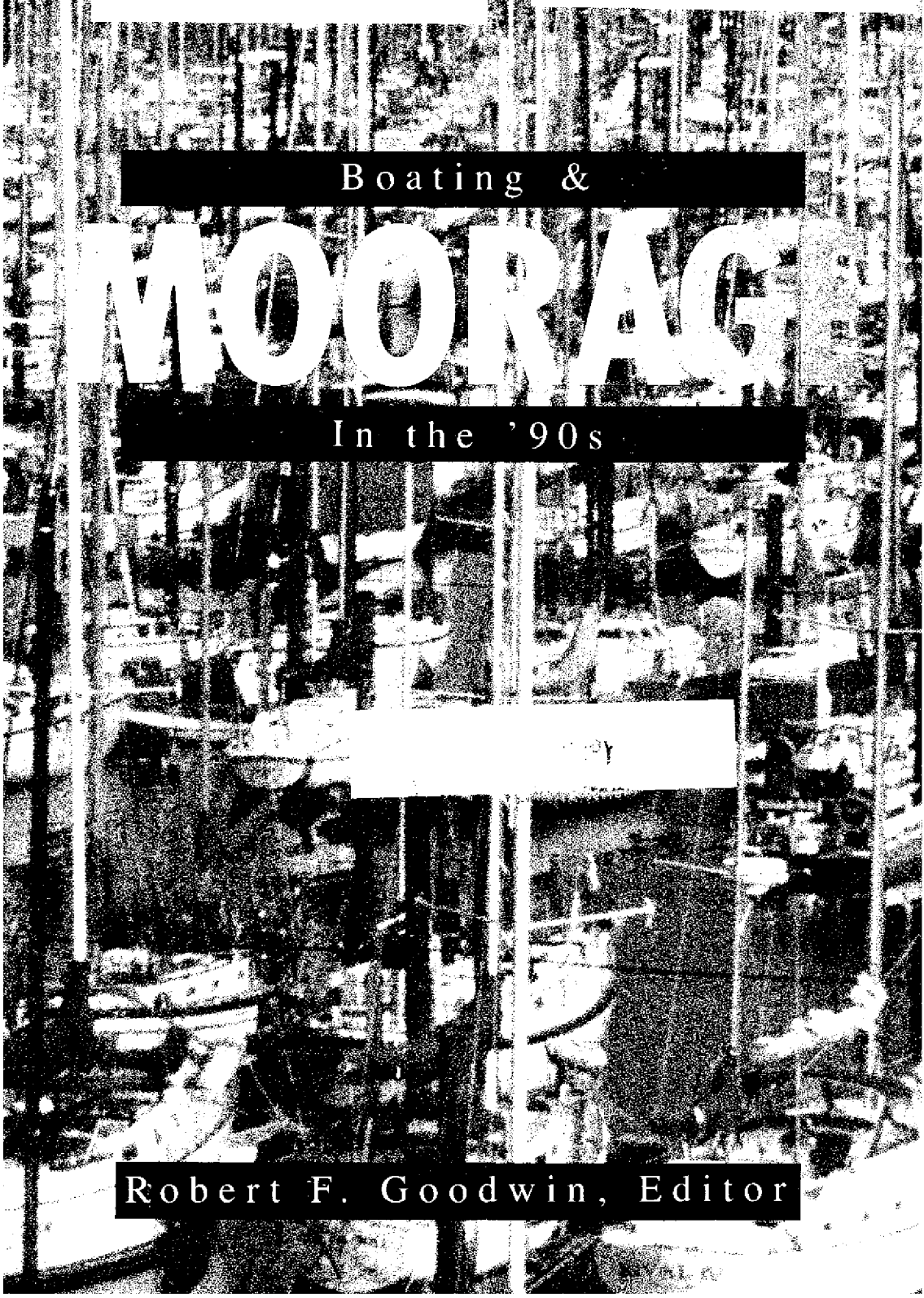

Boating & MOORAGE In the '90s

Robert F. Goodwin, Editor

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Preface

At Washington Sea Grant's **Boating and Moorage in the '80s** conference held in Seattle in Fall 1981, industry's concern was for the state of the economy: Boat sales were being driven down from their highest ever levels in 1979 by record high interest rates and declining personal income. By the end of 1982 statewide sales would be down 50% before beginning a slow, but consistent recovery. Sales have risen every year since then and are expected soon to reach their pre-recessionary levels. The economy has largely recovered, though not uniformly and not everywhere — depressed areas still persist in many rural areas of Washington State, particularly some coastal and Columbia River counties.

In 1988, industry's concern was for expansion of moorage in the '90s to meet new demands from the burgeoning pleasure boat fleet. Without adequate moorage facilities, the public's access to boating would be limited and economic activity in industries supplying recreational boats and equipment would be stifled. This concern, together with the problems of siting and mitigating the impacts of new marinas, put the moorage industry in the public spotlight at a time when legislative committees and agencies were recommending new programs to clean up and protect public waters. To meet the challenges of the next decade, the industry will need political savvy, honed business skills and renewed committment to industry-wide organization — in a word, *professionalism.*

Boating and Moorage in the '90s focussed on three educational goals:

- Maintaining quality boating waters in and around our harbors
- Improving marina design and construction techniques and materials
- Enhancing professionalism in the industry

These goals are interrelated: Water quality is better protected by a marina designed to flush properly than one that isn't; dredging scheduled to avoid critical stages in the life cycle of salmon conserves fish runs; and, use of materials that minimize leaching of contaminants into the marine environment helps protect shellfish in the vicinity of the marina. The more thoroughly professional marina operators become, the more they will educate their boater tenants about the proper disposal of on-board sewage,

garbage and plastic debris; the better educated the boater, the better steward of the marine environment he or she will become. Improving the environmental performance of marinas and communicating those improvements to the public can lead to better public acceptance of the benefits boating access provides and to more public support for expanding moorage in coastal environments to improve such access.

Boating and Moorage in the '90s was the moorage industry's conference. The conference goals developed out of the conference agenda — an assemblage of topics that an industry steering committee thought important enough to include on the program. Washington Sea Grant's role was to facilitate the conference and, for the first time, to coordinate a Sea Grant event with a membership meeting of the **Pacific Coast Congress of Harbormasters and Port Managers.** The PCCHM&PM's Board of Directors opened to all conference registrants their traditional "Call of the Ports" during which member port managers identified issues of concern, described approaches to handling common operating problems, and discussed their plans for the future. The information shared during the "Call of the Ports" helped public and private moorage managers realize their common concerns, while identifying the important differences between their missions and management structures. Such dialogue could only serve to increase mutual understanding and respect between these public and private enterprises that *jointly* service the boater.

Robert F. Goodwin
Coastal Resources Specialist
Washington Sea Grant Marine Advisory Program
Seattle, March 1989

Keynote Speech

Keynote Speech

*Christine Gregoire**

It's a pleasure to be part of this conference and consider the concerns you are facing. Evidently, one big problem faced by your industry today is expansion: You must have more moorage space if your industry is to grow.

I think your problem really is a spot of good news both for you and for us. For you it means opportunities. It means that boaters are out there and you have a market to serve. For us, at Ecology, it means that people value the recreational opportunities of clean water and unspoiled beaches. That means *we* have a market to serve as well.

I want to discuss what we, at Ecology, are doing that will affect you as you look for ways to increase moorage, put more boats on the bay, and make your ports more economically sound. Let me start by saying that Ecology is not against marinas, or boating, or public use of beaches. As a state, however, we do have laws against pollution or misuse of waters and shorelines. Because your livelihood depends on clean waters and beautiful shorelines, I believe that every one of you wants us to take a firm stand to enforce those laws.

As your industry recovers, you are putting more and more people on the water. The potential for pollution is great, but pollution will greatly diminish the value of Washington's waters for recreation. Without clean water, we would not have a boating public. You would not need to worry about ports or marinas. I believe that you need the environmental laws to keep your industry healthy.

Department of Ecology's Mission

This spring the Department of Ecology developed a new mission statement and a twelve-point strategy for carrying it out. Ecology's mission is *to protect, preserve, and enhance Washington's environment and promote wise management of our air, land,and water for the benefit of current and future generations*. One point deals specifically with the idea that compli-

* Director, Washington State Dept. of Ecology

ance with environmental laws and regulation is compatible with a sound economy.

On Long Beach Peninsula, local folks are saying that ecology equals economy. Our work to protect their water is critical to the future of the tourist and cranberry industries. The same can be true of the boating industry. As we enforce the environmental laws, we are doing our part to protect your future livelihood. In return, we do ask you to do your part too. Let's consider specifics.

SHORELINES MANAGEMENT

Ecology administers the Federal Coastal Zone Management Act (FCZMA), passed in 1972. This statute protects the resources and ecology of the shorelines, and prevents uncoordinated and piecemeal development of the shoreline. It is implemented in this state by the Shoreline Management Act through local shoreline master programs (SMPs) These are developed by local governments and approved by Ecology.

Construction of new marinas is regulated by local SMPs and requires Ecology review. A number of marinas and shipyards have been permitted during the last few years. The shipyard project in Kirkland is a good example, demonstrating how well projects can work when developers take a positive approach to protecting the environment.

There are other success stories around the Puget Sound as well.

BOAT WASTE DISPOSAL AND RECYCLING

Ecology assisted the Port of Seattle in developing an innovative program of chemical waste collection that may be the first in the nation. The program began operation this past summer. Two collection sheds have been installed at Fishermen's Terminal and Shilshole Bay Marina. Tenants at these two smallcraft harbors can get rid of chemical wastes, which are collected under contract by a licensed disposal company. Boat maintenance waste, bottom paints, and gasoline can be disposed of in this way. At the same sites the Port also has installed waste oil tanks, a coin-operated bilge pump, a sewage pump-out station, and recycling bins for bottles and cans.

Similarly, the Port of Bellingham's recycling project appears to be moving ahead nicely. We'll hear more about that effort from Patty Mullin this afternoon.

BEST MANAGEMENT PRACTICES

Ecology is shifting its focus from large boat cleaning facilities to smaller marinas. Ecology is working with the City of Seattle and independent moorage associations around Lake Union to develop two kinds of rules: "dorm rules" for boat owners — rules marinas can post to help boat own-

ers keep pollution out of the water; and rules for marina owners and land owners.

While this effort is still at a very early stage — just a couple of meetings so far — there is already evidence of a lot of cooperation and a desire to work together to get rules we can all agree to.

In Olympia, Yacht Club members sign an agreement before using the cleaning grid, which says they will abide by laws governing use and disposal of petroleum, paint, and cleaning products. The whole area of Best Management Practices (BMPs) is a great example of industry/Ecology cooperation at work.

Ecology has been criticized for not being consistent in enforcement. With BMPs, everyone will know exactly what is expected. A marina owner in Marysville will have exactly the same rules as the owner in Seattle or Bellingham.

One of the other twelve points in the department's strategy calls for clear and even-handed enforcement: We owe you that; and best management practices will help us achieve it.

MARINE PLASTIC DEBRIS

Marine plastics constitute an area of grave concern. MARPOL Annex 5 is an international agreement prohibiting disposal of plastics at sea. Washington's 1987 Legislature passed a resolution encouraging Congress to ratify MARPOL. The President has signed the Marine Plastic Pollution Research Act to implement MARPOL, and, starting this year, the U.S. Coast Guard will levy fines for disposing of plastics at sea.

Facilities are required at certain ports to handle waste plastics, and Ecology staff are available to work with harbormasters and port staff to develop these facilities for proper recycling and disposal of wastes.

Ecology is putting more emphasis on education to prevent pollution problems. For example, we have begun putting on displays at fairs — three this fall on marine plastics. We're also working with State Parks on a marine plastics flyer to go into boater licensing renewals.

And, again, the Port of Seattle is leading the way in pollution prevention: the Port will be stenciling all port storm drains with a new Ecology stencil —

"DUMP NO WASTE — DRAINS TO BAY"

Ecology provides stencils free of charge and we will be glad to help your port with a similar project.

Forging a New Partnership

As you can see, there are many places where your interests and ours are similar. And there are some places where state laws are going to rub

against your short-term interests — I ask you to keep in mind your long-term goals as an industry.

Yes, it may take you longer to design and build marinas that comply with state laws. Yes, it may be more expensive in the short run. But in the long run, you will be protecting your most valuable asset — *the environment of the state.*

State laws are not always easy to follow — but they are there for a very important purpose: *to protect our water and air and land.*

The flyer for this conference says that professionalism is the key to meeting the challenges of the next decade. I agree that professionalism is important - for you and for Ecology. But I say the key is partnerships. It's in the best interests of industry and the state as a whole to cooperate. Let's work together to preserve and protect the resources of this state so that your industry can continue to thrive.

Industry Review and Outlook

Boating and the Economy

*Ron Stone**

Let me start by giving you a bit of market history that explains where the boating industry stands today and where it is likely headed in terms of new product sales or boating's role in the national economy.

In the 1970s the recreational boating industry was rocked by a series of devastating events — the Arab Oil embargo, long lines at the fuel pump, the proposed weekend motorboating ban as a gesture to energy conservation, inflation, and high interest rates topping 20%. There followed a very severe recession in 1981 and 1982.

The number of boats sold in 1973 was 729,000. By 1982, the number had plummeted to 499,525. Outboard motor and IO and boat trailer sales were similarly drastically impacted.

Then came Reagonomics, tax reform, lower taxes, a lowering of the inflation rate, record employment, more discretionary income, and greater spending. For the past five years the boating industry has enjoyed good growth in terms of new product sales.

The 1987 model year, the most recent full year on record, turned out to be another top sales year for the boating industry. It was the fifth consecutive year of sales gains for the industry with all categories combined ending up 10% over 1986 which was a very good year. Never in the history of the boating industry had we experienced five good years in a row. We still had not regained the plateau in unit sales reached in the early 1970s, but total dollar sales volume was higher. Increased sales were evident across almost all product lines and we were seeing pronounced growth in overseas sales of U.S. boating products after a five year decline due to the strong dollar.

Top sales performers in the 1987 boating market continued to be the power side of the industry. Inboard motor yachts, stern drives and outboards all moved upward from the already high sales levels at which they had been performing. The most popular boating package, an outboard family runabout with motor and trailer, increased in average price during

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* Director, Government Relations Department, National Marine Manufacturers Association, Chicago

the period partly because the buyer upgraded to a better outfitted boat. Entry level no longer means a small bare-bones rig.

Florida led the nation in new product purchases as it has for the last several years followed by New York. Close to 70 million people went boating during the 1987 season. That's a lot of folks using our products.

Prior to last fall's stock market debacle, many in our industry were wondering whether we could sustain another year of growth in 1988. We came out of the stock market scare all right, and industry shipments through the first half of the year maintained the pace of those in 1987. Such a long uninterrupted period of growth has never happened before. It is still too early to make any full projections for 1988.

It is traditional for economic forecasters to talk of business activity in terms of the time span between its low and high points — which they call the business expansion phase of a business cycle, consisting of up-and-down periods. They like to point out that the average "business expansion phase" in post World War II years has lasted 32 months and that the present one is now more than twice that. The national economy grew at a 3.4% rate in 1987, and about the same is forecast for 1988. While modest in percentage terms, a 3% growth rate historically has been viewed as the maximum sustainable rate over a period of time.

Indicators for continued market advancement are very good. The fundamental economic factors for our industry are a stable energy supply outlook, credit availability at attractive interest rates, and a generally stable economic climate. All of these things help strengthen demand for boat ownership. With the baby boomers now coming of age into the 35 to 55 years old population segment — our primary market — the good news is that we have strong support for a 4% to 6% annual growth rate for boating through the year 2000.

Let's talk about some of these things in a little more detail.

Oil prices have been a drag on the economy and the boating industry in particular since the mid-1970s. Twice they have administered sharp shocks to the industry and, in between, they have depressed the consumer's discretionary income. It is the discretionary income that buys boats.

Because of the over supply of oil in the world generally, and the fact that there are more producers producing more outside of the OPEC cartel, OPEC's power is ultimately limited. It can and finally is stabilizing prices, but dramatic increases are unlikely even with Mideast unrest. Interestingly, the stabilized price at a level well below the high point of recent years will help oil-producing states like Louisiana and Texas recover from their economic recessions. When that happens, we'll be selling more boats in Texas and Louisiana than we have in the last two years.

Inflation reached a low of 1.1% in 1986 — the lowest point in 15 years. In times of high inflation the first thing to go is the consumer's discretionary income — again, it is discretionary income that buys boats. Thus, low inflation is beneficial to our industry. The good news is that low inflation is likely to continue probably in the range of 3% to 5% for the next several years. Unlike the 1970s, government and Federal Reserve Bank policies place high priority on keeping inflation in check.

Boat financing is the best it has ever been. Many years ago boat loan rates were lower, but relatively few institutions made boat loans at all. Now, we have low rates combined with many institutions competing for the consumer's boat loan. I remember only 6 years ago you needed 30% down and an 18% interest rate to get a boat loan. Last fall, at NMMA's Norwalk, Connecticut Show we had airplanes and blimps flying over the show advertising boat loans — each day of the advertising airwar brought lower interest rates.

The number of financing options for boat buyers reached a new high in 1988, the result of surplus installment lending reserves and a continued influx of financial institutions originating marine loans. Lenders are flush with cash, and competition for boat loan customers is continuing unabated according to the National Marine Bankers Association.

With major auto makers offering subsidized loan programs which the banks can't beat, money that used to go into auto loans is now in plentiful supply and chasing boat loans like never before. At the same time, the boat buyer has been discovered as a preferred prospect for lenders.

The Tax Reform Act of 1986, effective for the first time in the 1987 tax year, is expected to net out to a slight benefit for those who own boats in almost all cases. The rules of the tax deductions game have changed, but the net effect will be minimal to slightly beneficial as a result of lower tax rates.

It should also be noted that there is phase-out period of consumer interest expense deductibility and the phase-in of lowered individual tax rates, with 65% deductibility for installment loan interest by 1991. However, just two tax rates of 15% and 28% (plus a 5% surcharge for high-bracket taxpayers) remained in 1988, compensating for the phase-out of installment loan deductibility.

The new tax cut probably added about 2% to 3% to the disposable income of families with incomes under $50,000. This group accounts for about 80% of our customers.

On the subject of disposable income, let me just briefly note that our consumer's disposable income has been growing in the last 5 years — unlike the high inflation years of the late-70s and early-80s. Disposable income means after taxes. Discretionary income means after taxes and af-

ter necessities like food, clothing and shelter. When both are growing — as they are now — we're bound to have a good year. Better yet, expenditure on boating products has been growing at a faster rate than either disposable or discretionary income growth in the last 5 years. This simply means that people are spending more of their discretionary and disposable income on boating than they used to.

So, the historic economic trends fundamental to our success are all good news.

But perhaps the single most significant factor supporting our sales in the future will be the large number of "baby boomers" — some 80 million of them — just coming into the prime boat buying ages. If the historical ratio of boat owners to general population holds true, the baby boomers by themselves are going to buy 4 to 5 million boats in the years ahead, compared with an industry which sold about 6 million units in total in all of the decade of the 1970s. With boat buying by other age groups taken into account, the industry should easily surpass the sales totals of the 1970s during the next few years as we move into the early- 1990s.

Not only are the baby boomers a much larger group than ever before in terms of our prime boat buying age segment — the 35 to 55 age group — the demographics within this group make them more likely to buy boats. They are more outdoor activity oriented than previous generations in this age group. They are typically better-educated and hold better jobs — meaning more discretionary income — than their predecessors. They will provide us with a fundamental groundswell of sales activity unlike any we have ever enjoyed before.

With the baby boom providing us with more first-time purchasers, the group of boat owners grows. As the group of boat owners grows, the number of second and third time trade-up purchasers also grows. The number of non-boat-owning friends who are taken for a boat ride and become interested in the sport — the main route of first-time purchaser interest — also increases. I like to summarize these two factors with the phrase: "The more boat owners there are, the more there will be." Every new person we bring into the sport becomes like an annuity for us because of the high likelihood of trade-up purchases and his bringing still newer people into boating.

So the consumer demographics and population trends will be very strong for us for the next 15 years — more good news.

According to boating industry statistics, 69.7 million Americans participated in recreational boating last year. There were 14.8 million recreational watercraft of all kinds in use on our nation's waterways. How they were able to access the water and where they docked, anchored, or stored their boat is a challenging question, considering industry estimates

that there are only 8,481 marinas and boat yards, yacht clubs, dockominiums, and parks with mooring facilities in the United States. Preliminary research by the States Organization for Public Access (SOBA) has turned up only 12,000 to 13,000 public boat launching ramps throughout the country. A recently concluded study by the National Marine Manufacturers Association counts 381,562 slips, 32,884 moorings, and 146,502 dry-land berths in existence.

Clearly we have a boating facilities shortage in many parts of the country. It is a fair assumption that many more Americans might participate in boating, and those already participating would enjoy it more if there were more if there were more and better facilities for access to boating waters.

If recreational boating is such a dynamic growth national pasttime, why hasn't the private sector rushed in to capitalize on the demand for more boating facilities? There are a myriad of temporizing economic reasons linked to seasonal limitations on boating activity, zoning restrictions, environmental protection limitations, etc. When you look at the makeup of the boating population, one significant factor becomes quickly apparent. Boating is not a rich man's sport. By far the majority of boats in use are small trailerable vessels 16 feet or less in length. Their facilities needs for the most part are simple launching ramps with related space for parking the towing vehicle and trailer. There is not a big profit margin in such facilities. Often the facilities are needed in or close to metropolitan areas where the majority of the boat owners live, and the price of land and land development there is too dear.

In the absence of private capital investment incentives, we have no recourse but to look to government to help fill the facilities gap. We are not looking for handouts, however.

In 1984, in order to raise much needed revenues to provide Federal financial assistance to state boating and sport fishing enhancement programs, Congress created the National Aquatic Resources Trust Fund Act, more popularly known as the Wallop-Breaux Act. This legislation, just reauthorized through 1993, captures total revenues collected from federal tax on fuel used in boats for boating safety and facilities development. Treasury estimates that as being 1.08% of total motor fuel tax receipts or approximately $90 million a year. Of this, $60 million in each of fiscal years 1989 and 1990, and $70 million in each of fiscal years 1991, 1992, and 1993, is credited to a Boat Safety Account in the dedicated trust fund, to be divided 50/50 between the states and the Coast Guard for recreational boating services.

States have the option of using part of their allocations for acquisition, construction, or repair of public access. All the residuals in federal

motorboat fuel tax money, i.e., anything over and above the first $60 to $70 million, plus a token $1 million reserved to the Land and Water Conservation Fund, are deposited to a second account in the dedicated trust fund called the Sport Fish Restoration Account.

Under the Sport Fish Restoration Account, there is some guarantee of money from boating being spent on boat ramps and related facilities. The Wallop-Breaux Act stipulates that states sharing in the Sport Fish Restoration Account are obligated to spend at least 10 percent of their allocation on boating access to fishing waters. Realizing that it is tax on fuel used to propel motor powered boats that generates the revenue, besides customs duties on pleasure boats and yachts and excise tax on sport fishing equipment, Congress has mandated that all such federally assisted projects shall be open to motorboats with the highest horsepower consistent with the size of the water body being accessed.

We are very pleased and gratified by the splendid cooperation we have been receiving from the U.S. Fish and Wildlife Service and the Coast Guard as joint fund administrators. We are witnessing boating facilities development by way of grants in aid and plans for inventorying existing boating facilities nationwide to pinpoint where the shortages are. In the Wallop-Breaux reauthorization legislation Congress has directed the Secretaries of Interior and Transportation to conduct a joint nationwide study of marine fuel consumption to ensure that the dedicated trust fund receives all the federally collected motorboat fuel tax revenue to which it is entitled. I am pleased to report that the existence of the federal fund has generated renewed interest by the states in earmarking state tax on motor fuel used in boats as a way of matching federal financial assistance for boating facilities development.

In conclusion, in the United States today, the future of boating is bright measured in terms of popular appeal or enthusiasm for the sport. We are working hard to make it even brighter by providing self-supporting ways to finance boating facilities to keep up with the growing number of boaters.

Boating and Congress

*Sherry Steele**

It is an unexpected pleasure to attend my first Pacific Coast Congress of Harbor Masters and Port Managers Conference. I am sorry that your scheduled speaker, Duncan Smith, the Chief Minority Counsel for the Merchant Marine and Fisheries Committee, was unable to come. The House and the Senate are in the midst of negotiations on the Omnibus Drug Bill and central to the issues we are most concerned with in our area is the "innocent owner" defense for innocent owners of vessels seized for personal use quantities of illegal drugs.

You all know how confusing the legislative process can become, so I will concentrate on simplifying what has occurred this year. Reduced to the lowest common denominator, there have been three bills which directly affect the boating industry, and one, because it does not mention any segment of boating. Although this is a relatively small number of bills for us to have considered and passed, I think we can feel good about the final results of our efforts this year.

Everyone here was happy to see that there were no references to the boating industry in H.R. 4333, the Tax Corrections Bill. Your efforts last year to prevent the repeal of the tax deductions on recreational boats as second homes were so effective that the Committee on Ways and Means was not about to touch the topic again this year. You can count that success two years in a row.

For the first time in two years, an authorization bill for the Coast Guard was successfully passed. At times there were considerable doubts that it would ever take place, but on September 8, H.R. 2342, the Coast Guard Authorization Act of 1988 was signed by the President. The funding level authorized, and since then appropriated, for the Coast Guard for FY '89 is very close to the level of the President's request for them. Consequently, for the coming year we can devote our energy to solving the various problems that confront the boating community rather than wildly crusading for additional funds to keep the Coast Guard running.

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* Minority Staff, U. S. House of Representatives, Committee on Merchant Marine and Fisheries

The Coast Guard will once again be out there on the water and in the air with enough fuel to perform their jobs. I would like to convey the thanks of my boss, Bob Davis (R-MI), and the Coast Guard Coalition for the united effort put forth by all of you to make sure this happened. It was not a minor victory at this time of reduced budgets.

A major portion of the Conference Report on H.R. 2342 was the reauthorization of the Wallop-Breaux Trust Fund. Every aspect of this reauthorization affects your industry, but the Boat Safety Account is particularly important to you. As the result of hearings earlier this year on this issue, it was learned that there were significantly more dollars than expected accruing to the Trust Fund and it was agreed that more should be dedicated to the Boat Safety Account. The funds authorized to be appropriated in the Boat Safety Account for FY '89 and '90 will be increased to $60 million, to be evenly divided between the Coast Guard and the states, and in FY '91 it will be increased to $70 million, once again evenly split. The report language on this section also stipulates that there are to be no restrictions placed by the Coast Guard on the selection and construction of state boat access sites. This program as it has evolved has truly become one of the most beneficial user taxes ever created.

Another extremely heated issue that we believe has been settled with a provision in the Authorization Act, is the towing assistance issue. Out of the conference between the House and the Senate came a provision directing the Coast Guard to utilize all qualified resources to render nonemergency assistance to boaters in trouble. In nonemergency cases, the regular Coast Guard will continue to operate in a manner that minimizes competition with private towing, but the Coast Guard Auxiliary will once again be able to assist boaters. The report language specifically states that this provision does not change the towing policy as it is currently implemented by the Coast Guard.

The second piece of legislation, H.R. 3105, the Codification of the Ship Mortgage Act, actually has taken on two guises this session. It was originally included in the Omnibus Drug Initiative Act of 1988, which is currently in conference between the two Houses, and has simultaneously been passed by the House of Representatives as a freestanding bill and is momentarily awaiting passage by the Senate. You can see we are quite serious about having this particular piece enacted this year. The time is right and we do not want to miss the opportunity while the support for passage is out there. As a part of the drug bill, the emphasis was on the provision creating a new vessel owner identification system. You are well aware of the thousands of vessels that are stolen annually in this country, and law enforcement officials have no way to identify the true owners of those vessels or to effectively track their interstate movements. Lest you

fear the Coast Guard will be overwhelmed by yet another task, this program can effectively be combined with the documentation system already in existence, and the Secretary may require that the entire system be contracted out to private industry. In fact, that is our preference. The system will be for all vessels of the United States and the information is to be coordinated on the state level, with all state participation strictly voluntary. The incentive for state participation is derived from the "preferred status" available to all vessels included in the system and the benefits this provides the banking institutions. There is also contained a repeal of the prohibition against user fees for documentation.

The bill that is holding everyone in Congress hostage at this moment is the Omnibus Drug Initiative Act of 1988. The negotiations have been fast and furious and the issue that has consumed the energies of many of the staff on the Merchant Marine and Fisheries Committee, has been to insure that there was a defense for innocent owners whose vessels have been seized. The House-passed Omnibus Drug Bill, H.R. 5210, provides a defense in forfeiture proceedings for owners of conveyances who can establish that they didn't know of, or consent to, a drug violation for which their conveyance was seized. The bill also provides an expedited forfeiture procedure for innocent owners which requires a final determination to be made in 20 days on whether the conveyance will be forfeited or released. This language ensures that innocent law-abiding citizens will be able to get their vessels back in a timely manner.

The negotiations on this issue are taking place right now and the final vote is expected to take place on Friday. The House-passed version of the Drug Bill contains this provision, crafted by the Justice Department, and it has been a hard-won compromise. On the Senate side, the story is not quite so good, but the final amendments have not yet been offered. If our efforts succeed, Senator Ted Stevens of Alaska will be offering an amendment that will bring the Senate version in line with the House. If not, his amendment will primarily protect commercial fishermen and not the individual boater. We will keep you informed.

Boating and the Washington State Legislature

*John E. Woodring**

The recreational boating industry has made great strides in the last ten years in establishing a recognizable presence and direction with the Washington State Legislature and state agencies. Beginning in 1980, the industry, through the Northwest Marine Trade Association, joined with marinas, the ports, and timber companies to control escalating lease rates for state aquatic lands. After successfully lobbying two moratoriums on any lease rate increases, the marine industry participated in a negotiated law with the Washington Department of Natural Resources in setting predictable and fair leases that are based upon 30% of adjacent upland values. The new law has been working well.

The 1980s saw the imposition of a 1/2% excise tax on recreational vessels. The recreational boating interests have made two unsuccessful attempts in the Legislature to roll-back or repeal the tax. The Legislature appears entrenched on this tax, and boating interests are forever watchful to ensure the tax is not increased.

In 1985 and 1986 two significant laws were implemented affecting the recreational boating industry. First a vessel titling and registration act was passed, which now provides valid titles for recreational vessels along with provisions to prevent abuses in vessel sales and title transfers.

Secondly, vessel dealers are now required to be registered and must meet certain requirements such as a place of business, accurate bookkeeping, and bonding standards. The law imposes penalties for persons selling recreational vessels without a registration or persons who are not legitimate dealers but merely acquire a registration to circumvent payment of the vessel excise tax, since dealers are exempt.

The boating industry has been making a concerted effort in the last five years to convey to state elected officials the economic contributions of recreational boating in Washington. To this end, economic data have been

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prepared and presented by the Northwest Marine Trade Association to legislators. Our message is being heard.

In the future the industry will be pursuing legislative and administrative changes to enhance our ability to do business. For example, in 1989, there will be legislation proposed to give boat dealers the same interest rates for flooring and sales as the automobile industry. With the strong support that has developed in Washington State government and the ever-increasing legitimacy of the business through actions such as titling and registration requirements, the time is opportune to pursue changes that will help recreational boating grow.

Servicing the Boater in the '90s

Trends in Boats and Boating

*George E. Sullivan**

It was our observation that the marine industry was out of step with the buying public that set us on a new course in 1981. We saw the aging of a population which should have brought with it dramatic increases in boat ownership, but it wasn't happening. We saw the results of research that indicated boats were perceived to be enormously more expensive than they really were. We saw a slowness in the purchase process by interested consumers that was directly related to the number of choices and decisions the boat buyer faced. In an ever-more complex world, we felt people were seeking simplicity. We needed to make it easy. We changed our entire approach to our business at that time...and we've never looked back with regret.

Our company, in case you're not familiar with it, is the largest builder of pleasure boats in the world. We started building two models of runabouts in the late 60s. By 1972, our total sales from manufacturing were approaching $5 million a year. That built to approximately $50 million a year in 1981. At that time...our decision point for change...we were building fewer than 4000 boats a year. Today, just seven years later, 4000 boats is only slightly more than two weeks production.

Our company, which many of you may know as Bayliner, actually builds six brands of boats from 14 to 45 feet in length. We operate 26 factories from Washington to Florida and have four more under construction right now. We do business in every state in America and more than 40 foreign countries as well.

I think we've done a reasonably good job in recent years figuring out where the American public are headed and what they want. But you want to know where they're headed next. I hope I can at least give you some trends to look for that we believe will shape the future of boating.

Let me give you the conclusion first. Over the next decade, boating should grow at a rate that is greater than at any time in the past.

Sales of boats and boating products doubled in the five years from 1982 to 1987, increasing from $8.1 to $16.5 billion dollars a year. That's

* Vice President, Marketing and Communications, US Marine Corporation

an increase of nearly $1.7 billion a year in a period of relatively low inflation. Assuming the same conditions in the future, expect sales to expand at a rate at least 50% faster throughout the year 2000. Now, let's examine why.

Boats are a discretionary purchase. Few people need a boat, so the desire to purchase must be strong and five conditions must be satisfied if sales are to expand as projected.

There must be a stable energy outlook, available credit, a stable economy, an "attitude" that the future will be OK, and a large group of potential customers.

Energy

Unless you're a sailor, fuel is essential to the survival and growth of boating. Since sailboats at the present time constitute perhaps only five percent of the new boat sales above 14 feet or so, fuel availability is a critical issue. Fortunately fuel is readily available — in glut quantities — and prices are at bargain levels.

Furthermore, the outlook is stable. There does not appear to be an energy crisis looming in the foreseeable future. This is a far cry from the late 70s when our nation was reeling from the effects of a petrochemical shortage and the Energy Department was proposing a ban on weekend boating as an energy conservation measure.

What we learned from that period was that the price of fuel was not a major sticking point with boat owners...availability was the key. So even if fuel prices escalate in the future, it should not appreciably slow down boat sales.

Credit

America is a credit society. People make their purchases based on the monthly payment, not on the total purchase price. So the availability of credit at reasonable rates can accelerate or stall the rate at which boats are selling.

In the last recessionary period, interest rates shot up to 21% and in many areas there was no money to be loaned for boats. Boats were most often lumped with cars in a bank's portfolio, so there was no clear identification of the boat buyer in terms of his credit-worthiness.

Thanks to the efforts of the National Marine Bankers Association, there has been an awareness developed among lending institutions that the boat buyer is a cut above the auto purchaser. In fact, the default rate on the repayment of boat loans is only 0.14%, while the default rate on automobile purchases is 0.86%...six times as high.

Today banks, credit unions, brokerage houses, and even financial giants like General Motors Acceptance Corp. are all aggressively pursuing boat loans.

Economy

A stable or growing economy is another necessary ingredient in expanding boat sales. Since most purchases are financed, people who are uncertain about their job future...or without jobs...are unlikely to take on a hefty monthly payment for a purely discretionary item.

Today we are in the sixth year of an expanding economy. More people are employed than at any time in the past. And while there is a Presidential election just around the corner, no one is predicting a sudden change in the economy regardless of which party prevails.

Attitude

Even with fuel, credit, and the economic issues on the positive side, attitude can affect our business. It is the single most important element. A boat, whether small or large, is usually a large purchase to the customer. There is a comfort zone that most seek before taking on another obligation. We see it long before the government indicators report it...their measurements are a history book.

Since April of this year, boat sales have been off their torrid pace of the past five or six years. Inventories are building and production rates are being pared back. This does not indicate to us that we're approaching a recession, but that the public is taking a more cautious path largely because of the uncertainties of the future with a new president and administration.

I hasten to note that we are not seeing a fallback in sales from previous years, but a slowdown in the rate of growth. We will probably have to settle for a $140 million gain this year in our business as opposed to a $200 million gain.

Potential Customers

Now we get to the issue that is driving all the sales...the body of potential customers for a boat. There are so many people coming into the boat buying age that it is mindboggling. These people will fill all the moorages that can be built, crowd all the launch ramps that can be opened, and stress the enforcement and aid capabilities of local officials as well as an already stretched Coast Guard.

Let me explain. Bayliner is a pretty good builder of boats that can get people started in boating. We build total boat, motor and trailer packages

for under $5000. These can be purchased for a thousand dollars down and payments under $100 a month. So we're not targeted at a high income, older audience. Yet we find that the buyers of even our modestly priced outboard family runabouts have a lot going for them. Their average age is 40, they're married and have children (88%), 75% have gone to college, and they have a healthy household income (approx. $60,000).

Looking at the upper end of our line, the 32-through 45-foot inboard cruisers, all the demographic numbers go up; average age 49, income above $150,000.

Bayliner is not unique in having such well-qualified buyers. The latest statistics on average boat loan customers from the National Marine Bankers Association show the average age of 40, average income of $67,500, and working spouses in 63% of the homes.

The pig-in-the-python, that great population bulge known as the baby boomers, is swelling the number of people who fit the demographic profile of the boat buyer. The oldest of the boomers is now 42 — and the number who cross the line past 35 will exceed 4 million this year and every year through the year 2000. That's an increase of 60% over those reaching this age in the past decade.

Not only are there more people in the age category of boat buyers, but they're better educated and earn far more for their age than any previous generation. Projections based on constant 1984 dollars are that over the next 12 years the number of households with incomes between $50,000 and $75,000 will grown by 50% and households over $75,000 will almost triple.

The market potential, if you're in my business, is clearly outstanding. The size and strength of the potential market has brought bigger, more sophisticated companies into the business. In the past, boat builders could be typified as small, undercapitalized and privately held. All together there were about 3000 separate companies. Today there's a consolidation as bigger, publicly held companies recognize the potential.

Brunswick started the ball rolling by buying our company in December of 1986. Then Sea Ray, the second largest builder of boats. Then four other boat building companies. Brunswick already owned Mercury Marine, the largest producer of marine propulsion, and Zebco, the largest producer of fishing reels.

OMC joined in, buying seven boat companies, and Irwin Jacobs, six. The Thompsons, principal stockholders of the Southland Corporation/7-11, bought three. Coleman has four.

The major powers are aligning. They'll bring bigger budgets, more sophisticated marketing, and stronger advertising into a national push to make boating America's most popular pastime.

In boats, I expect the future to be heavily weighted to trailerable runabouts and small cruisers at the entry level. Three quarters of the boats we've built in the past seven years have been 19 feet and under. But as people move up...get 4-foot-itis...there will be great need for in-water and dry-land storage facilities. The average time a person has a boat before moving up is 42 months, according to the NMBA.

At the other end of the spectrum is an emerging group of super-rich who are opting for larger, more expensive boats. For the past couple of years we've had boats on our drawing boards of 70 feet and larger. Other companies that are strong production builders are actually ahead of us in this area. What was once the purview of the custom builder only is now the hot growth area for assembly line builders.

In closing, I will go back to my early-announced conclusion...boating in the next decade will grow at a rate faster than anything you've experienced so far. It will come in all size ranges, with the heaviest number of boats in the trailerable sizes and perhaps the largest percent of growth in the luxury, or mega yacht, category. As I speak right now, two major publishing houses are preparing new boating magazines to debut...large circulation, newsstand-only to reach the growing market. The major corporations I spoke of earlier are launching assaults to make certain every prospect at least considers a boat...one is preparing national television ads and working on a syndicated weekly show on the fun of boating...another is launching boat-iques in major shopping malls through the Midwest.

Like it or not, growth is coming. The challenge, as always, is to manage it.

Innovations in Marina Design

*William Elmer, P.E.**

Background

Innovation is defined as "Beginning or introducing something new or being creative." It is the creative aspect as it applies to marina design which is the topic of this presentation. The marina designer must be more creative and innovative than he has been in the past. It is the purpose of this presentation to discuss why the designer is becoming more innovative and to present several examples of innovative design.

Innovative design might at first be thought of as the "nuts and bolts" of the marina; how the docks are designed, the use of floats, the introduction of built-in utilities in floating style docks, better power centers, dock boxes, entry gates, cable TV and the like. In this area the manufacturers tend to be responsible for convincing the designer of the usefulness of these features. Nevertheless, these type of design features are more evolutionary than innovative, and truly innovative designs are brought about by other factors which have little to do with the hardware used in a facility.

Issues Affecting Design

In order to approach the topic of innovation in marina design, it is first necessary to understand the issues which affect the planning and eventual design of a new facility. These are:

- Few or no "natural" sites are available for development
- Large projects tend to generate lots of public interest
- The environmental regulations are strong and well enforced
- The waterfront is in demand and as such public access is tied to development

To usher a project through the permit and review process, the owner or developer, and therefore the designer, must work within the require-

* Senior Engineer, Reid Middleton and Associates, Inc., Lynwood, WA

ments of the Shoreline Management Program, zoning regulations, and environmental regulations to obtain the permits for a project. What then occurs is that the design becomes a part of the regulatory process. I have defined this as:

"The process of obtaining at least partial acceptance of the project by the people or groups who will either be impacted by the project or who have regulatory responsibility and thus control the permits for the project."

These groups will include as a minimum:

- The surrounding property owners and neighbors.
- The local town or county with zoning and shoreline permit authority.
- State regulatory agencies. (In Washington these are Ecology, Fisheries, and Natural Resources)
- Federal regulatory agencies such as EPA, the Corps of Engineers, and Fish and Wildlife.
- The Indian Tribes.

Other public interest groups such as Friends of the Earth, Greenpeace, and the Sierra Club may also become involved with a project and if they are not recognized and have their needs met, will resort to filing suit against a project if necessary to have their concerns addressed.

Public Access

In addition to the specific requirements placed on a project by the special interests I've noted earlier, there is one other issue which has become a major factor in all types of waterfront development and which has become an obstacle to some commercial waterfront development. That issue is public access.

The local jurisdictions, under pressure from public interest groups, have placed public access requirements into the Shoreline Master Programs. These requirements force the owner, either private or public, to provide access to private property as a condition of the permit. While many marina projects would probably have made such provisions, other more commercial projects may find they are required to provide innovative solutions to access at the site, may have to look elsewhere, or may have to fund an alternate mitigation site. These amenities take many forms and may include bike baths, shoreline walks, overlooks, and view corridors.

Public access has become a "hot" issue. It has been rumored that some within the regulatory community have stated that the local jurisdictions should "extract anything and everything" they can from developers

in the way of public access, and that the permit process should be used to hold up a project until they are "ready to sue."

Therefore, in addition to meeting all the basic environmental concerns such as fish passage, protection of habitat, and recognizing and mitigating for treaty fishing rights issues, it is necessary to provide improved public access.

The following presents and discusses several innovative marina designs which address these issues.

Innovation in Design

All the projects discussed here are going or have gone through an evolutionary process of "give-and-take" with the involvement of many groups. It is during this process that the innovative design will be developed, not once the permits are in hand and the "final" design gets underway. Any hard line by either party, but most especially by the owner or developer, may result in the project's ultimate demise. In general, the regulatory agencies are fair and willing to work with you. It is always possible to come up against strong opposition to a project from any number of sources. However, an even more daunting fact is that the process is long and expensive. As I'm sure many people are aware, the Elliott Bay Marina is an example of just how long and expensive the process can be.

EXAMPLES OF EXISTING FACILITIES

JOHN WAYNE MARINA

The issues facing this development by the Port of Port Angeles were primarily water quality, existing habitat, and public awareness. The development was proposed for a relatively undeveloped shoreline in Sequim Bay with no natural protection, requiring a breakwater and dredged basin. The site had prior commercial activity, but had seen little use for a number of years. The shoreline was originally owned and given to the Port by John Wayne (The Duke) with the stipulation that a marina be constructed on the site.

The solutions which were developed included:

- Relocation and enhancement of a salmon spawning stream away from the marina entrance.
- A circular layout to enhance tidal circulation and prevent areas of low water quality.
- A wide entry to improve circulation, with a floating breakwater for wave protection at the entry.
- A size reduction during the development to reflect public attitudes.

- Special signage to inform the public of critical wetland habitat in the area.

At present the Port is continuing to assess if public access improvements can be made to improve fishing opportunities on the breakwater.

POINT ROBERTS MARINA

The issues addressed were basically the same as with the John Wayne Marina. In particular, this facility was envisioned and subsequently developed, except for the entrance, entirely upland as a means of minimizing environmental and shoreline impacts. Specific to the design of this 900-slip facility were:

- A circular basin and the use of physical model studies to optimize the layout for improved water quality.
- An entrance design and long-term agreement to provide for periodic beach material bypassing.

PORT OF EVERETT MARINA

While the Port of Everett Marina is a bit older than most of those presented herein, it is interesting to note that the basin entrance is exposed to both wind waves and considerable boat wake on the Snohomish River. Certainly, given the regulatory climate when this facility was built, the designer could have considered the use of a vertical wall or even a rubble-mound structure. However, a floating breakwater was used, and by using the floating structures, circulation within the marina has been enhanced.

In addition to the breakwaters, the development of the south marina was one of the first in the area to specifically dedicate a large portion of the shoreline adjacent to the marina to public access and amenities. The result is that the moorage tenant takes a "back seat" to the public and is required to park relatively far from his dock. This method is recommended for all new facilities, as views and waterfront esplanades are far more valuable and will return far more to the owner than if used for parking.

FRIDAY HARBOR

This is another relatively older project which has placed a high priority on public access. The entire floating breakwater surrounding the marina is available for access to both the boater and the stroller, and there are no gates or restrictions to the public onto the docks.

CAP SANTE MARINA

This facility was the expansion of an existing marina. Interestingly, the innovations associated with this project were developed well before the marina. In this case, the Port, working with the City, determined that the entire marina and Port owned property in the marina area should be looked at and that a Master Plan for the area, with emphasis on public access was in order. The new marina facility was constructed with a shoreline esplanade, ties to the City downtown core, and plans for new commercial activities to be built adjacent to the marina. Public access was the major innovative factor in this facility plan.

EMBARCADERO - NEWPORT, OREGON

This example recognizes a facility in Oregon where a marina for both pleasure and commercial vessel was developed with a strong early commitment to public access. Access along the shoreline is provided, docks are relatively freely accessed, and the visitor has the opportunity to experience first hand the waterfront. Protection to the marina is afforded in part by a floating breakwater, one of the first of its kind on the West Coast. Public access for fishing from the breakwater was provided. Interestingly, this facility was installed in the late 1970s and shows that developers and designers were aware of the positive influence of enhancing public access even then.

EXAMPLES OF PROJECTS UNDER CONSTRUCTION

CARILLON POINT MARINA

This is a facility presently under construction in Kirkland Washington, on Lake Washington. The marina is a part of an overall 100 million dollar development project by the Skinner Development Corporation. The site was an old shipyard during World War II, which had deteriorated over the years. The uplands were used for a number of years as the training facility for the Seattle Seahawks. The waterfront was virtually unused. A case history of the project is presented in the following section.

The specific issues which arose over the course of the project planning were:

- Because of the wave climate, the marina would require a breakwater.
- The marina breakwater design would need to accommodate fish passage and maintain water quality.
- Public access along the entire waterfront and over the water for fishing was a condition of the permit.

The solutions which were developed included:

- The breakwater was designed as a vertical wall for wave protection. However, the wall ended approximately 12 feet below the water to allow adequate circulation. To attenuate reflected waves, the wall used precast concrete panels with horizontal relief.
- Near shore in shallow water, the wall reaches to the bottom; however, the breakwater was configured to provide a fish passage area along the shoreline by orienting a portion of the wall parallel to the shoreline approximately 75 feet off shore.
- Along the shoreline and over the water, a public esplanade and overwater boardwalk were provided for access from one end of the property to the other.
- The north breakwater was integrally designed as a pier to be used for public access, fishing, and guest moorage.

The developer has created an unequalled ambience through the orientation of all the buildings and marine structures, which invites public access. Everyone is encouraged to see what I feel represents the state of the art in innovative project planning and design.

EXAMPLES OF PROJECTS IN FINAL PLANNING AND PERMITTING STAGE

ELLIOTT BAY MARINA[1]

While this project has a Corps permit, it is unfortunately being held up by a suit instigated by the local Indian tribe. Nevertheless, the project developer has worked long and hard to provide several innovative solutions in the design. The basic issues to address were the need to provide wave protection, fish passage, enhanced fishing opportunities, and habitat preservation.

The solutions developed were:

- Offshore rubblemound breakwater was tied shoreward with timber walls and openings for fish passage and water circulation.
- For public access, a special "bridge" to provide access to the breakwater is one of the most interesting features. On the breakwater, facilities were provided for public fishing.

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[1] The author thanks David Abercrombie, Elliott Bay Marina Group, for allowing him the use of this project as an example.

SHIP HARBOR MARINA[2]

As has been noted, the naturally protected sites are rare and at or near capacity. Thus, marina projects must be sited in locations where breakwater protection is necessary, but rubblemound structures may not be permitable, necessary, or cost-effective. The Carillon Point project is an example of this factor, where fish passage, water circulation, and water depths conspired to require the wave protection structure be a vertical panel with a gap below.

The ship harbor project was faced with several new issues. One was that the marina could not disrupt an existing nearshore inter- and sub-tidal habitat. This meant that no disruption could occur between elevation minus eight and plus eight feet, mean lower low water datum. Consequently, keeping the marina near shore and dredging the typical 10 to 15 feet were not options.

Thus the designer proposed to move the entire facility outside or offshore of the minus eight foot contour. This, however, placed the outer edge of the facility in water too deep to permit the economical construction of a rubblemound breakwater. Since the wave climate was moderate, again innovative thinking resulted in the planned use of the surplus Lake Washington Floating Bridge pontoons from the Interstate 90 project to provide wave protection.

The use of the pontoons further permits enhancing public access to the water as the width of the pontoons will allow limited vehicular access, and thus tour boats and passenger ferry use will be encouraged. In addition, the pontoons will be used for fuel storage and a fuel dock.

At this time the project has a permit for the marina and the owners are putting together the financial package. We at Reid Middleton are looking forward to preparing the final design for the fixed marine structures, including the approach docks and vertical wall breakwaters.

EXAMPLES OF PROJECTS AT THE CONCEPTUAL LEVEL

PORT OF EDMONDS

The Port of Edmonds has retained Reid Middleton to evaluate the alternatives available and identify possible sites within the Port District for moorage expansion. The study eventually determined that the most likely location for a facility suitable for substantial expansion (up to 1000 slips) was immediately north of and adjacent to the Chevron Oil Company property at Point Wells.

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[2] The author thanks Jeff Layton, P.E. of Layton and Sell, Inc., for allowing him the use of this project as an example.

In the conceptual layout, the same basic habitat concerns that were developed at Ship Harbor surfaced, namely that no disruption of the inter and sub-tidal area between minus eight and plus eight feet mean lower low water datum would be permitted. This location is on open Puget Sound and as such exposed to high wave activity, necessitating the use of a rubblemound structure for wave protection.

The solutions developed for this facility include:

- Locating the entire facility seaward of the minus eight contour, thus requiring no dredging.
- Constructing a rubblemound breakwater with a curved form to avoid excessively deep water and thus high breakwater costs.
- Leaving the ends and the along-shore area open for fish passage.
- Minimizing upland development to marina-related facilities only, thus limiting traffic impacts to the surrounding communities.

At this time the Port of Edmonds is considering whether or not to proceed with the development of the facility. Issues yet to be fully addressed are: Indian treaty fishing, local community perception, traffic, and access through the adjacent Chevron Oil Company property.

The project, if the Port determines it wants to pursue it, quite obviously still has a very long way to go.

Conclusion

I hope I have enlightened and stimulated your interest in the system we work within and how the process is responsible for the designs of today's marinas. As noted, the issues of siting, public access, the environment, and local interests cannot be ignored. I feel we will continue to see innovation in the marina design field and I trust the examples which have been discussed have given you some insight into the design process and where we are headed. Hopefully the future will bring the developments of new facilities and the expansion of existing facilities.

History of the Carillon Point Development

This section presents a brief history of the planning and development of a 31-acre parcel on the shore of Lake Washington by the Skinner Development Company. The project includes a 220 slip marina.

Up to and through the Second World War, the 17-acre parcel of the overall project site between Lake Washington Boulevard and the lake was used as a shipyard. Following the war, the site was used less and less for shipbuilding, and the waterfront structures deteriorated through neglect and vandalism with the uplands used intermittently for light industrial ac-

tivities. In 1979 the owners leased a portion of the property to the Seattle Seahawks for a training facility.

In the late 1970s the owners were considering selling or leasing the property as separate parcels. In 1980 the City of Kirkland suggested to the owners that if they were to put together a complete mixed use project for the site, which by the way, is one of the last large sites available on the Lake, the City would work with the owner to modify the zoning and land use regulations to permit such a mixed use facility.

One of the features which the City said they wanted as part of the project was a "big" marina. Other features included access to the waterfront, as well as improvements to the adjacent arterial.

By 1984 the owner had put the preliminary project planning together and was well into the EIS process and on the way to obtaining the Shoreline Substantial Development Permit. The marina, originally envisioned as over 400 slips extending to the outer harbor line, was eventually reduced to approximately 220 slips located no farther lakeward than approximately half way between the inner and the outer harbor lines.

The process of arriving at the marina layout involved several groups. The primary special interest groups who were involved in shaping the final design of the marina were:

- The City of Kirkland
- The Yarrow Bay Community (The neighbors)
- The Washington State Department of Fisheries
- The Muckleshoot Indian Tribe

For the overall project and especially for the marina, the owner and engineer met with and discussed the project with these groups on a regular basis. Through the give and take process, a design was developed which met the owners' and the special interest groups' needs. The Shoreline Permit was obtained and the Corps permit application was approved within 3 months of submittal.

The specific features which were provided include the following:

- Public access was provided along the entire shoreline of the project. A special feature is an overwater boardwalk section.
- A breakwater to protect the marina is provided. The breakwater is constructed with partial height vertical precast concrete panels for wave protection and water circulation. The faces of the panels on the western breakwater have a special relief to reduce reflected waves.
- A public pier and moorage were provided, which was integral with the breakwater along the north side of the project.

- Fishery issues as regards nearshore passage for juvenile salmonids was provided by terminating the breakwater approximately 75 feet from the shore and adding a breakwater parallel to the shore to protect the marina.
- An agreement to provide fishing enhancement opportunities was negotiated between the tribe and the owner.

The project is nearing completion and will be open in early 1989 for moorage tenants.

Innovations in Marina Management

*Neil W. Ross**

Over the next decade more Americans for the first time are going to be buying boats. But where are they going to put those new boats? What's ahead for the marinas? What will be the management structure of the moorage industry? What innovative management tools will be applied and what will distinguish successful marinas from the rest of the pack in the decade ahead?

Some Facts About Marinas

HOURGLASS OF BOATING

Think of recreational boating as if it were an hourglass. On the bottom side of the hourglass are the recreational waters, including all our lakes, ponds, rivers, bays and the oceans. The top half is the dry land side where all the boat manufacturers, the retail businesses and the public are located. The grains of sand are the people who want to go boating and their boats, motors, accessories, and all gear, food, and beverage they take for a safe and enjoyable trip.

One third of the population of this nation, we are told, want to or do, in fact, go boating. Everyone going boating has to get in and out through the hourglass's narrow neck. *That neck of the hourglass is made of all the boating facilities:* marinas, boatyards, yacht clubs, dockominiums, launching ramps. As that neck expands and grows, the more people and products are going to be able to go in and out.

But, unfortunately not everywhere in the country are the number of slips and marinas growing. Some parts of the nation are "in irons." To be "in irons," what no sailboat skipper wants to have happen, means you've headed too much up into the wind and the wind caught you head on; you not only stop going forward, but you sail backwards... and that's embarrassing and, in bigger sailboats, can be dangerous. It's tough to control a sailboat when you're going backwards. *Recreational boating facilities in some areas are like a sailboat in irons...moving backwards.*

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* President and Founder, International Marina Institute, Wickford, R.I.

MAJOR ACCESS FOR THE PUBLIC

What we are talking about is access to the water.— the narrow neck of the hourglass. We interviewed 8,611 facilities in the U.S. National Recreational Boating Facilities Survey[1] (during 1986-87) and found that 87% are privately owned and operated. Thus the majority of Americans using boats kept in all types of marinas get access to the water through privately owned and operated facilities.

It is important to understand that *access for the public* is not the same as *public access*. It is easy to confuse the two thinking that they are the same. For example, several years ago I confused the public access debate in Massachusetts. When I said that all marinas should be viewed as providing public access, the state officials really got excited and accepted the concept. However, with 97% of Massachusetts' facilities privately owned, the public officials angered the marina industry when they started talking about free public access for everybody at any time in all marinas.

Most of the marinas in this nation are combination marina/boatyards. Simply from a liability perspective, the public can't have free access at all times anywhere, in a marina that's moving, repairing, and storing boats. It's dangerous. Who could afford the liability insurance? Furthermore, in an attempt to prevent accidents and thefts, even public marinas do not allow non-boating people onto the docks. Will the government pay the insurance and provide necessary security guards in all marinas? Certainly not.

True public access is found at a town launching ramp and a public fishing pier where people have access at will. Even then access may be somewhat limited by an agency charging a use or parking fee, or by limiting hours open. But most private enterprise marinas can't have true public access — it's got to be controlled for safety, security and economic reasons. And this is called *access for the public* ... a new motherhood phrase to use when describing boating facilities.

WATER-DEPENDENT USE

This is a water-dependent business...another motherhood term. Water-dependent means that the marina can't launch boats and store them in slips ten miles or 100 feet inland. Marinas must have access across the shore, and therefore they are water-dependent uses which can exist only on the waterfront. Even the dry land marina which either stores boats on racks or on trailers inland still needs a place to launch onto the water.

Some functions of the boating businesses can be done inland, such as boat sales and winter boat storage. In addition some boatyard work, such

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[1] Ross, N., et al. In press. *US National Recreational Boating Facilities Survey, 1986-87.* International Marina Institute, Wickford, RI.

as the longer-term major repairs, might be done inland miles back from the shore with the use of big hydraulic trailers. Obviously most boatyard and shipyard repairs must continue on the shore and should also be designated as water-dependent uses.

HALF NATIONAL BOATING INDUSTRY'S INCOME ENTERS AT SHORE

In 1987 the National Marine Manufacturers Association (NMMA) reported that a total of $16.5 billion was spent at retail on new and used boats, motors, accessories, etc., including launching, storage, repairs, club memberships and so forth.[2] The U.S. National survey (op. cit.) projects a 1986-87 gross annual sales of $7.8 billion through the marina facilities. If true, then about half NMMA's reported total for the entire American boating business is spent at the shore.

Innovative Marina Management Structures

MOM AND POP TRADITION

In the real world of marinas, there remains a strong majority with Mom and Pop ownership and management. This has been changing in recent years. In many instances the original Mom and Pops have retired, with second and third generations of sons and daughters continuing the business they've grown up in. Most of the originals entered the business in the late 1940s, '50s and '60s when the U.S. had the greatest growth of marina development in the world. The "old timers" are now facing retirement or ill health and are selling out.

Surprisingly the total number of Mom and Pops may not be decreasing much. Many new Mom and Pops are coming into marina ownership. These are people who've had very successful first careers and are into a midlife change. Both husband and wife are leaving Wall Street, leaving corporate headquarters. They want to buy, own, and operate marinas as a second career. They're bringing in to the marina experienced success in business at high corporate levels. They generally are very well educated people with several degrees in business and technical fields. Raising money is not a problem for them... they know how to do it, they've got friends, they can put together corporate packages, and/or they've got enough saved. Intelligent, bright, exciting people are coming in to the marina business.

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[2] National Marine Manufacturers Association. *Boating 1987, A Statistical Report on America's Top Family Sport*. 1988. Chicago, IL. 8 pages.

MARINA CHAINS ARE FORMING

Marina chains are beginning to link together different facilities. The largest owner-operator chain in the nation is Brewer's Yacht Yards, with 12 full-service marina-boatyards in three states: New York, Connecticut, and Rhode Island. Owner Jack Brewer gave a speech at the 1987 National Dockominium Conference[3] on why Brewer's Boatyards are not going docko. Brewer calculated that through providing good service and hard work, more profit would be earned per year than if the marinas were sold docko and he had to lived off the investment's return. Long haul, I agree that full-service marinas and boatyards have a profitable future.

MARINA MANAGEMENT SERVICES

The management services are provided to people who own marinas but do not want to operate them. An example is the Brandy Group in Florida. They'll come in and, for a percentage and/or a fee, operate your facility for the absentee owner.

CORPORATE INVESTMENT AND MANAGEMENT OF MARINA CHAINS

In this situation, a large corporation with megabuck investment backing moves into a region and buys marinas that can be upgraded. They may or may not own the land, but they sell stock in the expected return on their marina management system. Example, Public Storage Corporation out of California has a division called Westrec. I believe their plan is to control some 40,000 slips in the United States in the next five years. Other investment groups are also looking at marina chains as a very profitable investment star over the next decade. Expect to see a marina program like Campgrounds of America where cruising customers use marinas linked along waterways and can get a guaranteed berth.

VERTICAL INTEGRATION OF BOAT MANUFACTURERS INTO MARINAS

Boat and engine manufacturers are trying to gain a larger share of their market by acquiring other boat and trailer manufacturers. Their strategy appears to be to take more control by combining the power of manufacturers, squeezing competitors out of the retail market. I predict that they will soon be buying marinas to protect their product's access to the water.

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[3] Ross, N. and P. Dodson, editors. 1988. *Dockominium: Opportunities and Problems, Proceeding of the 1987 National Dockominium Conference*, August 25-26, 1987. International Marina Institute, Wickford, RI. 218 pages.

PUSH AND PULL OF MARINA SELL OUTS

In an increasing number of traditional boating areas, there are big Push and Pull forces actively stimulating sales of private marinas and boatyards, often resulting in marina growth going into *irons*. This phenomenon is especially apparent in the northeast and mid-Atlantic coastal states between Boston and Washington. In general, there are two major factors pushing or pulling some marina/boatyards out of business.

PUSH OUT FORCE

Governments are indirectly pushing marinas out of business in areas with "ultra conservative regulations promulgated by government agencies insecure about what marinas are or what they do." In other words, marinas are being sold in harbors where it is extremely tough and very expensive to get permits in any reasonable time (less than 2 years, if at all) to do maintenance dredging, marina modernization, slip expansion, or construction of new marinas.

Further government push to sell often comes locally where marinas are taxed at the highest and best use. On the East Coast, the Gulf Coast, increasingly around the Great Lakes, boating facility land is not being valued as a marina, nor as a water-dependent access facility, but as very high-priced waterfront condominium housing lots. No small business (and all marinas are small businesses) can stay in business providing significant service to the public while being taxed at a rate unrelated to its present use.

PULL OUT FORCE

Pulling and tugging out of business often comes from land developers who are offering marina owners multi-million dollar payments for the property (note: not for the business which is less valuable than the space it occupies). Now just think — isn't it everyone's dream to retire as a millionaire? That offer of the dream is pulling hundreds of people out of the marina business — especially those who started in the '50s and '60s.

"Where have all the boatyards gone?" can be asked in several states. *"If you can get me a slip, I'll buy my new 40' boat from you,"* is increasingly being heard in boat shows and boat dealer showrooms. In my state in Rhode Island, for example, where I know most of the marina owners are Mom and Pops aged in their '60s to '70s, I'm predicting that 50-70% of all the marinas will be sold in the next decade. With 98% of the boating facilities in that coastal state privately owned, such sell-outs will certainly see marina conversions out of water-dependent use into residential housing, change marina management structures, increase cost of keeping a boat in surviving marinas, curtail boatyard repairs, reduce the number of slips

and constrict access for the public. Not a great prospect, UNLESS the regulatory climate changes to encourage and protect marina uses.

DOCKOMINIUM CONVERSIONS

The dockominium movement, in my view, is a response by the marina industry to capture similar profits that they see land developers reaping out of marina conversions to condo housing. However, the marina owners want their life's work to remain in the marina business. Marinas are converted into dockominiums (stackominium = dry racks) by either selling, long-term leasing (up to 99 years), or going into a cooperative arrangement among the boat owners. About 40-60% are sold to non-boat owning investors who lease out their slips on a monthly or seasonal basis. Ownership control transfers to the slip owners while marina management is usually contracted out to a management company (often starting with the original marina owner). The marina industry is responding to the law of supply and demand. But not all is rosy; once dockominium sales begin, all the slips, sold and unsold, can be revalued upwards by tax assessors to the $2,000 docko price! Some conversions have failed and bankruptcies have been reported.

Innovative Marina Management Tools

MARINAS ARE GOING COMPUTER

Increasingly more marinas are computerizing all their operations: ships store, dockage, billing, slip contracts, boat files, payroll, inventory, etc. Computers can speed the analysis of the marina business and help speed customer payments. One computer company estimates that the typical marina owner only uses about 25% of the computer's capabilities to produce information for more profitable marina management. What is needed is for management to become a computer "power user" (new buzz word meaning you really know how to make the computer work). Marinas also need, incidentally, a national standard chart of accounts.

Even existing Mom and Pops are becoming more sophisticated and are rapidly converting to computer management systems. With more business trend information available immediately, they are making management and pricing changes earlier and more profitably.

BE ENVIRONMENTALLY AGGRESSIVE

Any marina owner/manager who wants to be innovative should become environmentally aggressive, working to protect and to clean up the waterways. There's nothing better for recreational boating than clean water and a clean environment. In my opinion, any marina not leading the charge for a clean environment is going to be on the defensive very soon.

Here are four steps on what each marina can and should do:

1. CLEAN UP ITS OWN ACT

Provide adequate rest-room facilities and frequent rubbish removal. Here's a simple management rule of thumb for rubbish barrels: *Empty them before they need to be emptied.* Sounds crazy doesn't it, but how many times do you see them overflowing? That's not a clean environment. It doesn't set the right example. Litter and restrooms are very important, but don't ignore creating a well-maintained landscape, controlling rain runoff, and trying to create a good habitat in each marina.

2. EDUCATE THE BOATERS

All customers should know not to throw trash overboard but to bring back all they take out with them. Maintain and use properly the boat's marine sanitation device. Be careful when cleaning bilge with oil spills, and so forth. Special recognition should go to the state of Washington for its excellent brochure on what boaters can do to clean the environment.

3. JOIN ENVIRONMENTAL GROUPS

Whether called Save Our Bay, Audubon Society, Sierra Club, Citizens For Cleaner Water, etc., they've got good information and programs which can help boating. Join them and learn what can be done. But just as important, you as a member can educate them on what boaters do, what boaters want, and what marinas are. Fly the flag of environmentalism... and boating and marinas will prosper. When marinas are environmentally with it, "Save Our —" will find it hard to label marinas *"the enemy."*

4. GO AFTER THE REAL POLLUTERS

Point the finger at and go after those sources of major contamination of the nation's waters. Insist on cleanup, and continue to keep the marina environmentally aggressive.

UPGRADE MARINA PHYSICAL AND MANAGEMENT SERVICES

Consider an independent marina survey of your facility. Oregon State University's Dr. Fred Smith is doing this with ports and harbors in his state. A team of specialists — outsiders who have nothing to do with the harbor — analyze the business and give a report of what can be done to improve it. Why not do the same thing in private marinas or public marinas? Bring in a group of peers from outside the area to take a look and make some recommendations. But be willing to accept some criticism and some change. Don't think of it as criticism, but as a challenge to improve.

FORM CUSTOMER ADVISORY COMMITTEES

There are a number of marinas that have customer advisory committees. This can become another very effective tool for management because the group can provide useful information and feedback on how to improve the effectiveness of marina services. There can be more understanding and

less grief when slip rates need to rise. Also important, participating customers will help to police and control other customers.

TRAINING AND EDUCATION

Sharp business management means going after more training and education for marina people, including owners, managers and other staff. Plenty of opportunities already exist — college courses, trade associations, professional management, and the International Marina Institute.

More Efficient Marina Use of Space

ON LAND

Store more boats and expand access for the public with profitable dry rack storage. Sell cubic feet on land for storage. Move the cars off the waterfront. Why use valuable waterfront space for empty automobiles. Instead, devote the waterfront to people and to the things that people want to do.

ON THE WATER

Consider charging boat customers by the square foot. Include in each boat's area the square foot of the boat, half of the dock/pier cost and half the fairway dedicated to the boat. This approach will do two things.

a. The marina will have a fair, more reasonable way to understand what it costs to own and operate the facility.

b. Once area cost is known, managers will look for ways to become more efficient to service more boats. Don't say, "So what, if a 27 footer is in a 40-foot slip? It will pay the 40-foot slip rate, so I'm not losing any money." Stop kidding whom. The 27-footer is losing money to that marina. Does it buy as much fuel as a 40-footer? How much anti-fouling paint does it buy? What's the difference in price for haulout? Add it up. Every larger boat that can be accommodated will outpay any smaller boat.

GET SMALL BOATS OFF THE WATER

Any marina with many small boats should look into dry stack storage to release water surface for bigger boats. At the very least, consider eliminating fingers between the small boats and look at stern mooring, such as the frog hook system — a neat device for small boats.

WHAT ABOUT MEDITERRANEAN MOORING?

When you really get space crunched, go to Europe and see what they do. They don't have fingers between any of the slips. Even the big yachts are moored stern to the pier; and they sell a lot of boat fenders too. Dock fingers use up a lot of space that cannot be occupied by boats. We're not going to have that much new marina space in the future.

Public Sector Marinas

SPECIAL ADVICE TO PUBLIC SECTOR MARINAS

Here are some things public marina managers can do and do well. If the marina can control its own funds in a dedicated revolving account with surplus carryover from year to year, the marina should do well. If marina management has the independence to hire its own staff and a budget for staff training, customers will be more satisfied with the service. If maintenance money is accessible fast when it's needed, the marina will have lower maintenance costs and the dockage will last longer. And always remember, for the public marina to do well in the service business, customers must be put first — and that's the toughest thing for any government agency to do.

Summary

CHARACTERISTICS OF LEADING MARINAS IN THE DECADE AHEAD:

- Customer service oriented.
- Environmentally aggressive.
- Sharpening management through training and education.
- Computer power user.
- Active in the community and marine trades associations.
- Reorganizing dockage.
- Expanding capacity for being more efficient
- Making money.

I'm very bullish on marina future. The future of recreational boating and its boat manufacturing and retail industry will be decided in each marina.

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Factors Affecting Marina Development Operations and Management

Water Quality Issues

*Nancy Richardson Hansen** *and Nina Carter***

The Puget Sound Water Quality Authority identified non-point pollution from marinas and recreational boating as an issue to be considered as part of its comprehensive planning process[1]. This paper describes several initiatives in the 1987 Puget Sound Water Quality Management Plan that were designed to address pollution from marinas and recreational boats. It also discusses the respective responsibilities of the marina industry, the boating community, and state and local government in carrying out these initiatives.

Water Quality Issues

The type of pollution most commonly associated with recreational boating is the discharge of raw or partially treated human wastes which can contain pathogens harmful to humans. Such discharges can lead to the closure of swimming areas and shellfish beds if they elevate fecal coliform bacteria levels in surrounding waters beyond acceptable limits[2]. Admittedly, the relative contribution of fecal coliform from boat discharges as opposed to other sources is often difficult to quantify. However, there are cases (particularly where boats congregate in small bays or inlets), where sewage discharges from boats have contributed to the closure of shellfish beds around Puget Sound and in other areas (PSWQA, 1988).

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[1] The Puget Sound Water Quality Authority is a state agency reauthorized in 1985 by the Puget Sound Water Quality Act (RCW 90.70). This act directed the agency to develop a comprehensive water quality management plan for Puget Sound, including recommendations for the management of non-point source pollution. The Authority is based in Seattle, Washington, and has jurisdiction in the 12-county Puget Sound area.

[2] Fecal coliform bacteria are found in the intestinal tracts of mammals. While not harmful itself, this type of bacterium indicates the possible presence of other pathogens that can be harmful to humans.

The construction and operation of marinas can also affect water quality. Two water quality effects that generally occur within marinas are reduced dissolved oxygen and increased temperature, which result in large part from the poor tidal flushing characteristic of marinas (Cardwell, 1981). Depending on the location, construction of marinas may also destroy or degrade salt marshes, eelgrass beds, and other intertidal and shallow-subtidal habitats (PSWQA, 1988). Of particular concern at some marinas is the discharge of untreated sewage from"liveaboards" (boats used as full-time residences) where residents do not use a holding tank or onshore restroom facilities.

Other pollutants associated with marinas and recreational boating include oil and grease, gas, metals in anti-fouling paints, organic chemicals, detergents, plastics, and other garbage (Cardwell, 1982; PSWQA, 1988). While less of a threat to human health, these pollutants can have detrimental effects on marine life.

Initiatives in the Puget Sound Plan

The 1987 Puget Sound Water Quality Management Plan launched several initiatives dealing with marinas and recreational boating. These elements (numbered MB-1 through MB-8 in the Puget Sound Plan) are contained within the overall program addressing non-point source pollution. State agencies responsible for carrying out the tasks in these elements include the State Parks and Recreation Commission, the Department of Social and Health Services (DSHS), and the Department of Ecology. Those elements of particular interest to the boating community are described below.

Two initiatives deal specifically with marinas. One directs the Department of Ecology to revise the state shoreline master program guidelines to include specific standards for the siting, design, renovation, or expansion of new and existing marinas. Standards for siting new marinas will be designed to prevent impairment of commercial and recreational shellfish beds. Ecology will also develop regulations requiring the use of best management practices to control pollution from boat repair facilities associated with marinas and recreational boating. Finally, local governments will be asked to place conditions on shoreline permits for new marinas, requiring the marinas to conduct boater education activities and to provide adequate boat sewage disposal facilities.

Under the other initiative dealing with marinas, DSHS is drafting a model ordinance for voluntary use by local governments that would require adequate means of sewage disposal for liveaboards at public and private marinas. This ordinance would include provisions such as "sewer hookups," on-shore restroom facilities, required pump-out use, or other appropriate means.

Other elements in the Puget Sound Plan deal primarily with the issue of providing for adequate sewage disposal from boats. One element established a "Boaters Task Force," which includes representatives from the boating community, state agencies, marina owners and other interests. The Task Force was given two assignments.

First, it was asked to develop a boater education program to be administered by State Parks. The education program designed by the Task Force has three phases:

1. A fact-finding stage, in which boaters' waste disposal practices are determined by a survey
2. A program design stage, in which educational materials and an overall delivery strategy are developed for target audiences
3. An implementation and evaluation stage, in which State Parks works with local governments and other appropriate groups to carry out the educational program over the long-term

Second, the Task Force was asked to draft legislation addressing the need for sufficient pump-out facilities at existing and new marinas. This legislation, which will be submitted to the 1989 session of the Washington State Legislature, establishes a program for marina operators to apply for funds to install sewage pump-out stations. This program is part of a much larger legislative package that would provide increased funding for a variety of boater services.

To broaden the information base on the water quality effects of recreational boating, the Puget Sound Plan directs DSHS to conduct an ongoing water quality monitoring program in some boating areas. This monitoring effort will help determine the extent of contamination from boats, provide information for use in the boater education program, and help evaluate the effectiveness of various control methods. DSHS began monitoring at five marinas during the summer of 1988.

The Puget Sound Plan also identifies several initiatives with longer timelines for implementation. State Parks will work with the Coast Guard and other appropriate agencies to develop a strategy to ensure compliance with federal Marine Sanitation Device regulations, including the possible transfer of enforcement authority to the state. By 1992, DSHS and Ecology will evaluate the need for "no discharge" and "no anchorage" areas in Puget Sound based on the success of the previous initiatives under this program. If the availability and use of pump-out stations increase between now and then, there may be no need for discharge or anchorage prohibitions.

Involvement of the Boating Community

Although the Puget Sound Plan has outlined an ambitious program for preventing non-point pollution from boats and marinas, its effectiveness depends to a large degree on the involvement and support of the boating community. Most people who are aware of the issue agree that "nobody wants to pollute." The challenge lies in educating the boating community about water quality issues and then making it easy to practice good waste disposal.

The Authority's initiatives place significant responsibility on both the marina operator and the boater. The proposed shoreline master program amendments will further integrate a concern for water quality into the marina permitting process. Proposed legislation for consideration in 1989 would provide an opportunity for marina operators to voluntarily equip marinas with pump-out stations or other appropriate waste disposal facilities. The model ordinance for liveaboards, if adopted by local governments, would also require some changes at marinas. In most cases, however, existing marinas could make incremental changes over time; likewise, new marinas will have the opportunity to build water quality considerations into construction and operation decisions.

There are several voluntary steps which marina operators can take immediately to help reduce the effects of boating activity on water quality. These include:

- providing convenient garbage receptacles and waste oil recycling facilities at marinas;
- providing adequate means for boats to dispose of sewage — a well-located, well-maintained pump-out station and accessible shoreside restroom facilities. (Simple, legible signs directing boaters to the pump-out, as well as clear instructions on its use would also be helpful.);
- incorporating rules to protect water quality within the general rules and regulations of the marina (addressing sewage disposal, other waste disposal, and boat maintenance practices); and
- participating in the educational activities sponsored by State Parks, local government, or other groups.

However, even the most conscientious effort on behalf of the marina operator will not solve the problem unless the boater gets involved. For this reason, the boater education program carried out by State Parks places great emphasis on reaching the individual boater with the non-point pollution message. Staff at State Parks have developed and widely distributed a map of pump-out facilities currently available in Puget Sound. In addition, they have given presentations to many boating groups, placed dis-

plays in several boat shows, and interviewed boaters to determine how to target educational materials.

The initiatives contained in the Puget Sound Plan are designed to help enhance the growing awareness of water quality and provide practical steps that can be taken by state and local government, marina operators, and individual boaters. Few groups stand to benefit as greatly from excellent water quality, harvestable shellfish resources, and restored marine habitat as the Puget Sound boating community. Working in support of the initiatives in the Puget Sound Plan, boaters and marina operators will be an important positive force in the long term protection of Puget Sound as both a commercial and recreational resource.

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Dealing with Garbage:
Obligations and Opportunities

*Fran Recht**

New Regulations Affect Ports and Marinas

On December 31, 1988, ports, marinas, and their users will come under new garbage handling restrictions. Mariners will be prohibited from disposing of any plastic material overboard, and the disposal of other types of materials is restricted depending on distance from shore, (see Fig. 1). All ports, marinas, fuel docks, fish plants, and other revenue generating docking facilities, no matter how large or small, are required to provide garbage facilities to accept this retained refuse. Port facilities must be "adequate," that is, they must have sufficient capacity and be located close to the vessels. While it is the responsibility of the ports and docks to provide the refuse facilities and services, these costs can be passed on to the vessel operators.

These new regulations, which also require the government to sponsor a public awareness campaign, are contained in an international treaty known as Annex V of MARPOL, and are implemented into U.S. law through the Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA). The Coast Guard is in charge of enforcing these regulations and is permitted to collaborate with other authorities in doing so. Mariners can receive fines for violations, and non-complying ports and docking facilities can be closed or have their operations restricted.The law was designed to end an ocean pollution problem that has only recently been recognized — pollution by plastic litter. Since plastic is virtually non-degradable in the ocean, the many millions of tons of plastic that are discarded from vessels each year just keep accumulating. Besides being unsightly when this plastic washes up on beaches, it is a problem causing serious environmental and economic impacts. You may have seen the recent articles in *Business Week, Time,* and *Newsweek* and also magazines that show horrible pictures of animals entangled in plastic garbage and

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mention the birds, turtles, and whales that die from eating plastic materials mistaken for food. The closing of New Jersey beaches for two weeks this year when syringes and contaminated blood packets washed ashore resulted in the estimated loss of many millions of dollars in tourism revenues. Texas spends $14 million dollars each year to clean their beaches as well as organizing volunteer beach clean-ups. Mariners have long been aware of the safety and economic hazards of plastic debris. Debris items like nets, rope, fishing line, six pack rings, plastic bags, and sheeting commonly disable propellers or are sucked into water intakes, causing engines to overheat and pumps to clog.

MARPOL ANNEX V
Summary of Refuse Discharge Limitations

	ALL VESSELS	
REFUSE TYPE	OUTSIDE SPECIAL AREAS	IN SPECIAL AREAS[1]
Plastics[2] including synthetic netting material and rope	Dumping Prohibited	Dumping Prohibited
Floating packing and lining material	> 25 miles offshore	Dumping Prohibited
Paper, rags, glass, metal, bottles, crockery	> 12 miles offshore	Dumping Prohibited
Ground paper, rags, glass, etc.[3]	>3 miles offshore	Dumping Prohibited
Food	> 12 miles offshore	> 12 miles offshore
Food comminuted or ground[3]	> 3 miles offshore	> 12 miles offshore

Though this law does place new burdens on ports and marinas, it also offers significant opportunity. At a time when the public perceives a real ocean pollution crisis and legislative interest is high, it places the ports and marinas in a leadership position in solving this marine debris problem. We hope to indicate how easy it is to provide "adequate" facilities to meet

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[1] The Gulf of Mexico is being considered for designation as a special area.

[2] Not apply to accidental loss of synthetic fishing nets, provided all reasonable precautions have been taken.

[3] Ground refuse must be able to pass through a screen with mesh size no larger than 25mm. (1 inch)

your legal obligations, increase the efficiency of your refuse handling system, save money, improve communication with your users, and by accepting a role in the public education campaign, gain widespread public recognition for your efforts.

Here we can sketch only a few ideas. There is no time to discuss the additional requirements that apply to refuse from vessels with foreign ports of call which must be sterilized or incinerated before disposal. Information about these requirements and more details about the Port of Newport project, including details of the costs of the project and a cost recovery schedule, are available in a publication called "Report on a Port-Based Project to Reduce Marine Debris," available from the National Marine Fisheries Service Marine Entanglement Research Program, 7600 Sand Point Way NE, Seattle, WA 98115. At the March 1989 meeting of the Pacific Coast Congress of Port Managers and Harbormasters in Bellingham, WA, a workshop is being planned which will allow us more time to discuss problems and possibilities. Bud Shoemake from the Port of Newport and Art Choat from the Port of Bellingham's Squalicum Harbor can also be contacted for details about their projects.

Newport's Pilot Project

The National Marine Fisheries Service knew that these new regulations would pose some problems for ports and marinas. In order to help anticipate the costs and difficulties which would be faced, the NMFS Marine Entanglement Research Program sponsored a $97,000 pilot program last year at the Port of Newport in Newport, Oregon. The Port of Newport serves 300-600 commercial fishing vessels, operates a launch ramp and a 600-berth recreational marina, and has a two-berth deep draft shipping terminal which moves logs and lumber to both foreign and domestic ports. These operations are located in physically distinct areas of the port. The suggestions that follow are taken from project experiences and are adaptable, we feel, to ports both larger and smaller than Newport's.

MEETING THE REQUIREMENTS

Though the evaluation standards are yet to be announced by the U.S. Coast Guard, ports and docking facilities must furnish enough refuse reception facilities to serve the needs of their vessels, and must locate these facilities close to where the vessels dock. Our experiences have indicated that meeting these requirements can be accomplished following simple and straightforward steps. These steps can be undertaken by yourself, an employee, a temporarily hired project manager, or by volunteers interested in this marine debris problem. In any case, it is very important that a person

be designated to take on these responsibilities and be given the full support and cooperation of management and employees. This person should:

- Assess the existing refuse handling system, considering convenience to users and identifying problems.
- Define facility needs:
  - Talk with your users and employees.
  - Observe the types of refuse being returned to port to identify recycling possibilities and equipment needs.
- Investigate the refuse and recycling service options available. (Since refuse handling is a competitive business, it may be possible to find or negotiate better cost or service options.)
- Suggest the changes that maximize service to users and allow greatest port efficiency.
- Help instigate the facility changes and inform mariners of them.
- Evaluate the new system and suggest adjustments needed.

DEFINING NEEDS

Facility needs and options will depend on:

- Number of vessels in use.
  - Estimate a minimum* capacity need of 4-6 gallons of refuse reception capacity per person per vessel per day. A cubic yard dumpster holds 216 gallons of refuse.
- Types of refuse generated.
  - Additional capacity will be needed for nets, cable, pallets, drums, and other large, industry-specific materials. Consider the equipment that may be needed to move or handle this refuse.
- The layout and access to the docking facilities.
- Availability of port resources (equipment and labor).
- Proximity to recycling markets and services.
- Possibilities of coordinating efforts with nearby docking facilities.

In defining needs, emphasis should be placed on getting out on the docks and talking with members of different user groups and your employees. This will ensure that facilities will meet defined needs, antici-

* This does not include refuse from provisioning or repair work, so additional capacity is needed to accept this refuse.

pated problems, and logistical constraints. The more users that are talked to the better, even if the same ideas or problems begin to be identified. By helping to define the refuse facility improvements, users become aware of the efforts that are being made to help them deal conveniently with the new restrictions *they* face, and they will be more likely to cooperate with your efforts. An advisory group may also be helpful in defining and implementing refuse system changes.

INCREASING CAPACITY

If existing refuse reception capacity is inadequate, there are various ways in which it can be increased. These options are listed below and illustrated in the description of changes made at the Port of Newport. To increase capacity:

- Add more or larger refuse containers such as dumpsters, trash cans, totes, or barrels.
- Use container space more efficiently (compact refuse in containers)
- Have containers emptied more frequently.
- Designate special refuse reception areas.
- Divert recyclable materials from refuse containers.

REFUSE SYSTEM CHANGES AT THE PORT OF NEWPORT

Before the project began, the port was already providing trash cans and dumpsters and paying $18,000 in solid waste disposal bills annually. Refuse handling often involved hours of port labor time. Despite these efforts, the evaluation steps led to discovery that the existing refuse handling system was insufficient and inefficient. More refuse facilities and different kinds of refuse facilities were needed. When commercial vessels were blown into port or during nice boating weekends, our trash cans and dumpsters overflowed. Fishermen needed but didn't have a convenient place to dispose of nets and line. The port needed to be able to handle a large amount of this material and wanted to find ways of accepting it without a lot of port expense. Cardboard boxes, we observed, often filled up more than half the dumpster space — leaving whole sections of the container inefficiently used. Bulky wood and metal items also used dumpster space inefficiently.

Tote boxes donated by the fish plants were placed alongside the dumpsters and clearly designated for cardboard. This cardboard is removed from the port by the refuse company at no charge, allowing the dumpsters to receive at least a third more refuse at no increased costs to

the port! Much of the metal and wood the commercial fishermen put into these bins is recycled too, again reducing solid waste disposal costs.

Fishermen suggested that a water level barge was necessary so that they could easily rid themselves of heavy items of net, metal, and wood. For $500, the port was able to adapt unused barge and greatly expand their refuse reception capacity. Having the barge in place has resulted in cleaner docks, reducing the number of dock clean-ups. Just as importantly, the port demonstrated its willingness to respond to the fishermen's ideas.

Following the suggestions of the harbormaster and port workers, a main refuse and recycling area was established near the service dock where a hoist is available. It was a perfect place for the off-loading of nets, cable, and other unwieldy items. It was a logical place since vessels tie there to use the hoist. It was also a convenient and centralized place to accumulate recyclables and place full dumpsters for emptying. *Note that having a refuse facility does not necessarily mean high costs or elaborate structures or dumpsters. Much refuse reception capacity can be created simply and inexpensively by clearing or reorganizing an area.* By placing a bin, a pallet, or simply by providing space, as long as these are conveniently located and clearly marked, large increases in refuse reception capacity can be attained. This main recycling and refuse area at the Port of Newport cost $1400 to establish. This area was very well used; we received between 35 and 50 nets this year, whereas before 3 or 4 nets might have been returned. We didn't even have to pay to get rid of them! Fishermen would come to this area to take nets and net pieces to do repairs, and community members and tourists would take whole nets, or pieces of them (sometimes with port fork-lift assistance) to be used for making baseball and golf backstops, fencing gardens, controlling erosion, covering garbage trucks, and making kids playgrounds.

INCREASING EFFICIENCY AT THE PORT OF NEWPORT

Besides recycling, other ways of increasing refuse handling efficiency were found. An investigation of our municipal refuse service options revealed that the port's workers were doing more work than was necessary — the refuse company's services could be better utilized. We found that by acquiring more dumpsters (we bought them, but could have simply rented them), the port was able to eliminate an extra refuse handling step at the commercial docks. Port workers still must replace full dumpsters on the docks with empty ones, due to port layout, but no longer have to go through the extra step of emptying the dumpsters' refuse into a large storage bin. Marina employees used to spend two or three hours daily keeping refuse containers emptied. By replacing the 50-gallon garbage cans by

1-1/2 cubic-yard dumpsters, the total refuse reception capacity was expanded by almost 7 times and virtually eliminated the handling of refuse by port workers. Now the refuse company empties the dumpsters as needed, right from the docks!

To reiterate, the Port of Newport used the marine debris project to evaluate all aspects of the refuse handling system and discovered costly inefficiencies. We found various ways not only to increase refuse reception capacity (by adding larger dumpsters, more dumpsters, recycling containers, a main refuse and recycling reception area, and a water-level barge) but to save money while providing expanded refuse services to our users. We saved money both directly, by using recycling to reduce solid waste disposal costs, and indirectly by freeing up port labor for other tasks, including recycling. Recycling work requires about 8 hours of port labor a month.

GETTING HELP AND INCREASING BENEFITS

By involving port users and port workers, and by keeping the media informed of efforts, the port or marina can gain the cooperation of its users and employees and the support of the community. This help will greatly expand awareness of the marine debris problem, increase cooperation between the community and the port, and gain the port recognition for its effective role in managing the problem. This can be accomplished by:

- Educating the users and the general public (post signs, notices, and inform mariner groups, community groups and the schools about the reasons for the port efforts and about available educational resources).
- Involving port users and workers in evaluating and improving refuse services.
- Asking mariners for their support.
- Forming an advisory group composed of community members as well as mariners. (Advisory group members are not figureheads, but people who were willing to assist with project efforts. They worked to educate and involve peers and the public. Port of Newport's advisory group consisted of fishermen, extension agents, and representatives from the refuse and recycling companies, health department, sheriffs, state police, Coast Guard, Coast Guard Auxiliary, the Chamber of Commerce, fish and wildlife agency, and the school system.)
- Informing the press of activities and progress (with phone calls and written press releases).

To make a marine debris project a positive one for a port or marina is not difficult. It takes a little attention and a willingness to act, but such efforts will pay off.

Marine Debris

The Bellingham Demonstration Project

*Patti Mullin**

The Bellingham demonstration project at Squalicum Harbor is part of an educational program developed by the Washington Sea Grant Program and funded by the Puget Sound Water Quality Authority's Public Involvement and Education Fund. The demonstration project, which focuses on the fate of vessel-generated wastes, was designed to serve two purposes:

- to increase people's awareness of garbage, its ultimate fate, and their part in disposing of their own waste responsibly.
- to reduce the rising cost of garbage service at Squalicum Harbor.

Characterizing Squalicum Harbor

Squalicum Harbor provides some 1,750 berths, with approximately 700 of these used by commercial fishing vessels and the rest by recreational vessels. Recreational vessels and commercial fishing vessels occupy separate floats, but these floats are intermixed in the harbor so that there is not a distinct area for each of the user groups.

Dumpsters (majority are 6 cu. yd. capacity) are provided at the head of each float ramp and additional dumpsters are located in the areas used by fishermen for working on their gear. A larger 20 cu.yd dumpster is provided next to the dock used for major provisioning of the vessels.

Building on the Port of Newport Project

Though every port situation is unique to some degree, much can be gained by considering the lessons learned at other ports and the methods used there. The Newport project was an important resource for me when researching a recycling system design for Squalicum Harbor.

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* Marine Debris Project, Washington Sea Grant Program, North Sound Office, Bellingham

The Bellingham project is still in its infancy. It has been researched, reviewed and accepted, but it has not yet been implemented. I would like to explain the plan for this project and point out some of the similarities and the differences between the two projects in order to show how the basic ideas can be molded to fit a particular situation. The basic underlying principles used in both projects are the same.

ANALYSIS OF WASTE-HANDLING PROCEDURES AND COLLECTION FACILITIES

This is an important first step for any project because you must know what you have in order to improve upon it. The analysis at Newport showed that improvements were needed for the existing facilities in regard to capacity, location and the collection system. The analysis at Squalicum Harbor showed that because of the large capacity dumpsters, their location, and pick-up schedule, people using them felt they were adequate.

If indeed we could discourage the dumping of wastes at sea and see an increase in the amount of refuse brought back to shore, these facilities could be adequate if the rate of pick-up were increased. However, an increase in garbage pick-up would mean a higher garbage bill. Recycling is a logical solution to this dilemma. Because of the large amount of cardboard found in the dumpsters, it was evident that sorting of just this one material could significantly reduce the volume of garbage.

MATERIALS TO BE COLLECTED

The Port of Newport and Squalicum Harbor are very similar in the type of refuse that can be sorted out to be recycled. The marketing ideas used in Newport to reduce the volume of accumulated scrap materials should therefore also work in Bellingham. These include:

- donating scrap wood for fuel supplements to needy people,
- advertising availability of scrap netting to gardening programs,
- designating the scrap metal area as a salvage area as well as an area for disposal.

MONEY AVAILABLE FOR PROJECT

This is probably one of the bigger differences in our projects. The funding of the Newport project allowed the port to make broad changes in a short period of time, without having to worry about budgeting for the project or recovering costs. The Bellingham project has no money for purchasing materials needed for additional facilities. Washington Sea Grant received $30,000 to cover the cost of developing and publishing educational materials, paying office expenses, and hiring a program as-

sistant on a part-time basis for 17 months. The money needed to purchase materials for the recycling system will come from the Port of Bellingham. The cost at this time is estimated at between $200.00 and $300.00. I prioritized designing a system that would not require much money to implement and that would keep to a minimum the time required to manage it.

For that reason, you'll notice a difference in the comprehensiveness of the two port recycling systems. Newport has a larger distribution of recycling facilities and a broader range of services.

VESSEL DISTRIBUTION

Another factor that contributes to the difference in the recycling facilities distribution is the layout of the moorage for the two ports. In Newport, the commercial fishing moorage and the recreational boating marinas are two distinct and separate areas. At Squalicum Harbor, they are mixed.

COMMERCIAL FISHING VESSELS

Newport has a water level barge that is used by commercial fishing boats for off-loading some of their bulkier refuse (like heavy trawl nets) as well as other recyclable materials. Fishermen surveyed at Squalicum Harbor said they didn't feel that a barge type of collection facility would be beneficial. This is probably due to the difference in gear type and refuse generated during fishing trips. This leads to another difference between the two ports. Newport is a base for a sizable trawling fleet working joint ventures off the coast or distant water ventures in Alaskan waters. The Bellingham fleet is predominantly gillnetters and secondly, purse seiners. These gear types usually go out for briefer one- to two-day fishing trips instead of the more extended trips of a couple of weeks made by the trawlers.

RECYCLING SYSTEM FOR SQUALICUM HARBOR

After surveying the dumpsters to determine what type of recyclable materials are predominant in which dumpsters and surveying harbor users about how much and which materials they would be willing to sort, we decided to locate aluminum collection facilities closest to recreational boating docks and cardboard collection facilities closest to commercial fishing docks. Aluminum is not a significant percentage of the material found in the dumpsters, but is a valuable material that can help to defray costs.

Wooden fish totes, like those used at Newport for receptacles, were donated to the project by local fish processing plants. These donations helped to keep costs down. A large area will also be cleared near the fish-

ermen's gear work area for the deposit of scrap wood, metal, netting, and line.

Because this system will be set up on a trial basis, it is important to set the goals as realistically as possible. By asking people to do a minimum of sorting at first and getting them accustomed to the idea, I feel the program has a better chance of success at the outset. There is always opportunity for expansion later when the system catches on and there is a willingness to participate.

The recycling system does not include glass at this time because in an effort to keep down harbor maintenance time, only materials that have ready collection markets are included. Interested parties who are willing to come to the recycling facilities and remove the materials free of charge have been found. The cleared space for scrap wood, net, and metal will have the same system as in Newport, where people are encouraged to take what they need. A scrap metal company in Bellingham has agreed to remove the metals at no cost if they accumulate to the level necessitating removal.

Lessons Learned

Although much remains to be learned once implementation of the Bellingham project begins, some important lessons have already been learned.

The analysis stage was very important. Interviewing of harbor patrons produced one unexpected result in particular. Because of the popularity of the refuse collection barge at Newport, I assumed it would also be a popular and practical idea at Squalicum Harbor. This was not the case.

Another lesson came in forming an advisory committee for the project. Some people were chosen to participate because of their enthusiasm and involvement in past programs and because of their positions in the community which would enable them to influence large groups of people. This aspect of the program has not turned out as we would have liked. It is important to solicit help from people who are genuinely concerned about the project and willing to invest some time in brainstorming and carrying through.

Cost-saving Practices

REALISTIC FACILITIES

Facility ideas that work well for one port may not be appropriate in a different situation. To avoid spending money on the wrong types of facilities, ask questions.

- Do we really need that here?

- Will people readily use it?

COMMUNITY INVOLVEMENT CAN SAVE YOU MONEY

Local businesses that are supportive of your goals may be willing to make materials or services donations.

Concerned community members can do much to enhance your program by getting involved in spreading the word either by helping to distribute educational materials or just letting other people know about it. Volunteer groups exist in virtually every community, and may be interested in helping out. Collection of the recyclable materials could be arranged through these volunteer groups or by independent collection businesses at no charge.

General Suggestions

PUBLICITY AND PUBLIC INVOLVEMENT

The importance of publicizing a new project and involving the public cannot be overemphasized. In order for people to use the new system and to be supportive of it, they must know about it. People who are involved in the creation of new projects and their implementation tend to spread the word and involve other people as well.

COLOR CODING

Because of the success of the Newport project, it is evident that fishermen readily recognize their blue color coded recycling facilities. I have suggested that Bellingham use a blue color also, to maintain the cohesiveness of port recycling efforts. If all ports designate their recycling facilities with a blue color, it is less confusing for crews that may travel to different ports and it shows a unity of effort.

REALISTIC GOALS

Be realistic when setting your goals. Important questions to ask are:

- How much money is available for the project and how much can we expect to recover?
- How much are people really willing to do?

Don't predispose yourself to failure by biting off more than you can chew at a time.

INTERPORT COOPERATION

It is important for ports that try new ideas and take on different projects to share their mistakes as well as their achievements in order to derive the maximum benefit that comes from sharing information.

Contaminated Marina Sites:
Assessing Negative Land Value

Don Grant[*]

Current environmental regulations have had an impact on the industrial real estate market. Marina developers are concerned with the net value of their property and the costs associated with developing new marinas. The basic concept of the market value of industrial real estate is evolving to include the negative value associated with residual contamination liability. This concern is compounded by numerous federal and state regulations.

Liability for Contaminated Sites

The most notable of environmental laws is the Comprehensive Environmental Compensation and Liability Act (CERCLA), the federal statute more commonly known as Superfund. Superfund was established to pay for cleaning up sites contaminated with hazardous substances. Although the law provides money to pay these costs, it also provides a mechanism by which the government may recover cleanup costs from four classes of responsible parties:

1. The present owner or operator of a site;
2. The owner or operator of the site at the time hazardous substances were disposed of;
3. Any person who arranged to have hazardous waste which he owned or possessed, disposed of, or treated at the site;
4. Any person who accepted hazardous substances for transport to the site, if that person selected the site.

Although persons are not ordinarily held responsible for actions in which they were not involved, that is not how it works in the environmental area. Mere ignorance of previous conditions is no defense. In fact, one of the few defenses available to a property owner under CERCLA is to make, "at the time of acquisition, all appropriate inquiry into the previous ownership and uses of the property." An owner who

[*] Environmental Services Group, International Technology Corporation

failed to make appropriate inquiries will have a very difficult time in proving that he or she should not pay at least part of the cleanup costs.

Besides CERCLA, the Federal Resource Conservation and Recovery Act (RCRA) contains provisions that allow the Environmental Protection Agency to bring suits against property owners. In addition, a number of states have enacted responsibility laws, which control the transfer of property.

Minimizing Risk of Liability

Environmental issues involving residual contamination must be confronted like any other business concern, and their resolution integrated into the marina development. This is accomplished through an environmental assessment of the property. An environmental assessment protects the interests of the buyer, the seller, lenders, and insurers. It is possible for the cost of a cleanup to exceed the value of the property.

The scope and extent of the environmental assessment varies with the particular situation. For instance, a new marina being built from property used previously for farming will probably not require as an extensive assessment as one being built from a former chemical warehouse. These kinds of differences are reflected in the common practice of offering *non-intrusive* studies, *intrusive* studies or a combination of both.

NON-INTRUSIVE STUDIES

VISUAL ASSESSMENT — Physically inspect the area. Look for obvious items, such as, discarded drums, fill pipes, underground storage tanks, construction and composition of existing buildings, and general appearance.

HISTORICAL REVIEW (INCLUDING AERIAL REVIEW) — Review government records for chain of title and types of business conducted. Interview adjacent owners and conduct an aerial review for overall prospective.

EXISTING ENVIRONMENTAL PERMITS REVIEW — Review government records, local state and federal for existing environmental permits, such as; Water Quality Board and Sanitation Districts discharge permits.

SITE CHARACTERISTICS EVALUATION — Look at contour of land and ascertain where hazardous substance discharges may have occurred (stained or discolored soil, stressed vegetation). Determine where outfalls (storm drains) are located and where they emanate from to evaluate type of materials that may be discharged.

AGENCY RECORDS REVIEW (LOCAL, STATE AND FEDERAL) — Review local, state, and federal records for previous violations and abatement orders of environmental laws.

SURROUNDING LAND USE IDENTIFICATION— Evaluate whether adjacent owners business could affect the marina with environmental issues, such as; a marina adjacent to a refinery.
ASBESTOS EVALUATION (EXISTING STRUCTURE) — Inspect existing structures for asbestos use. Older buildings will be more suspect.

INTRUSIVE STUDIES

ACTUAL FIELD INVESTIGATION — During physical inspection uncover suspect areas through digging, drilling, and scraping.
SOIL SAMPLING — Analyze soil composition through systematic testing of the property. Samples are analyzed by a certified laboratory.
GROUNDWATER WELL PLACEMENT AND INVESTIGATION — Drill and analyze samples of groundwater beneath the property. Usually requires three test wells to establish the water table gradient.
CHEMICAL SCREENING (VIA FIELD INSTRUMENTS) — Through the use of field instruments, many soil, air, and groundwater analyses will be completed on-site.
UNDERGROUND TANK TESTING — In existing underground storage tanks, testing will be conducted for existing leaks and the surrounding area analyzed for previous leaks.
INDUSTRIAL SEWER INVESTIGATION — Sewers, sumps and adjacent soil, located on the property, will be investigated for hazardous waste residues.

Remedial Action Costs

If residual contamination is detected from the environmental assessment then the extent of the problem should be defined. Methods to solve the problems will be examined to determine the best and least costly solution. Resolving a situation may range from simple grading to full removal of all residual contaminates. Based upon the outcome of an environmental assessment, the value of the land will be determined. This value will be the major factor in the development of any new marina.

Conclusion

An environmental assessment should be completed as a first step to determine any negative value associated with liability for residual contamination on a marina development site. While an environmental assessment does not guarantee that the site is clean, or relieve the client of all subsequent liability, it can offer reasonable assurance that the property is free of contaminants at the time of assessment.

Advances in Marina Design and Construction

Harbor Protection

*Jeffrey F. Gilman** and Robert W. Miller***

There are three basic structures that we have direct experience with in Alaskan and Northwest waters. These are 1) rubblemound rock breakwaters, including the berm breakwater version (Fig. 1), the permeable wave barrier (Fig. 2) and floating breakwaters (Fig. 3). The selection of a breakwater type is a function of several different variables including:

- Cost
- Exposure
- Type of Vessels or Structures Being Protected
- Wave Height
- Wave Period
- Wind
- Navigation Considerations
- Environmental Considerations
- Materials Availability
- Subsurface Conditions
- Water Depth at Structure Site
- Aesthetics

Smallcraft and their owners, particularly pleasurecraft, are particularly susceptible (at least psychologically speaking) to wave heights greater than 1 to 2 feet. Therefore, boat wakes are usually the design wave in a small craft harbor and wave protection must be thorough. Long period swell does not affect small craft to the extent that short steep waves do. In contrast, large commercial vessels can handle larger waves although attention must be paid to mooring line forces caused by a variety of wave periods and heights. Typically, we use a wave height limit of 3 feet for

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Figure 1. Berm Breakwater at St. George, Alaska

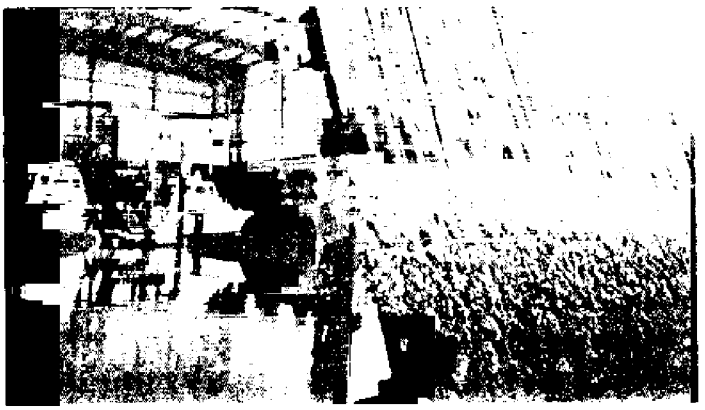

Figure 2. Permeable Wave Barrier at Garibaldi, Oregon

Figure 3. Floating Breakwater near Juneau, Alaska

large vessels. For the breakwater designer, the main effect of these considerations is that a small craft harbor protected by a breakwater must have good protection from waves diffracting around the ends of the breakwater and must keep overtopping of the breakwater to a minimum. Because of the better seakeeping characteristics of large vessels, they can generally get away from the dock before the height of a big storm and, therefore, have less need for protection from diffracting and overtopping waves.

Table for Breakwater Selection

SITE CONDITIONS	TYPE OF BREAKWATER		
	Rubble-Mound	Permeable Barrier	Floater
Hs > 6-8 feet	X	—	—
3-4 feet < Hs < 6-8 feet	—	X	—
Hs < 3-4 feet	—	—	X
Tp > 8 seconds	X	—	—
3-4 seconds < Tp < 8 seconds	—	X	—
Tp < 3-4 seconds	—	—	X
Circulation	—	X	X
Poor Bearing Soil Strata	—	X	X
Fish Passage	—	X	X
Deep Water	—	X	X
Marine Habitat	X	—	—
Shallow Bedrock (or difficult driving conditions)	X	—	X

Note: Hs = Significant Wave Height; Tp = Spectral Peak Period

In general, rubblemound breakwaters are best for the open, exposed coasts of California, Oregon, Washington (including the Straits of Juan de Fuca), the open coasts of British Columbia and Alaska, and many of the larger inland water bodies of Alaska, such as Cook Inlet or Prince William Sound.

The permeable wave barrier is often the optimum solution for most of the remainder of the West Coast's inland waters including some lakes, while the floating breakwater is best only for very protected waters not subject to any kind of long period swell. A floating breakwater can provide good protection against boat wake chop in a larger harbor, or in a limited fetch environment in inside waters where shorter period "chop" predominates.

Where wind protection of any kind is desired, the permeable wave barrier, or a high-crested, rubblemound breakwater is best. Where environmental considerations are paramount, either the permeable wave barrier or the floating breakwater is best, unless the creation of habitat is desirable which the rubble-mound breakwater provides.

The aesthetics questions are somewhat subjective. We have been told by one private marina developer in the Northwest that a rubblemound breakwater is absolutely essential for marketing the marina, presumably because of the feeling of security a mass of rock provides. On the other hand, rubblemound breakwaters are anathema, from an aesthetic standpoint, to private developers in Hawaii. We would like to present three case histories to illustrate the selection, design, and construction of the three breakwater types represented here.

Case Histories

ST. GEORGE

St. George is one of two populated islands in the Pribilof Islands in the Bering Sea. Because St. George is located in the midst of the largest concentration of bottomfish in the world and lacks an infrastructure for economic development, the state of Alaska funded the design and construction of a boat harbor on St. George. Faced with one of the most severe wave environments on earth, a lack of large armor stone, and limited funding, Peratrovich, Nottingham and Drage (PN&D) refined the "berm breakwater" concept for the project. Following an exhaustive design process and three difficult construction seasons, the breakwaters were completed in late 1987. St. George is proceeding with the development of their harbor with PN&D assisting in the design of inner harbor and upland facilities including docks, boat ramps, and outfall line, water wells and distribution systems, bulk fuel facilities and roads.

Breakwater design is not an exact science. Therefore, the best tool for designing breakwaters is the laboratory where scale models of the structure can be studied and altered so as to optimize the design for the environmental conditions to which it will be subjected. The St. George breakwater was subjected to one of the most rigorous modeling programs any one structure has ever undergone due to the lack of prototype experience with berm breakwaters and the knowledge that the Bering Sea is probably the most severe wave environment on Earth. Accordingly, the design was tested in physical laboratories in Holland, Canada, Denmark, and the United States. The testing was inexpensive relative to the total design and construction budget, while the results obtained were indispensable for the success of the project (Fig. 4).

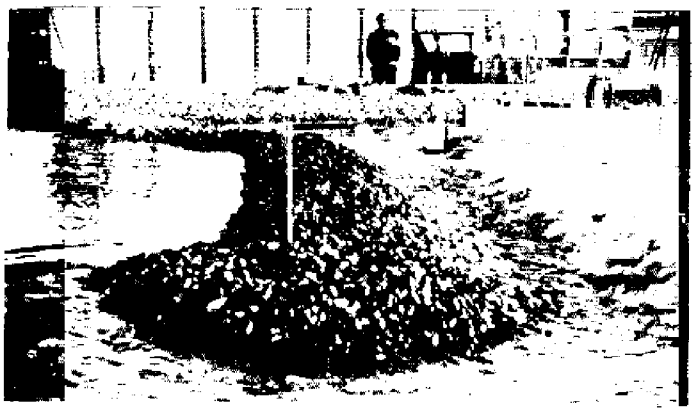

Figure 4. Physical Model Testing of St. George Breakwater at Delft Hydraulics Laboratory, Holland

The harbor is situated on a sandy coast. The siting and configuration of the harbor had to take the shifting nature of the seabed into account in order to ensure the stability of the breakwaters and to minimize maintenance dredging costs. Detailed studies, including dye studies in the physical model, were carried out. To prevent subsidence of the breakwaters in the sand, a 6-foot "filter" of quarry run fines was placed on the seabed underneath the breakwaters themselves.

St. George is a very important seabird and marine mammal habitat. The Audubon Society has cited the High Bluffs area on the north side of the island as "perhaps the most spectacular seabird colony in the world." Because of its environmental significance and sensitivity, the harbor project was designed with due consideration for protecting the environment both during construction and after the harbor is in operation.

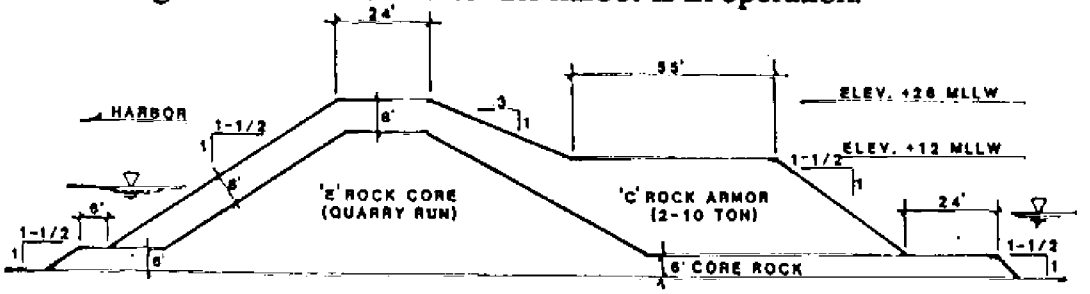

Figure 5. Typical Berm Breakwater Cross Section

The berm breakwater is so named because of the mass of armor stone placed in a berm on the seaward side of the breakwater (Fig. 5). Most damage to breakwaters occurs either as a result of the "downrush" of the wave, which plucks armor stones out of the face of the breakwater, or as a result of overtopping, which washes armor out of the backslope of the breakwater. The berm breakwater resists both modes of damage more effectively than a conventional breakwater without the berm. As a storm

wave attacks the breakwater, it first encounters the porous berm. As it moves into the berm and through the mass of armor stones, the wave "gradually" loses its energy so that, by the time it reaches the smaller core material, it has little energy left with which to displace either core or armor stones in the "downrush" of the wave. In addition, there is little energy left to overtop the breakwater's crest.

In mid-December of 1987, after the two outer breakwaters had been completed at St. George, a severe storm struck the Pribilofs with wave heights in excess of 40 feet and with spectral peak periods of up to 17 seconds. Even though the wave history record is short, these are the most severe wave heights on record for the Bering Sea. The breakwaters performed as designed.

St. George Harbor, when fully developed, will be a full-service port offering all the necessities and most of the amenities required by the Bering Sea fleets. It also guarantees the economic future of the islanders and is a pronounced step in the state of Alaska's efforts to retain the economic benefits of the fisheries resource locally. In addition to these benefits, the low cost and high stability of the breakwaters protecting the harbor imply that small communities in many other places along the West Coast can now afford harbors by using locally available labor and materials.

GARIBALDI

We were hired in 1979 to provide civil and structural engineering for the new Garibaldi Coast Guard Station on Tillamook Bay in Oregon. This site is just inside the bar and is protected from Pacific Ocean swells. The design wave for this site was 3 feet. The purpose of the breakwater here was to provide protection for the Coast Guard's boat haulout area and moorings in shallow water. Roy Peratrovich conceived of a design that would employ a solid wave board placed at an angle on a frame supported by vertical and battered steel piles. The wave board would extend below the water surface far enough to block the 80% to 90% of the wave energy which occurs near the surface. Our investigation of this system was prompted chiefly by environmental concerns for improved harbor sanitation and reduction of the great expense of large rock fills. The traditional rock breakwater prevents basin flushing and causes stagnation in the harbor. The rock breakwater configuration also occupies large bottom areas and hampers or prevents future basin development.

Our permeable wave barrier model testing established basic design criteria regarding wave height, period, run-up and forces for various structural configurations. From these criteria, suitable structural solutions

and use limitations were developed for different soils conditions, water depths, and other factors.

Preliminary testing was performed in a wave tank which is 16 feet long by 1 foot wide and 2 feet deep (Fig. 6). By use of breakwater models with scales of 1:15 and 1:25 (Fig. 7), we were able to study waves which are similar to those common to the inland waters of the Pacific Northwest. These include waves up to 5 or 6 feet high with periods ranging from 2 to 5 seconds.

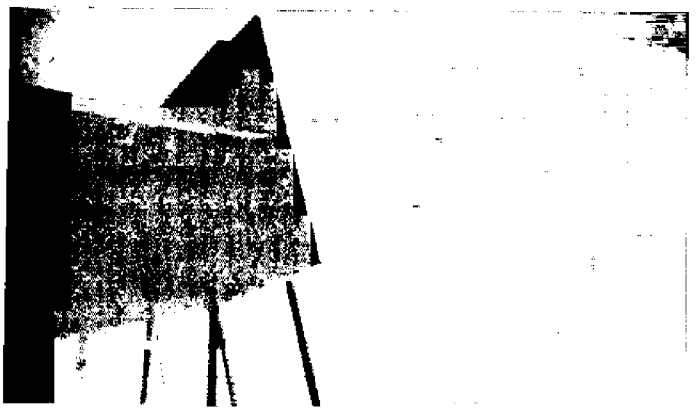

Figure 6. Physical Model Testing of Permeable Wave Barrier in Anchorage, Alaska

This breakwater was built in 1980. For reasons still unclear, the Coast Guard elected to install slotted wave boards on the breakwater rather than the solid wave boards designed. Apparently, it was thought that slotted wave boards would be less expensive because of the smaller amount of material used, but might still provide enough wave dissipation to protect the facility. In any event, the slotted wave board produced rougher conditions behind the breakwater than was desired and the Coast Guard subsequently had the solid wave boards installed.

In December of 1986, a severe storm struck the Oregon coast, producing waves up to 6 feet high at the breakwater. According to a letter from Boatswain Mate First Class R.L. Spencer, "In December of 1986 we had a storm move in from the southwest which created high winds and flood warnings from five rivers. We observed approximately 5 to 6 foot waves, which when mixed with ebb and flood runoffs, were breaking over the wave barrier. The ebb runoffs were between 6 to 7 knots, which were caused by the flooded rivers. After the storm ceased, the station engineers inspected the permeable barrier for any damage and found none. So, to this day, there still hasn't been any maintenance required on the wave barrier and we do not expect any in the future."

Recently we visited the facility and found it in good shape. Fouling of the wave board is the only feature possibly requiring maintenance cleaning at some point in the future.

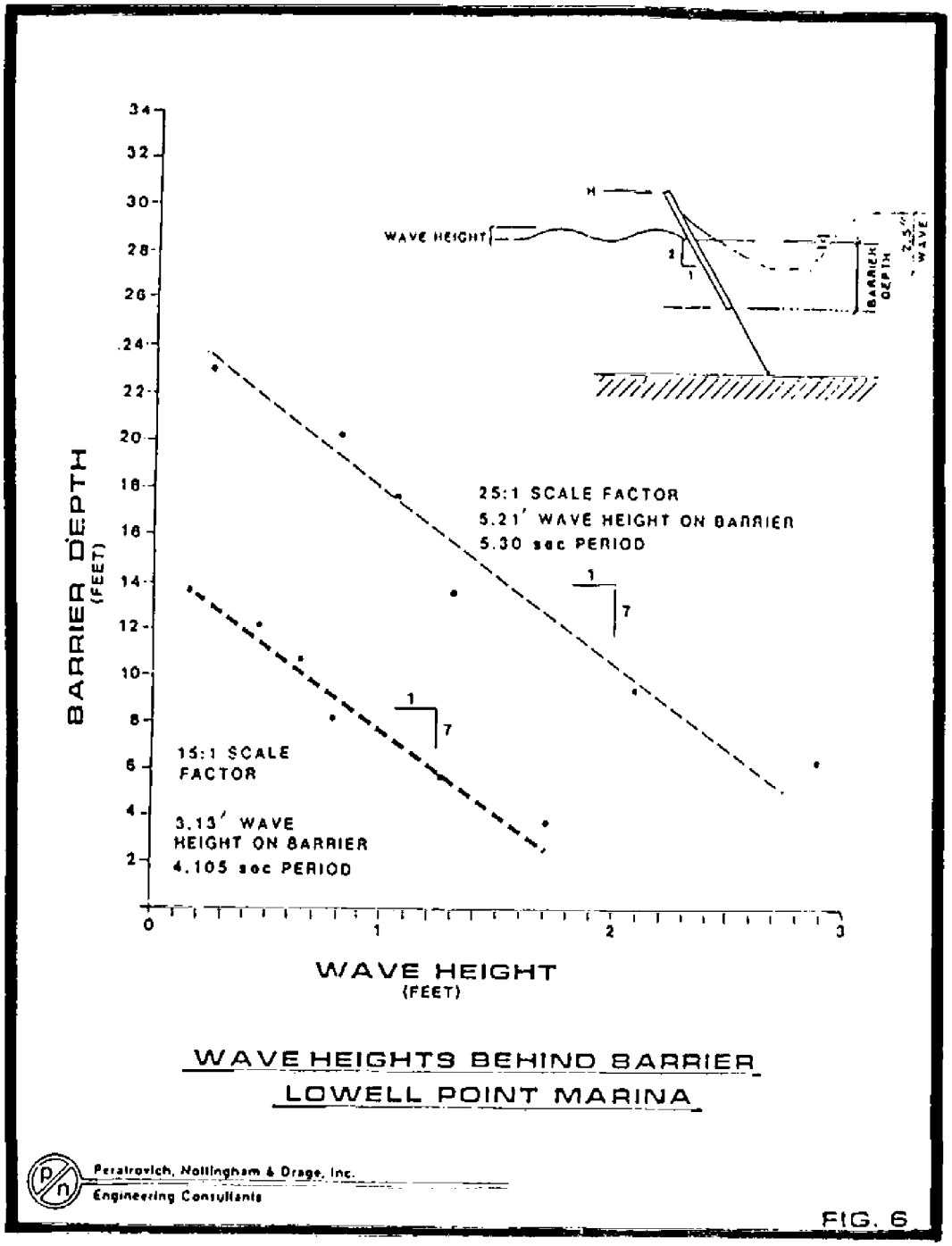

Figure 7. Typical Site-Specific Permeable Wave Barrier Design Criteria for a Breakwater at Seward, Alaska

Based on the our experience with the Garibaldi breakwater and new advances in pile foundation design and construction techniques (particularly the spin fin pile), we now feel that the permeable wave barrier can be designed for waves up to 8 feet in height. The permeable wave barrier generally has the following advantages:

- Allows natural basin flushing
- Occupies a minimum of harbor bottom area
- Minimizes superimposed loading on submarine soils
- Reduces the breakwater's susceptibility to seismic damage
- Reduces construction costs and time
- Does not require rock quarrying and related activities
- Uses methods and materials of construction similar to docks
- May be attached directly to existing dock
- May be used as part of foundation system for future dock
- Can be removed readily for modification or expansion
- Allows construction in deep water
- Can provide mooring directly to the breakwater
- Can be constructed with steel or prestressed concrete piles
- Can be constructed with treated timber or concrete panel face

For a similar design being constructed nearby, we would refer you to the the Carrillon Point Marina now being constructed on Lake Washington for the Skinner Corporation.

Floating Breakwater Case Histories

Floating breakwaters have been a regular feature in Puget Sound and inland Alaskan waters for some time, so we have a lot of prototype data with which to work. Generally, the performance of these structures has been good on very protected inland Northwest waters but has been poor in Alaska and other exposed waters.

The most important problem with floating breakwaters has been the failure of the connections holding individual floating units together. Part of the problem with floating breakwater design is that it is difficult to obtain full agreement between theoretical model tests and prototype performance. This is due to problems in modeling mooring system forces, damping at resonant frequencies in breakwaters, and questions about the effect of the structure on the incident wave field.

There are several factors affecting performance including beam, or width, of the breakwater, which may be the most important factor because of its relationship to wavelength. A breakwater width equal to around one-half the wave length seems to be the most effective, but results in too great a cost for most practical applications. The draft of the breakwater is also important because most of the wave energy occurs near the surface. Mass has an effect on the resonant frequencies of the breakwater. Depth of water can be important, particularly as it is not well understood how floating breakwaters perform in shallow water. Shape of the breakwater units is important; some breakwaters have wells which dissipate energy when the wave resonates in the cavity. Other breakwaters, such as floating tire breakwaters, dissipate energy through damping due to motion of individual elements. Mooring restraints can have an effect on motion of a floating breakwater, particularly sway, or horizontal motion. Often physical model tests are the most effective and reliable method for determining the performance of a proposed floating breakwater.

Our own specific experience with floating breakwaters is varied. One particular structure of note is the passenger unloading facility at Young Bay on the north end of Admiralty Island (Fig. 8). This dock is actually a modified and ballasted barge which acts as both a dock and breakwater for a vessel which discharges passengers onto the protected side of the

Figure 8. Ballasted Barge Floating Breakwater for Passenger Unloading on Admiralty Island, Alaska

dock. As this site is subject to waves up to 6 feet in height and with 5 to 6 second wave periods, it has a heavy-duty mooring system composed of two steel, three-pile dolphins employing spin-fin pile tips. Steel collars welded to the barge ride up and down on the vertical piles of the dolphins. This system provides more restraint in the sway or horizontal mode than a typical anchored floating breakwater. Consequently, the barge acts more rigidly than a typical floating breakwater anchored with chain, resulting in both increased wave attenuation and larger mooring loads. Information gained from wave hindcasting and computer refraction analysis was utilized to compare various alternatives and select the best possible design.

Costs

Finally, we would like to summarize some cost data. These are very general and are presented only to give you an idea of relative costs when considering the different breakwater types available. Of course, there are many variables when it comes to costs (refer to the list presented previously). Where rock is cheap and concrete expensive to import, the rubblemound breakwater will be constructed of rock. Where concrete is cheap and a rubblemound breakwater is called for, the concrete may be less expensive than rock. There is a general limit to the size of rock available naturally for armor rock: about 20 tons. However, with the new berm breakwater design, there should rarely, if ever, be a need to specify armor stone that large. Note that the St. George armor stone averaged 6 tons. Similarly, for permeable wave barriers and floaters, materials should be appropriate for the area and the application.

Approximate Relative Costs for Breakwater Types Discussed

Conventional Rubblemound Breakwater..... $10,000 per linear foot
Berm Breakwater.....$4,000 - $5,000 per linear foot
Permeable Wave Barrier.....$1,500 - $3,000 per linear foot
Floating Breakwater .....$1,500 - $3,000 per linear foot

Conclusion

While breakwater design in the past has been more of an art than a science, there have been many advances in the field in the last 10 years and, as owners, you should examine all options available. With proper engineering, there is no reason a facility cannot be well protected from even the harshest West Coast wave climate.

Dredging Techniques

Sheryl Carrubba and Ken Patterson***

This paper addresses three areas. The first topic is types of dredging equipment. The second topic is a description of "cost sharing" as it relates to Public Law 95-662. The third is the process for public notices, including a list of related environmental laws and regulations.

Dredging Equipment

The mission of Portland District with respect to navigation is to maintain federal channels and harbor projects at their authorized depths. We are concerned primarily with maintenance dredging, but in most cases new work and maintenance dredging are accomplished by the same types of equipment.

The choice of a piece of equipment is dependent on the site conditions. Some important variables include:

- Traffic conditions
- Ocean swell
- Obstructions in dredging area (pilings, docks, etc.)
- Type of material
- Disposal options or requirements

There are three basic dredge types:

- mechanical
- hydraulic
- airlift or pneumatic

A fourth much less common type is the agitation dredge.

Mechanical dredges include backhoes and bucket-type dredges. They excavate by the cutting action of the bucket teeth and carry material from the dredged surface in the bucket.

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The disposal distance for backhoes is limited by the boom length, but if a backhoe is used in combination with dump scows or trucks, the disposal distance is virtually unlimited. Equipped with specialized buckets, backhoes can be used for other types of navigation project construction.

Probably the most familiar mechanical dredge is the clamshell dredge. Clamshell dredges are usually barge-mounted and used in combination with dump scows. They are not self-propelled, so they are not good for working in high traffic areas. Clamshells are effective in tight quarters — around docks and piers. They are good for tight silts, rocks, trash, and other debris. Because consolidated materials come up practically in situ, clamshells are very effective in silts. They are often used in contaminated sediments for this reason. There is still turbidity, however, caused by lifting the bucket through the water. There are special buckets constructed to reduce the loss of sediments from the bucket for use in contaminated sediments.

A clamshell and barge operation is particularly cost effective when the in-water disposal area is a long distance from the dredging site. By having the right combination of tugs and scows attendant to the crane, the dredge can work virtually continuously while the scows cycle to the dump. Bucket sizes range from 5-50 cubic yards.

Two other types of mechanical dredges are Sauerman and Dragline dredges.

A Sauerman dredging operation uses a highline, a haulback line, and a deadman with pulleys to cast the bucket for dredging and retrieve it. Material dredged is deposited in front of the dredge to be carried away to the final disposal area by either scrapers or loaders and trucks. A dragline dredge has a bucket that is cast out by the crane operator and hauled back. The dragline can deposit material a crane-boom length away, where is is hauled away or worked by earth moving equipment back into the disposal area.

The second major category or basic dredge type is the hydraulic dredge. Hydraulic dredges lift material through the pressure of the atmosphere and the vacuum created by centrifugal pumps. The two types of hydraulic dredge used in the U.S. are the pipeline dredge and the hopper dredge.

The cutting action of a pipeline dredge is provided by the cutter head. There are various configurations of blades and teeth to handle a range of materials and dredging conditions. Pipeline dredges are not self- propelled. Use of submerged and quick break lines can reduce the obstruction problem in high traffic areas.

Pipeline dredge discharge can be in-water or upland. A large pipeline dredge with a 24-to 30-inch diameter discharge pipe can typically pump

approximately 5,000 feet without a booster. Pumping distance is dependent on a number of factors, including type of material and horsepower of pump. Use of booster pumps to increase pumping distance increases costs by decreasing dredging efficiency.

Confined disposal areas with several cells allow for adequate settling of solids. This is particularly important when dredging fine material. Discharge from the disposal area is typically back into the waterway. Unconfined disposal of sand is sometimes used for beach nourishment and/or erosion protection. Sands settle out quickly, causing little more than local turbidity.

Because pipeline dredges move material by creating a slurry of 10-20 percent solids, they may not be the best choice for moving contaminated sediments, depending upon the type of contaminant.

Pipeline dredges come in a variety of sizes. Some are designed to be portable by truck or rail.

The second major type of hydraulic dredge in use on the West Coast is the trailing arm hopper dredge. Hopper dredges can work in high swells and waves. They are self-propelled so they are also suitable for use in high traffic areas. They dredge by moving at 1 - 2 knots, trailing drag arms behind. A slurry is pumped into the hopper, where the sediment settles and the effluent is discharged over weirs.

There are a number of different configurations for dragheads, depending on the material to be dredged. There are draghead designs for sands, silts, and coral.

Some hopper dredges are equipped with pump ashore capability, but most of the time, material in the hoppers is dumped through the bottom of the ship to in-water disposal sites. There are two configurations for hopper dredges. The first has multiple hopper bins running the length of the vessel. While disposing, hoppers must be opened in a sequence that insures stability of the vessel. The second type of hopper dredge uses a split hull design with a single large bin.

The Portland District operates and maintains two hopper dredges. The larger of the two is the dredge *Essayons*. She has a 6,000 cubic yard capacity, with a length of 350 feet, a beam of 68 feet and a dredging depth of 34 feet to 80 feet. The dredge *Yaquina* is smaller - 875 cubic yard capacity - and was actually designed in length so that she could maintain the turning basin at Brookings, Oregon.

Generally speaking, hopper dredges are most efficient in areas where they can dredge long shoals with a minimum of turns, with in-water disposal sites within two to four miles.

The third major type of dredge is an airlift dredge. It lifts material by hydrostatic pressure and compressed air. Pneuma Pump is a trademark

name of an airlift pump. Material flows toward the pump, with no aggressive excavation involved. It works best in free-flowing material and is good in tight quarters. It is desirable in contaminated sediments because there is a minimum of water entrained, and because it causes minimal disturbance of adjacent materials. A barge-mounted airlift pump operation would include discharge to an adjacent barge. The airlift pump is very limited in discharge line length.

The final type of dredge is the agitation dredge. The *Sandwick* is an example, used in specific locations in Portland District. She is a modified landing craft and is outfitted with two high HP engines. After setting out two to four heavy duty anchors, the baffle plate is lowered to direct the energy of the wheel wash downward. The agitation suspends material, which is subsequently carried away by currents. The use is limited to depth of about 16-20 feet in areas of good tidal flushing or stream current. Sediments must be suitable for in-water disposal. We have found it particularly useful for clearing entrances to small boat basins.

Another example of an agitation dredge is the "Sandwave Skimmer." In 1987, Portland District began experimenting with a new design for removing obstructing peaks of sandwave shoals. It is a barge-mounted pumping system, propelled through the water by a tug. Water is jetted from a submerged boom and material is moved from the sandwave peaks to the adjacent troughs.

Cost-sharing

The second major topic of this paper is "Cost-sharing." Public Law 95-662, the Water Resources Development Act of 1986, describes the process for authorization of new federal projects. Requirements for cost-sharing are summarized below.

Study Cost-sharing is as follows:

- Reconnaissance Study - 100% federal
- Feasibility Study - 50% Federal and 50% nonfederal

Nonfederal cash contribution during construction is determined as follows:

- Channel deepening to 20 feet - 10% of construction cost
- Channel deepening between 20 and 45 feet - 25% of construction cost
- Increment of deepening in excess of 45 feet - 50% of construction cost.

Additional cash payments over 30 years are required in the form of 10 percent of construction cost, with interest, less the value of lands, easements, rights-of-way, relocations, and dredged material disposal area.

Cost-sharing for operation and maintenance once a project is completed is as follows:

- Channel maintenance to 45-foot depth - federal 100%, and nonfederal 0%.
- Increment of channel maintenance in excess of 45 feet - federal 50% and nonfederal 50%.

Public Notices

The third major topic of this paper is the procedure for Public Notices.

The following description of laws and regulations is applicable in the preparation, coordination, and processing of environmental compliance documents required by federal law for operation and maintenance of channels and harbors. These laws and regulations are the basis for our public notice and coordination requirements and the environmental studies that are conducted for our projects. They are also the basis for restrictions at some of our projects to protect environmental resources.

APPLICABLE LAWS

NATIONAL ENVIRONMENTAL POLICY ACT

Projects are reviewed to determine if they are in compliance with the National Environmental Policy Act (NEPA). NEPA compliance is accomplished by our preparation and review of an Environmental Assessment (EA) or Environmental Impact Statement (EIS) and Finding of No Significant Impact (FONSI) or Record of Decision (ROD), respectively, depending on the significance of the action.

CLEAN WATER ACT: SECTION 404

Evaluations are prepared to address the water quality effects of all non-ocean disposal activities. These evaluations pertain to in-water disposal and return water from upland disposal sites. The affected states review the 404 Evaluation and issue the Section 401 Water Quality Certification.

MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT: SECTION 103

Evaluations are prepared as to source of material, sediment type and quality, and dredge quantities for activities involving the transportation of dredged material for ocean disposal. (Also known as "Ocean Dumping Act.")

COASTAL ZONE MANAGEMENT ACT: SECTION 307

Determinations (brief reports addressing the applicable portions of local land use plans to the planned dredging/disposal activities) are prepared for projects occurring within a state's coastal zone or having an effect on the coastal zone. The affected states review the report and evaluate our determination for concurrence.

FISH AND WILDLIFE COORDINATION ACT

Operation and maintenance activities are reviewed on a periodic basis, or in conjunction with a Public Notice, by federal and state Fish and Wildlife Agencies to determine current project compatibility with Fish and Wildlife Resources and Programs.

ENDANGERED SPECIES ACT

All activities are reviewed by the U.S. Fish and Wildlife Service and National Marine Fisheries Service to determine if any endangered species or their habitats may be affected. If any species or habitats are identified, we prepare a brief biological assessment, which is reviewed by these agencies. If no effect is determined, the agencies provide us with an Endangered Species Clearance Letter.

CULTURAL RESOURCES ACTS (5 Total)

All activities are reviewed to determine potential effects on historical or archaeological resources. A report or letter is prepared describing the effects, or lack of effects, on cultural resources and is reviewed by the State Historic Preservation Officer (SHPO). If no effect is determined, the SHPO then issues the Clearance Letter.

APPLICABLE REGULATIONS

- 33 CFR PART 230 (ER-200-2-2). *Environmental Quality, Policy and Procedures for Implementing NEPA (Corps).* (Includes Review and Consultation Requirements for Applicable Environmental Laws)
- ER 1105-2-50. *Planning, Environmental Resources (Corps)*
  - Ch 2. Fish and Wildlife Considerations
  - Ch 3. Historic Preservation
  - Ch 4. Water Quality
- 40 CFR PARTS 1500-1508. *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.* (CEQ)
- 40 CFR PART 230. *Guidelines for Specification of Disposal Sites for Dredged or Fill Material.* (EPA)

- 33 CFR PARTS 209, 335, 336, 337 AND 338. *Final Rule for Federal Projects Involving the Disposal of Dredged Material into Waters of the U.S. or Ocean Waters* (Corps)
- 40 CFR PARTS 220-229. *Environmental Protection Agency Ocean Dumping Regulations and Criteria.* (EPA) (These regulations implement MPRSA, 1972.
- 36 CFR PART 800. *Advisory Council on Historic Preservation, Protection of Historic Properties.* (ACHP)
- 32 CFR PART 229. *Dept. of Defense, Archaeological Resources Protection Act of 1979, Final Uniform Regulations* (DOD)

Conclusion

The Corps of Engineers has a Technician Assistance Program under which the Corps can provide technical advice on specific problems. For more specific information on any of the topics of this paper, readers are encouraged to contact the appropriate District Office of the U.S. Army Corps of Engineers.

Marina Hydraulics

*Ronald E. Nece**

Introduction

Problems to be addressed in the hydraulic engineering design of marinas on salt water can be grouped into three major categories:

- Providing wave protection in the marina for boats and berthing facilities;
- Providing stability and maintenance of navigation entrances;
- Achieving tide-driven water circulation in the marina that will minimize or eliminate potential water quality problems

All of these factors must be taken into account in designing the planform shape of the marina. Some concerns in each of these three areas will be discussed briefly. The first two categories are very likely those of most concern to users of the marina, addressing questions of adequately sheltered moorings and the ability of boats to enter or leave the marina essentially at will and not be dependent upon tide stage. The third category is of special importance in the Pacific Northwest because of concern about the impact of water quality in the marina upon the safe passage of salmon (both juvenile and adult) as they migrate past or through the marina. The provision of adequate tidal circulation and flushing is an important consideration, not just on environmental grounds, but also in the process of obtaining approval from regulatory agencies for a proposed project. The question of tidal flushing is a driving factor in the hydraulic design of marinas in the Pacific Northwest.

Wave Protection

The type and extent of constructed wave protection works depend upon the local wave climate, upon whether the marina is constructed in the foreshore or backshore, and upon the planform of the marina basin.

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*Professor of Civil Engineering, University of Washington

The wave climate at the site depends upon regional wind characteristics (speed, duration, and direction), fetch distances over which winds can blow in particular directions, and beach profiles that might lead to wave shoaling and refraction. The determination of the design wave(s) at the site is the necessary first step in not only sizing and designing the wave protection facilities but also in laying out the planform shape of the marina.

Breakwater design is governed by other than purely hydraulic considerations. The Washington State Department of Fisheries guidelines prohibit the construction of continuous, shore-attached structures beyond mean lower low water[1]. This criterion, intended to prevent migrating juvenile salmon from being forced into deep water where they are prey for larger predators, effectively specifies that detached breakwaters are called for in foreshore marinas. Rubblemound breakwaters are common, dependent on water depth and bottom conditions. Timber pile breakwaters are a common alternative, but their use is restricted if wave forces caused by design waves become too large.

Two problems associated with stopping wave energy from passing through navigation entrances and into the marina should be mentioned. If the marina is located in the backshore and may have an offshore breakwater providing wave protection for an entrance excavated across the original beach, a spending beach inside the entrance mouth may be used to absorb wave energy of diffracted waves which might arrive behind the breakwater. An example of this application is at the Point Roberts Marina[2]. In marinas where the navigation entrances are located between breakwater ends in deep water, timber pile 'spur' breakwaters built onto and extending from the typical rubblemound breakwater(s) and toward the marina basin interior can be located inside the entrance; these should be aligned so that they reflect waves against the inside face of the rubblemound breakwater and not into the marina basin.

Floating breakwaters, if considered as alternatives to more conventional fixed structures, should be used only with great care. In semiprotected waters of Washington, British Columbia, and Alaska, experience over the past 10 years shows that satisfactory wave attenuation perfor-

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[1]Washington State Department of Fisheries, "Criteria Governing the Design of Bulkheads, Land Fills, and Marinas in Puget Sound, Hood Canal, and Strait of Juan de Fuca for Protection of Fish and Shellfish Resources", Olympia, Washington, Adopted February 5, 1971.

[2]Layton, J.A., "Design and Construction of a Curvilinear Marina", Proceedings of the Specialty Conference on Coastal Structures 79, ASCE, Alexandria, Virginia, March 1979, 588-609.

mance is obtained with concrete pontoon units of width from 14 to 21 feet and maximum draft of less than 5 feet when exposed to waves of height 3 to 3.5 feet and periods up to slightly over 3 seconds; transmitted waves past these breakwaters are generally an acceptable one foot or less[3].

Navigation Entrances

Two considerations in the design of a navigation entrance are that it does not shoal due to sediment deposition, hence possibly requiring maintenance dredging, and that currents through the entrance do not pose safety problems for the navigation of small boats.

The process and rates of movement, settlement, and accretion of marine sediments depend upon the properties of the sediments themselves and upon the strength and duration of the driving forces of waves and tides. Littoral and longshore drift studies, therefore, are typically part of the required background work prior to actual design; any net longshore transport of sediment at the site should be identified. If navigation entrances, as well as fish bypass entrances at the shore, cause moving sediment to move into the calmer waters of the marina basin, then dredging may be required to maintain proper depths within the marina. Another aspect of this problem that should not be overlooked is that the marina can act as a trap in the longshore sediment transport process; if the net "downdrift" transport is reduced, then the shoreline downdrift of the marina may experience erosion. Mitigative measures may be required.

Navigation entrances must be wide enough so that currents on the tide flood and ebb are not strong enough to hinder navigation. Placement of interior breakwaters near navigation entrances should be checked to see that they do not cause any strong local cross-currents that could pose problems for unwary boaters.

Circulation and Flushing

Although definitive, quantitative links between tidal flushing of marinas and their water quality so far as fisheries questions are concerned have not been established, it is generally accepted that good tidal flushing is a required element in a proposed design[4]. Flushing can be considered from

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[3]Nece, R.E., Nelson, E.E., and Bishop, C.T., "Some North American Experiences with Floating Breakwaters", Proceedings of the Conference Breakwaters '88, Institution of Civil Engineers, Eastbourne, U.K., May, 1988, in press.

[4]Cardwell, R.D., Nece, R.E., and Richey, E.P., "Fish, Flushing, and Water Quality: Their Roles in Marina Design", in Coastal Zone '80, Proceedings of the Second Symposium on Coastal and Ocean Management, ASCE, Hollywood, Florida, November 1980, 84-103.

two approaches: overall or average for the entire marina basin, and local - i.e., might there be "hot spots" where effective flushing due to tidal action is poor and local zones of poor water can occur.

One fact should not be forgotten. The quality of water in a marina cannot be better than that of the water adjacent to where the marina is located, so the best marina flushing performance can only result in water quality in the marina comparable to that of the ambient water.

One parameter for quantifying the exchange of water within a marina with ambient water due to tidal flushing is an "exchange coefficient." The per-cycle exchange coefficient, designated as E in this paper, indicates the fraction of water in a basin or a segment of the basin that is removed (flushed out) and replaced by ambient water over the one tide period, selected here as the time from low water to the following low water.

A first-order prediction of the overall exchange coefficient $\bar{E}$ is to equate it to the tidal prism ratio (TPR). This approach assumes that the water in the marina at low water level is thoroughly mixed with the ambient water that enters the marina on the flood tide. The TPR can be defined as:

$$TPR = \frac{\text{(Marina Basin Volume at High Tide) - (Volume at Low Tide)}}{\text{Basin Volume at High Tide}}$$

where the numerator is known as the "tidal prism." The TPR is a reasonable first estimate of the flushing capability of a marina that has a well-defined entrance, communicates directly with ambient waters, and has no significant freshwater inflow. Comparison of the actual exchange versus the TPR provides an index of the flushing efficiency of a marina.

The tidal circulation patterns in a marina can be very complex, and are highly dependent on the basin planform. Predictions of flushing (exchange coefficients) to date have been based almost entirely upon results of physical model tests conducted in laboratory tide tanks. Numerical models have not yet progressed to the state where they can handle flow field and diffusion calculations in marinas other than those having essentially level bottoms and very simple planforms; physical hydraulic models must be used if details of the internal hydraulics are sought.

The examples in this paper show results from small-scale model tests conducted at the University of Washington. These results and the testing

methods used have been given in more detail elsewhere[5,6]; they are discussed briefly here to illustrate some influences of planform shape on circulation and flushing.

POINT ROBERTS MARINA

Point Roberts Marina has a rather elliptical planform with a surface area of 40 acres, a single narrow entrance, and an essentially horizontal bottom at

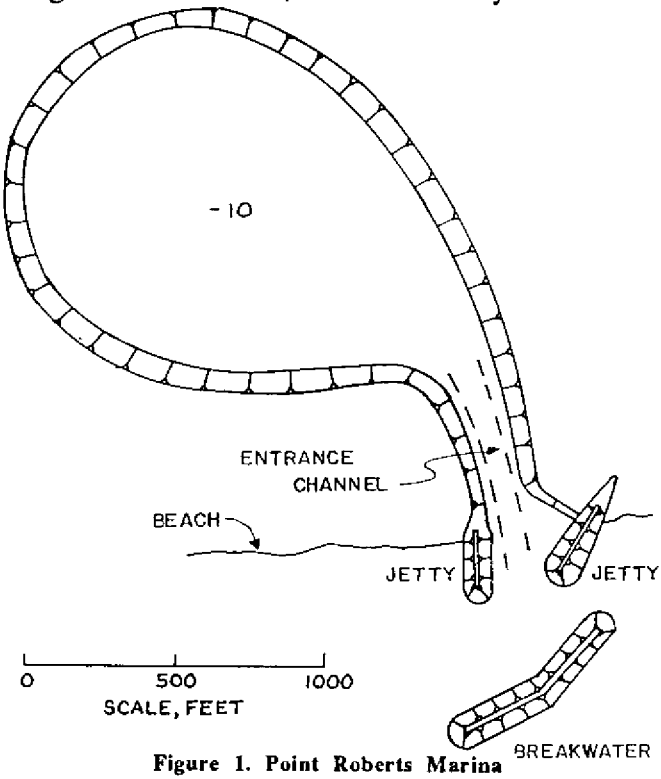

Figure 1. Point Roberts Marina

depth -10 feet (MLLW datum); mean water level is +5.6 feet. The asymmetric entrance aligned with one boundary of the basin optimizes interior circulation; the incoming tide produces a jet that possesses sufficient momentum to create a single large-scale counterclockwise circulation cell, or

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[5]Nece, R.E., Smith, N.H., and Richey, E.P., "Tidal Circulation and Flushing in Five Western Washington Marinas", C.W. Harris Hydraulics Laboratory Technical Report No. 63, University of Washington, Seattle, Washington, June 1980.

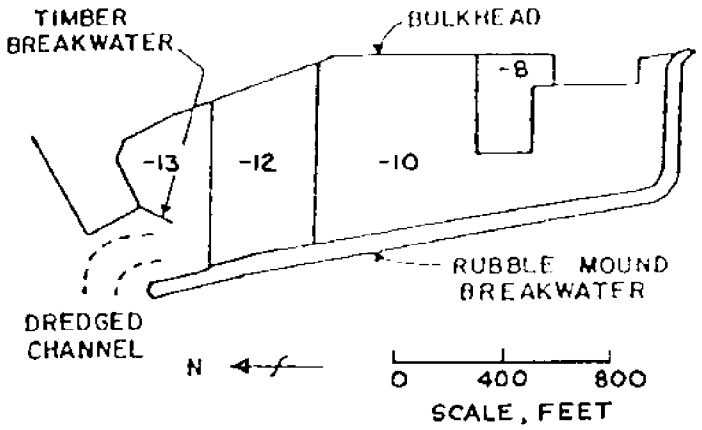
[6]Nece, R.E., "Physical Modeling of Tidal Exchange in Small-Boat Harbors", Proceedings Conference on Numerical and Hydraulic Modelling of Ports and Harbours, BHRA, Birmingham, England, April 1985, 33-41.

gyre, which sweeps throughout the entire basin for all flood tide ranges. As shown in Figure 1, there is a detached breakwater off the entrance. Longshore currents exist at the site and change during the tidal cycle. Flushing tests, using a tracer dye, were run with induced unidirectional longshore currents, and with no induced currents; the flow reversal could not be fully simulated. The marina "basin" area for which the overall spatial average exchange coefficient was determined included most of the entrance channel as well as the inner basin. For a 5.9-foot tide range, the following results were obtained: No longshore current, $\bar{E} = 0.22$; strong west-to-east longshore current, $\bar{E} = 0.31$.

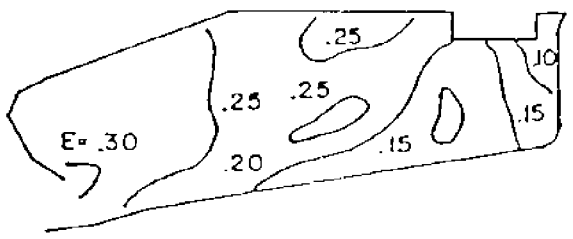
These numbers represent the most conservative and best flushing scenarios, respectively, and bracket anticipated prototype behavior. Compared to the corresponding value of TPR = 0.34, they seem low in contrast to the excellent interior circulation. The results were influenced strongly by the detached breakwater, which on the ebb tide impeded direct discharge of water exhausted from the marina; some of this water returned to the basin on the following flood tide, decreasing the effective water exchange. Field observations have verified the good hydraulic performance of the marina; quality of the water which exchanges with the Strait of Georgia, is good.

DES MOINES MARINA

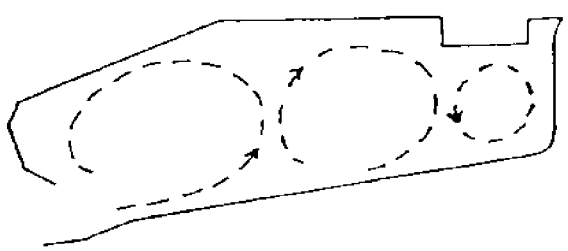
Des Moines Marina, shown in Fig. 2, is basically rectangular in planform, has a single well-defined entrance, and a surface area of 23 acres. Strong reversing longshore currents exist off the marina. Depths shown in Figure 2-a are referred to MLLW; mean tide level is +6.8 feet. Figure 2-b shows "contour" lines of local exchange coefficients E for a 6-foot tide range. Flow patterns in the basin are complex; the three-gyre pattern shown schematically in Figure 2-c develops on the flood. The basic circulation pattern observed in the model was confirmed by field measurements. Exchange with ambient water in the innermost and weakest gyre is poor. At high water slack, all of the "new" ambient water is within the basin; whereas between high water and low water, much of this new water has circulated around the outermost gyre without full mixing and has been exhausted from the basin.



(a)



(b)

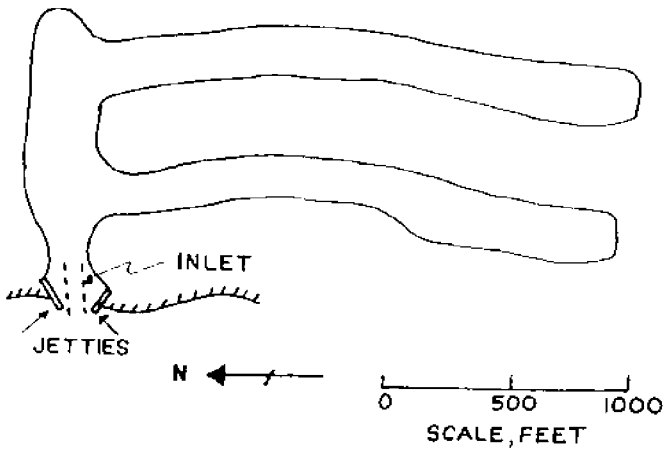


(c)

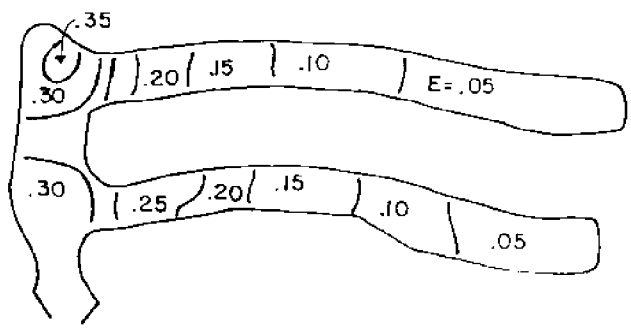
Figure 2. Des Moines Marina

LAGOON POINT MARINA

Lagoon Point Marina (Fig. 3) is a residential, canal-type marina with two long channels dredged from a marshland and connected to ambient waters by a short header channel. It has a total surface area of 20 acres, nominal depths to -10 feet (MLLW), and a mean tide level of +4.9 feet. Strong longshore currents exist off the entrance; the small entrance between the



(a)



(b)

Figure 3. Lagoon Point Marina

jetties leads to fast inflow currents into the header channel. Contour lines of local exchange E for a 6-foot tide range are shown in Figure 3-b. Almost all the circulatory tidal flow occurs in the header channel; flows in the two canals are more one-dimensional. Local effective exchanges approached zero at the closed ends of the canals in the unstratified, no-wind laboratory tests.

ELLIOTT BAY MARINA

The proposed Elliott Bay Marina is shown in Fig. 4. The primary feature of the design is the multiple opening layout with two navigation openings (one at either end of the detached rubblemound breakwater) and two fish openings (one at the inshore end of each of the two timber-pile breakwaters). Other differences from the marinas described above are the large

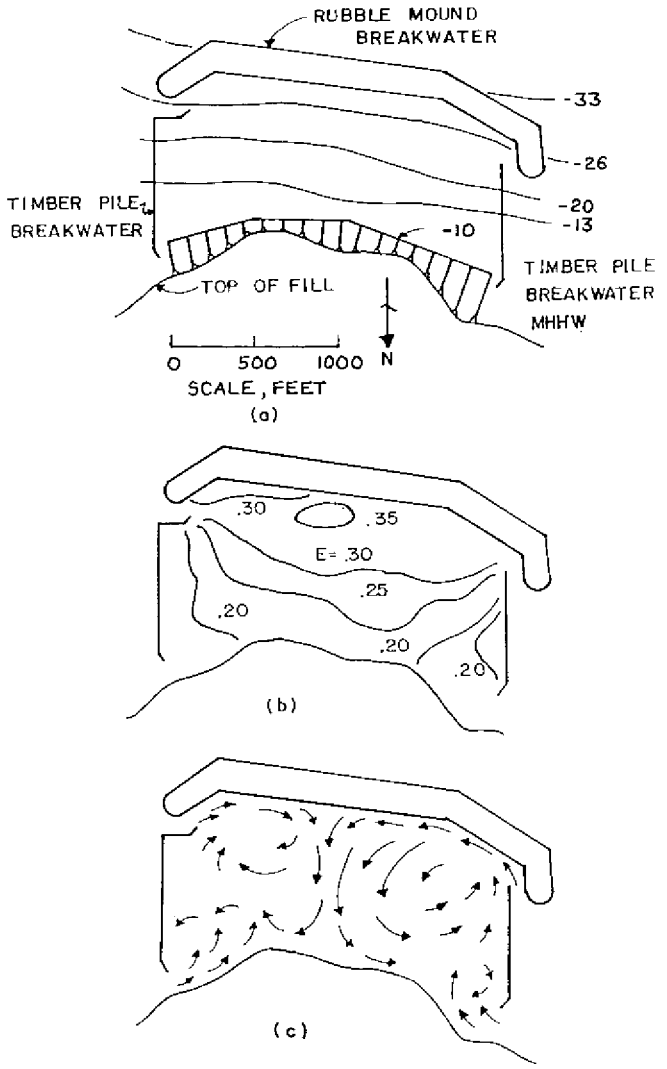


Figure 4. Elliott Bay Marina

water depth inside the breakwaters and the small amount of dredging required to obtain design depth in the boat basin. The surface area is 50 acres, mean tide level is +6.6 feet, and longshore currents at the site are weak. The local exchange coefficients E in Figure 4-b were obtained for a 7.6-foot tide range. The flow pattern on the flood tide, between mean water level and high water, is shown schematically in Figure 4-c. The basin flushes best in deeper water, and lowest flushing in terms of E as defined in this paper occurs near the fish entrances. The apparent low E values near the fish entrances are rather misleading, however, as during part of the cycle these regions are mostly occupied by ambient water that enters on the flood tide. On the whole, the basin exchanges and mixes quite well.

The Elliott Bay Marina configuration shown in Figure 4-a was a slightly modified version of an initial design, which produced an $\overline{E}$ value of 0.25 when tested at the 7.6-foot tide range. The initial design was also tested, for comparison purposes, at the 7.6-foot tide range and with the two fish openings closed off by temporary dams; $\overline{E}$ was 0.30. The improved flushing was a consequence of having two large gyres in the basin; these gyres were stronger than when the shore (fish) entrances were open because inflow volume requirements increased the momentum in the inflow through the navigation entrances. These results, which have been substantiated by comparable tests on other planforms not discussed here, indicate that more openings do not necessarily guarantee better flushing.

Conclusion

These few examples have sampled the wide range of planform geometries that are possible, and indicate that interior flow patterns are often complex. Likely circulation patterns should also be considered in the location of fuel docks and holding tank pump-out facilities. It should be noted that the model studies were run with no attempt to simulate boats or floating structures, but these have little or no effect on tidal circulation patterns; their impact is noted in the disposition of surface floatables. So far as the question of tidal flushing is concerned, the compilation of information from model studies conducted on a wide range of marina planform geometries provides rational guidelines for design.

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Electrolysis and Shore Power Systems:
The Hot Dock Syndrome

*Ted Swartz**

No other area of concern to vessel operators and owners is subjected to more hearsay, misinformation and, in some cases, outright mysticism than that which is expressed by the chilling word: electrolysis.

This phenomenon, which terrorizes boat owners, operators, and maintenance personnel alike, manifests itself in the eroding or rotting away of a vessel's underwater metal structures in an apparently random and often mysterious fashion. There is no clear consensus among the boating public as to the source of this phenomenon. This assertion may easily be checked out by asking several people who are familiar with boating — particularly in the marine environment — for an explanation of the cause or causes of electrolysis. There will likely be as many different explanations as people asked.

I encountered one such explanation several years ago on a dock in a Southern California marina. When I asked the specific question "What causes electrolysis?" the respondent pondered for a moment or so. Then he offered the following answer: "Bugs!" With obvious seriousness, he stated that "Electrolysis bugs swim through the water in giant swarms" like microscopic metal-eating piranha looking for tasty metals to consume. If a particular boat is unlucky enough to be encountered by such a swarm, it's too bad for its propellers — or shafts, or rudders, or whichever metal structure seems most tasty that day.

A logical extension of this notion from the cause of electrolysis to its prevention is what I like to call the "sweeter meat" theory of corrosion control. If electrolysis bugs cause corrosion and these bugs have preferences for one metal over another, it stands to reason that we need only to offer a metal that is always preferred. The swarms will dine on this and not attack the more important metal structures of our boat. It would be a sort of metallic sacrificial lamb, so to speak. This is one way to put the word "sacrificial" into the term "sacrificial anode."

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Obviously, the way to assure protection for our boat is to hang a curtain of these tasty metal morsels around it (I have seen such zinc curtains on several occasions). Then, regardless of which direction the electrolysis *insecti* approach, they will encounter the "sweeter meat" and stop to dine. One can only hope the swarm is not too big or the meal too small.

That such an explanation for corrosive attack can be seriously offered, along with others I frequently encounter which are based on notions that are equally unfounded, is testimony to the general perception among the boating public that there is little or no solid, scientific knowledge concerning the causes and prevention of metallic corrosion.

The Problem with Electrolysis

One of the problems is the use of the word "electrolysis" itself. There are two difficulties with the way this word is used in our industry. First, in a strictly technical sense, electrolysis is not a term that refers to the process of metal dissolution or destruction. Electrolysis refers specifically to the process that results in a chemical change to an electrically conductive solution when an electrical current is passed through it. Electrolysis concerns itself with changes to the liquid (solution), but not to changes in the metal in it. Second, the use of a single word, particularly a word that is poorly or not clearly defined, to describe phenomena which by their very nature are complex, results in understandable confusion.

A frequent expression of frustration heard in marinas everywhere is "Nobody really knows what causes electrolysis." Compare this lament to the fact that a large body of reasonably well-organized scientific and engineering information has been developed over the past one hundred fifty years concerning the causes and prevention of electrochemical corrosion attack. Corrosion testing and research have been done for metallic structures in the ocean, in fresh waters, in the soil, and in the atmosphere. In other industries, such as petrochemicals, utilities, communications and manufacturing, this information is increasingly being recognized and utilized to reduce the cost and danger of corrosion failure to metal structures. So the problem is electrochemical corrosion, not electrolysis, and indeed, there is considerable knowledge available as to its causes and prevention.

Why Be Concerned?

From the point of view of the marina operator, harbormaster or port manager this problem, at first glance, would seem to be of only incidental interest. That is, it is mainly not the marina and harbor facilities that are experiencing corrosion attack, but rather the vessels moored at these facilities. So why should you be concerned about a problem that has only minor potential for direct impact on the maintenance and operation of your

facility? Because, as many of you are painfully aware, we are troubled not only by those events that affect us directly in life, but also by those for which we can be blamed.

And port facilities and marinas are frequently blamed by individuals mooring vessels at these facilities for the corrosion attack to their boats. The concept of the "hot dock" or "hot marina" is all too familiar. This notion that the the moorage facility itself is the source of the corrosive attack to the vessels moored therein is, with very rare exception, as invalid as our imaginary electrolysis "bugs" munching on metal.

However, there is a problem! And this problem is linked to one particular feature of most moorage facilities — the AC electrical distribution system that is an integral part of most marinas and port facilities. To understand how this system can be a factor in corrosion attack to the vessels being served by it, we must first briefly look at some corrosion basics.

Corrosion Basics

The problems commonly referred to by the term *electrolysis* are all electrochemical in nature and, relative to boats and ships, require the following conditions to occur:

- The presence of liquid water — usually complete submersion in water
- An electronically conductive pathway between the metal objects involved
- A source for a voltage to drive electrical current

There are two basic types of electrochemical corrosion attack driven by two different motive forces: *galvanic attack* and *stray current attack.*

GALVANIC ATTACK

Galvanic attack is energized by the natural voltage differences between metals of different compositions when they are wetted by or immersed in an electrically conductive solution and are electrically connected together through a low resistance electronic pathway. Such an arrangement is known as an *electrochemical corrosion cell.* When the conductive solution is sea water, the driving voltage is the difference in each metal's natural voltage in that environment. This voltage can be thought of as the pressure or force that moves electrical current between the active elements in a corrosion cell. Typically, the driving voltage of a galvanic corrosion cell can be as little as twenty to thirty millivolts to as much as 900 to 1000 millivolts. The severity of corrosion attack over time is determined by a combination of the cell's driving voltage and the amount of current that is flowing between the metals.

The metal that is damaged in such a corrosion cell is the one which has the more negative natural solution voltage. Severity of attack to the corroding (anodic) metal structure increases as the effective wetted surface area of the non-corroding (cathodic) metal structure increases.

The use of different types of metals in modern vessel construction is virtually unavoidable. Design, construction, performance, and economic considerations dictate that there will be galvanic differences not only between the underwater metal structures on different boats, but also between various metal structures on the same boat. The combination of these factors with some others we will be looking at shortly dictates that galvanic corrosion is, by far, the most predominant form of corrosion attack.

STRAY CURRENT ATTACK

In contrast to galvanic corrosion, stray current corrosion gets its driving force from some electrical power source such as the boat's batteries, AC or DC generator, or the AC shore power system. Stray current corrosion attack is always the result of the development of an electrical *fault circuit* in some electrical power circuit or device.

A *fault circuit* results whenever electrical current flows outside the circuits or devices served by them through unintended pathways. Fault circuits typically result from damage to a boat's wiring or an electrical device that results in either a partial or complete short circuit. More rarely, a fault circuit may occur because of improper electrical design or improper electrical installation. For corrosion to occur, the fault circuit must energize at least two different underwater metal structures or areas, either on the underwater hull of a single vessel or on two or more vessels that are linked together by a common electrical conductor. Whereas the driving voltage for galvanic corrosion is typically measured in millivolts, stray current corrosion cells commonly have driving voltages of many volts, with correspondingly high current flows. The resulting stray current corrosion generally causes severe damage over a relatively short time span. However, because of the relatively high electrical resistivity of water, even sea water, stray current corrosion is the more rare type of attack to boats. The integrity of the electrical circuits aboard most boats is sufficient to keep the electrical current flowing through the normal metallic electrical pathways.

If all vessels were moored independently, with each boat's underwater metal structures electrically isolated from those on all other boats, virtually all corrosion problems that could possibly occur on a particular boat would be dictated by the galvanic and electrical conditions on that vessel only. However, the practice followed today of grouping vessels in common moorage, such as at piers or marinas, and supplying these vessels

with electrical power from a common electrical distribution system has made the corrosion relationships between them much more complex.

AC Shore Power Systems and Corrosion

Whether or not there are electrical faults in the shore power delivery system (anything short of bare or leaking electrical conductors in the water), protection of a vessel against inter-boat corrosion attack requires proper design, installation, and maintenance of the boat's own AC electrical system.

The AC shoreline delivery system that typically is expected to deliver 110 volt or 220 volt AC power to drive onboard AC electrical equipment while the vessel is at dock frequently delivers something extra. The common practice by boat builders today of electrically interlinking the AC safety ground conductor of the shore power system to the vessel's underwater metal structure guarantees that corrosion cells will frequently be established which involve more than one vessel.

When one considers the number of vessels that may be served by a common AC delivery system, the possible combinations of grossly incompatible underwater metal structures that may be electrically linked together via the safety ground conductor (forming widespread, complex galvanic corrosion cells), and the everpresent danger of an electrical fault circuit occurring on a vessel connected into the system, it's small wonder that the "hot dock" notion is so widespread. The fact is, however, that the dock or pier is not at fault.

The significance of the connection between a boat's underwater metals and the AC shoreline safety ground conductor is threefold. First, if a voltage drop exists in this conductor, electrical current will flow either into or out of the water via the connected metal parts. In either case, damage may occur to the vessel's structure. A voltage drop in the dock safety ground conductor indicates that electrical current is flowing in this conductor and that any boat that has its underwater metal fittings connected to the dock safety ground conductor via its own electrical system is subject to the flow of electrical and, therefore, corrosion currents.

Existence of electrical current flow in the marina AC safety ground system is to be expected, particularly on those docks where larger boats are being moored. Larger boats typically use significant amounts of electrical current to power onboard systems such as lights, water heaters, space heaters, air conditioners, and water circulation systems. The electrical current supplied by the "hot" conductor in the dock AC system is supposed to be returned by the "neutral" conductor. The AC "safety ground" conductor is provided to bleed off any leakage current from an AC device to prevent human exposure to dangerous AC electrical voltages

that may appear on the nonelectrical parts of such a device. Because of the many unavoidable interconnections between the AC neutral and safety ground systems in a marina, some of the return current will nearly always flow through the safety ground system.

Second, the metals so connected are subject to severe corrosive attack should a major electrical failure occur aboard the boat or a neighboring boat that has its underwater metals electrically connected to the dock AC safety ground system. In this second condition, a loop circuit is formed between two or more boats. The safety ground conductor acts as a current pathway for one side of the circuit and the water the boats are moored in acts as the other side. These electrical currents may have no more effect than to increase the rate of sacrificial anode consumption on those vessels influenced by them. However, the potential for severe corrosion damage exists to boats so exposed.

Third, should two (or more) vessels have underwater fittings made of galvanically incompatible metals and these metals are electrically connected through a common AC safety ground conductor, moderate to severe corrosion damage will occur to the fittings that are made of a more reactive (less noble) metal. An example of this phenomenon would be to have aluminum alloy stern drives on one boat connected electrically through the shore power system to the bronze and stainless steel propellers, shafts, struts, and rudders on another nearby vessel. A galvanic corrosion cell is formed between the aluminum structures (less noble) and the bronze and stainless steel structures (more noble), resulting in damage to the aluminum parts of the drives.

Though several organizations, such as the American Boat and Yacht Council, recommend connecting the AC safety ground aboard small vessels to both the dock safety grounding system and the boat's own underwater metals, the owners of these vessels should be aware of the significant corrosion hazard that results from following this practice. They should also be aware that nearly all boats being produced and/or sold in this country are wired according to these recommendations. These recommendations are designed to prevent electrocution to humans, but do not consider the corrosion hazard to the boat itself.

Technical Solutions

There are several solutions to the problem of exposure of a boat's underwater metals to influence by electrical currents passing through the AC shoreline distribution system. The most acceptable is the installation of a properly sized AC isolation transformer aboard the vessel.

ON-BOARD ISOLATION TRANSFORMER

This transformer should be installed as the first device downstream of the AC shoreline receptacle, ahead of the ship to shore switch and the electrical distribution (circuit breaker) panel. The transformer should be installed on an electrically isolated mounting with the AC shoreline safety ground conductor connected to the metal housing of the transformer. The shoreline safety ground conductor should not be connected to any onboard AC device that is being supplied power from the secondary side of the transformer and/or to the underwater metal structures of the vessel. Use of a properly designed and installed isolation transformer electronically isolates the electrical power being used aboard the boat from that supplied by the shoreline. This will effectively prevent corrosion currents from using the shoreline as a conductive pathway between the boat with the device and any other vessel using the same dock power system.

GALVANIC ISOLATOR

Another solution, though not quite as effective as a transformer, is to install a galvanic isolator in the AC shoreline ground conductor between the boat's receptacle and the first AC device, such as a ship to shore switch or distribution panel. This device allows AC current to pass unimpeded while blocking low level (galvanic) DC currents. Mercury Marine's Quicksilver galvanic isolator is the only one I know of that is Underwriters Laboratories approved and listed. A galvanic isolator will block approximately eighty-five percent of the potential problems that occur due to safety ground interconnection between boats.

If a vessel uses any amount of AC electrical power supplied through a shoreline, one of the devices just described should be installed. There should be no direct (low resistance) connection between any of the AC shoreline conductors and a vessel's underwater metal structures. Proper installation of an isolation transformer or a galvanic isolator is essential for the device to be effective. Whichever device is chosen, one should be certain that the specific model to be installed is rated for the anticipated electrical current load and that it has Underwriters Laboratories approval.

The Best Solution: Boater Education

Since the problems we have been discussing occur primarily to your tenants' property and not yours, what is the best action to take? Certainly you have no direct control over the factors leading to corrosive attack to their vessels. What you can do is educate.

When boat owners or operators indicate that electrolysis is occurring, direct them to a person who is knowledgeable about causes and prevention — or, provide them with written information on the subject, such as a

copy of this discussion. Suggest to these individuals that positive steps can be taken to prevent attack to their boats.

Write the American Boat and Yacht Council and the National Fire Protection Association expressing your concern. As mentioned earlier, both of these organizations have issued recommended practices for AC wiring aboard boats that call for the interconnection of the AC safety ground conductor from the shoreline to the boat's underwater metals. Both do indicate that an isolation transformer or a galvanic isolator may be installed, but neither requires these devices.

The standards and practices recommended by these two organizations are relied upon by most boat manufacturers for guidelines to AC electrical system design and installation. While the concern reflected in their recommendations for human safety is laudable, little recognition is given to the danger and economic cost of corrosive attack to a vessel's metals because of the interconnection between these metals and the AC shoreline safety ground conductor. Encourage your tenant vessel owners — especially those who have suffered corrosion losses — to also write. Such communications may, in time, serve to focus attention on the problem, which in turn might lead to changes in the recommended standards and practices published by these organizations. Hopefully these changes will take into consideration the safety of the vessel itself as-well-as the safety of the people aboard it.

American Boat and Yacht Council
P. O. Box 747
405 Headquarters Dr., Suite 3
Millersville, MD 21108

National Fire Protection Association
Batterymarch Park
Quincy, MA 02269

Professionalism in Marina Management: Towards an Operations Manual

Tourism and Guest Moorage Management

*Douglas Ensley**

The title of this workshop is "Tourism and Guest Moorage Management." Are they the same? Yes, they are the same.

In 1983, when I was hired as Harbormaster for the City of Ketchikan, I was given two hats. One hat was as Port Director, the other hat was as Harbormaster. Each day when I went to work I made sure I had both hats at the ready so that I could respond to the needs of the department.

As Port Director, I am responsible for the Port of Ketchikan and the Port's Enterprise Fund. The Port presently consists of three docks totaling 1,400 linear feet and two floats used by tourship lighters and other vessels. The Port serves the tourship, fishing, and freight industries and enjoys the benefits of growth in each of the industries. In 1983, the port accommodated 147 tourship calls. In 1988, the tourship industry made 327 landings. Fishing vessels that work the area of southeast Alaska, Gulf of Alaska, and Bering Sea are also frequent users of the Port. Many barge lines use the Port to make repairs or adjustments to their cargoes when they've encountered heavy weather.

Tourists travel by car, rail, bus, airplane, and ship. Some bicycle or hitchhike. Ketchikan's tourists arrive by airplane or by ship. In 1988, between May 9th and September 30th, 173,159 tourists and an uncounted number of crew members crossed the Port of Ketchikan. This may be an insignificant number to a city like Seattle, but for Ketchikan and other Alaskan communities, those visitors represent our third largest industry. Tourism is a clean industry. Tourists or visitors come to town, clog the streets, take bus tours, visit the shops, museums, and restaurants, and leave. Sounds like this conference in a way, doesn't it? The tourships have two basic needs: clean, safe docking facilities and good potable water. Those are the basic needs. The tour industry also needs adequate apron space for accommodating gangways, ground transportation, support services, etc., but the basic needs are still a good docking facility and water.

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* Director, Port & Harbors Department, City of Ketchikan

As Harbormaster I am responsible for five state-owned small boat harbors which are leased to the City of Ketchikan to operate and maintain. The harbors are public facilities and I am only a steward. State law, state regulation, the state lease, and the Ketchikan Municipal Code provide the direction for operating the harbors and administering the harbor revenue fund.

Ketchikan's harbors are no different from yours--well maybe that's not true, our harbors are wet on top as well as the bottom. We serve pleasure, commercial, and public vessels. Sailboat or seiner, resident or non-resident, rich or poor, if they request moorage, we do our best to provide that moorage. We have never turned a vessel away.

Ketchikan has a total of 1,073 reserved stalls and 4,000 linear feet of open moorage space. Compared to harbors like Everett, Shilshole, and others in the area, our operation is small, but our problems are the same.

I began by describing our port operations and you've probably asked yourself: How does this relate to guest moorage management? The relationship is in the basic need of any vessel, be it a tourship or a troller; they require a clean, safe mooring facility and they need good potable water. Yes, I know what you're thinking; guests, transient boats or whatever we call them, request more than just moorage and water, but we have to start somewhere and that start is the request for moorage and how we respond to the request for moorage. We must also keep in mind that those vessels are guests or tourists and their contact with our harbors can leave a lasting impression and have an effect on our communities' tourism efforts.

Our harbors have two types of harbor users. First we have the reserved stall holder. This is an individual or company who pays for the opportunity to have a space available for their boat. They pay an annual or, in some areas, a semi-annual fee. Now remember I said that in Alaska the state owns the harbor; therefore, there are no property rights. Under the state scenario, stall holders pay a user fee, not rent, and are able to use their stall when their boat is in the harbor. When the stall holder's boat is not in the harbor, we have the right to utilize that stall. Your harbor may be regulated differently.

The other type of harbor users are the individuals who are not reserved stall holders. We call them transients, guests, fishermen, yachtees, etc. They are residents of our communities who are waiting for a reserved stall; they are fishing vessels engaged in a fishery or they are a pleasure (or commercial) vessel that is visiting the area and needs a place to moor. By our municipal code, we are required to provide, as best we can, moorage on a first-come, first-served basis.

The majority of the vessels that arrive at our harbors are repeat visitors who are familiar with Ketchikan's harbor system. Others make con-

tact by VHF radio with a request for direction to moorage. Let's take a typical radio call from a visiting or transient vessel. "Ketchikan Harbormaster, this is *Sandra K*, WRU3467 requesting moorage." Our typical response is "*Sandra K*, this is Ketchikan Port Authority, WHG950. What is your vessel length and how many days moorage do you need?" How does any harbor manager know if he can accommodate such a request for moorage? That is the purpose of this workshop.

We all know how many stalls we have; we know which stalls are reserved; we know how much guest moorage space we have, but do we know that space is available? Of course we do or at least we think we do. We must manage our facilities in a manner that allows us to utilize every available space and maximize our revenue potential.

How do you manage space utilization? How many of you use foot patrols in your harbors? How many of you have a watch tower or television camera that overlooks the entire harbor? How many of you have a computer program that helps you monitor use of your harbors?

We rely quite heavily on the foot patrol. First hand, personal knowledge of what space is available in the transient areas is essential. It is also important to know what reserved stalls are not occupied. If your foot patrol are equipped with a multi-band radio, they can speak directly to a vessel requesting moorage and direct them to the available space. A watch tower would probably serve the same purpose as the foot patrol, but only in a small harbor. Now some of you may be asking yourself: How can a computer help provide moorage for the *Sandra K*. Let me describe our system and how it can be used to manage moorage better and possibly increase revenues. In Ketchikan we use a computer with a database program which contains our reserved moorage files. Each record within the file contains all the pertinent information on the stall and the stall holder. Two pieces of information on the record will help us determine if we can use an empty stall for transient moorage. The first is stall length. Now the foot patrol can easily tell if the *Sandra K* can fit the stall. It's the second piece of information that tells us how long the stall will be available.

Every vessel assigned a reserved stall is identified as to its use. Pleasure boats, trollers, gillnetters, charter boats, etc., are all identified by use. By knowing the boat's use and operating schedule for that type boat, we know when a boat is scheduled to leave the harbor, how long it will be gone, and the date the boat is expected to return. The benefit is that we can direct the *Sandra K* to moorage that will accommodate the boat's length and its length of stay. Some of you may have been using this system for years. I know it may sound like extra work to some of you, but once you've built your information network, the rest becomes daily routine. Our information network includes fisheries announcements, charter

boat schedules, and information provided by pleasure boat operators who radio our office with their anticipated date of return.

There is another benefit to this system, which most call "hot berthing" and that is the increase in revenue you receive by being able to use all of your available harbor space for guest moorage. I recognize that you may have state or municipal constraints that prohibit what could be perceived as double payment. If so, it may be worth the effort to do the research to determine if a change is possible. By increasing revenues, we can hold the overall cost of moorage to a minimal level and still meet our expenses.

Transient moorage accounts for approximately 28% of Ketchikan's annual moorage revenues. For the small harbor operator with one ramp and an office at the top, collection upon arrival is easy. In reality, we operate large or multi-harbor facilities where daily arrivals can be in the hundreds. It is almost impossible to meet or contact every vessel on arrival.

In Ketchikan we have many visitors who pay on arrival or register with us and pay on departure. When a vessel registers, the operator is given the option of being billed for their stay in the harbor. We also bill a number of fishing vessels that are frequent users of the harbors. Our billings are prepared and mailed by our department. I am pleased to note that payments are at a high level with uncollected revenues at 3% of total revenues. I am convinced that by using a professional approach, legible and consistent billings, and by pursuing all avenues of recovery of payments, you can reduce the number of uncollected accounts to an acceptable level.

All visiting vessels are tourists. They request services that not every one of us can provide. They also require information about our communities. Visitor information that is prominently displayed will reduce the number of questions. A circular that is written for the boater will provide answers to all the questions from: Where can I take a shower? to, Where is a bank? One thing you should keep in mind is that you don't need to bear the cost of this information service. Your visitors bureau or tourism council and other local groups can provide the information.

I began this presentation by giving you statistics on our tourism activity at the port. It is possible to review your guest moorage activity and develop a reasonably accurate statistic on visitors to your community who arrive at your harbors. During the period of May 1 to August 30, Ketchikan recorded 1,745 visiting vessels in our harbors. These vessels were both commercial and private which, we estimate, carried 6,107.5 visitors to the community. This may appear an insignificant number compared to the overall impact of tourism on any community, but they were our guests and it is our responsibility as representatives of our communities to treat them as guests and to provide a reasonable level of service.

I didn't come to Everett to tell you how to run your harbor. I came to learn, to hear your ideas, your problems and to pick your brain for solutions to my problems. We have all heard a transient boater tell us how the other harbors do it; now let's set the record straight, which one of you is paying boaters to moor in your harbor?

SERVICE	COST
• Fee Collection Systems	..... ?
• Temporary Electricity/Telephone	..... ?
• Restrooms	..... ?
• Showers	..... ?
• Laundry	..... ?
• Solid Waste Collection	..... ?
• Waste Oil Collection	..... ?
• Security	..... ?
• Visitor Information	..... ?
• Message Service	..... ?
• Live-aboards	..... ?
• Emergency Repairs	..... ?

Harbor Amenities for Transient Vessels

What are *your* costs for the above services and are you recovering your costs?

Liability and Risk Management

*Bill Yahn**

Marina facilities have unique exposures that are common only to the marine industry. How these exposures are treated may have significant impact on the overall success of a marina operation.

I would like to address four questions that are applicable to marina operators. Hopefully, by discussing and answering these questions, we will be able to provide the means to reduce your liability exposure via risk management techniques.

- *How can marina operators (public or private) minimize their risk exposure, and hence insurance costs, through their contractual relationships with their tenants and employees?*

It may be easiest to answer the question as it pertains to marina operators and their employees. In the United States, employers are regulated by the state in which they operate in respect to their liability/Workers' Compensation relationship with their employees. In some cases, workers may not be under state jurisdiction as their employment may require them to work on or adjacent to navigable waters of the United States. Coverage for such employees would be provided under the United States Longshoremen's and Harbor Workers' Compensation Act (USL&H Act) unless excluded by virtue of the employee working for an employer that happens to be a political subdivision of the state or federal government. In such cases, the employee would typically be compensated for worker injuries under the state compensation system.

This means that workers who are injured on the job are usually limited to the state compensation system or the federal system for recovery. Under either system, the amount of recovery is limited by law, and contractually there would not be much employers could do to minimize their risk exposure as it pertains to employees. Typically, if an employee is injured on the job, the employer's Workers Compensation Policy will respond regardless of fault.

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However, the marina operator/tenant relationship is outside of the compensation system, and there are things contractually that an operator can do to minimize his risk exposure. First of all, as the owner of property that a potential tenant desires to lease, you have a certain leverage in negotiating a lease contract. As the marina operator, you will be preparing the lease or moorage agreement that will ultimately have to be signed by your tenant. As such, you have the ability to state that the tenant shall hold you harmless for any injury or property damage that occurs on the property leased to the tenant.

This is reasonable as the owner of the property will relinquish some control of its use to the tenant and, as such, the tenant should be responsible for any liability arising out of his use of the property.

In addition, it is common practice for the lessor (marina operator) to require that a certain limit of liability insurance be maintained by the tenant. It is also common practice for the lessor to require the lessee (tenant) to name him as an additional insured so that a liability suit brought against both parties due to the tenant's operations would be defended and settled by the tenant's insurance company.

- *How can better maintenance and operating procedures reduce risk?*

Facilities maintenance can play a key role in preventing accidents that may lead to liability suits. By properly maintaining the walking surface on floating structures, the marina operator effectively minimizes the potential slip and fall type claim that can occur when walking surfaces are in poor condition. As a marina operator, you have a certain duty to provide facilities that are reasonably safe in consideration of the likely pedestrian traffic that is associated with such operations.

Operating procedures can also effectively minimize the potential for accidents by controlling who is allowed access to the facility and what operations tenants are permitted to perform.

Example: By not allowing a moorage tenant to conduct a "bed and breakfast" business at your marina, you will effectively eliminate the additional foot traffic (and additional potential risk) that would come with such an operation. However, the extent and type of operations a marina operator will allow on the premises will depend on the goals and objectives of the specific marina. When goals and objectives are being set, associated risk with potential operations should be considered.

- *Can an insurance broker/underwriter/specialist play a role during the design of a marina to minimize exposure?*

Yes. In many cases, the larger insurance broker will have a Risk Control Services Department with safety specialists available to comment on the

particular design of a marina. Also, a broker who specializes in writing marina policies will typically have a "feel" for the general marina exposures that contribute to increased claim activity and can advise accordingly.

- *What are the ten Do's and Don'ts you would advise a marina client to observe?*

The following ten Do's and Don't's were developed as a result of our experience with marinas and ports: —

DO'S	DON'TS
1. Do protect your marina with a signed moorage agreement.	1. Don't put your marina in position of warehouseman unless adequately compensated for risk.
2. Do post regulations for the use of marina facilities.	2. Don't admit liability in the event of an accident. Let investigation determine liability
3. Do implement an inspection program (docks, hoists, walkways, etc.).	3. Don't allow public to operate hoists.
4. Do establish contractual relationship with commercial tenant (Hold Harmless, your favor).	4. Don't allow commercial operators to use docks uncontrolled.
5. Do provide orientation to employees regarding the care of property of others.	5. Don't provide courtesy tools. If they break, you could be held liable for injury.
6. Do make areas off limits to the general public.	6. Don't allow any children on the docks.
7. Do utilize non-slip surface material on ramps and walkways.	7. Don't allow customers to pump gas without attendant present.
8. Do display a positive safety-conscious attitude for employees to follow.	8. Don't neglect housekeeping.
9. Do make sure guardrails and handrails are adequate, along with lighting and fire extinguishers.	9. Don't take care, custody, and control of customers' boats for the purpose of fueling.

10. Do take advantage of broker services.

10. Don't ever exceed rated lifting capacity of hoist equipment; may be grounds for denial of coverage.

Accounting and Budget Control Systems

*Tom Dowd**

An old Chinese proverb says, "It is better to go back and make a net than to stand on the shore and long for fish." That has a definite application to marina managers.

If the proverb were reworded for you, it would say, "It is better to have a financial plan and financial goals/objectives than to just drift along waiting for financial success"!"

In today's business environment, a marina manager must have a financial plan and goals/objectives in order to operate in the most efficient (profitable) manner. Without such a plan and lacking financial goals and objectives, a marina manager is often forced to "stand on the shore" and long for financial success.

This paper will provide an overview of two elements of establishing a financial plan and financial goals and objectives for your marina, the creation of an operating budget, and the establishment of basic financial controls to assist you in using your accounting system as a management decision-making tool.

The Budget

An operating budget is a management tool. It is a guide for the financial management of your marina. The first step in establishing an operating budget is to recognize the difference between fixed and variable expenses.

Fixed expenses are expenses that occur independent from the volume of business you have. These are management and full-time staff salaries, rent, heat-light-telephone, maintenance of the basic facilities, and any other costs that must be paid just to be in business.

Variable expenses are those expenses that are incurred because of the volume of business you have. These are part-time or seasonal employee wages, overtime salaries, and operating expenses of a seasonal or demand

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nature. For most marina operations, the major variable cost is for seasonal employees and overtime salaries/wages for the permanent staff.

Having determined what expenses are fixed and what are variable, you can now establish how much control you have of each category. As a general rule, management has substantial control over the variable expenses and limited control over fixed expenses. This is the initial step in preparation of an operating budget.

Step two in this effort is to review your expense items in order to ensure the reasonableness of the dollar amount of each. Your ability to accomplish this step with any appreciable amount of accuracy is almost totally dependent on having good accounting records. Having done this step, you can now organize these data to form the expense side of your operating budget.

	ACTUAL 1988	BUDGET 1988	ACTUAL 1987
Operating Revenues:			
Slip Rent	$ 301,625	$ 290,000	$ 286,721
Hoist	24,271	18,000	1,750
Tide Grid	5,726	5,800	520
Pump Out	1,884	1,500	1,256
Gas/Oil	79,112	75,000	68,815
Misc.	501	100	376
Total	$ 413,119	$ 390,400	$ 359,438
Operating Expenses:			
Salaries/Wages	$ 105,252	$ 100,000	$ 87,508
Office Expenses/Overhead	18,322	21,000	17,286
Gas/Oil	61,275	50,000	45,906
Maintenance	67,514	85,000	71,002
Outside Services	701	1,500	1,199
Misc.	585	200	15
Total	$ 253,649	$ 257,700	$ 222,916
Net Operating Income	$ 159,470	$ 132,700	$ 136,522
Operating Margin	38.6%	34.0%	38.0%

Step three is to form the revenue side of this budget. Here again, you must have good accounting records in order to determine these budget figures in a reasonably accurate manner. As part of putting together the revenue side of the operating budget, you should review your rates to de-

termine if they are competitive and also compensatory. It should be recognized that there is normally far less accuracy in the formulation of the revenue side of the budget than in the formulation of the expense side of the budget.

Step four is to match the revenue and expense sides of the operating budget. Hopefully, the revenue side is bigger than the expense side at this point. If not, you should redetermine the reasonableness of both revenue and expense sides. If they don't at least balance, you should look at cutting the expenses before you arbitrarily increase the revenue side to cover the expense side. (It has been my experience over some 25 years in business and working with businesses that there is a direct correlation between the amount of time/effort/energy spent on budgeting and the potential financial success of an enterprise.)

Step five, after establishing an operating budget that provides for a margin of profit (more revenues than expenses), you should then establish a method by which you track revenues and expenses at least quarterly to determine if your budget projections are accurate.

This format allows you to have a management tool to assist in determining how you are doing financially on an ongoing basis and to prepare budgets in the future. The budget now is a management tool and not just an amorphous document in your files.

Accounting Controls

Now that you have an operating budget and a management tool to provide to you an ongoing measurement of the reasonableness and accuracy of the budget, you can look at establishing additional financial management controls to assist you in managing your marina.

For many marina managers, the financial statement is a form of historical documentation of financial activity — a score-keeping tool. However, the information contained in the accounting records can help you manage your facility, if you are willing to use it.

Although there are a multitude of analysis methodologies available, one is most valuable for a facility manager — the *operating margin.*

The operating margin provides a measurement of profitability that can allow a manager to determine the financial viability of his facility or of the various functional units that make up the accounting system of his facility.

The operating margin is a formula (net operating income divided by operating revenue) that measures the profitability of any facility or function. Both "net operating income" and "operating revenue" are specifically identified in any financial statement that is prepared according to generally accepted accounting principles.

To get maximum benefit from an analysis of your operating margin, you should have at least three years of data.

	1987	1986	1985
Operating Revenues	$589,000	$503,000	$477,000
Operating Expenses	$220,000	$142,500	$119,000
Net Operating Income	$369,000	$360,500	$358,000
Operating Margin	62.7%	71.7%	75.1%

In the example shown above, analysis of the operating margin reveals operating margins of 1987 - 62.7%, 1986 - 71.7%, and 1985 - 75.1%. This means that 62.7%, 71.7%, and 75.1% of the operating income went directly to net operating profit — said another way, for every $1 of operating revenue, the marina put 62.7¢, 71.7¢, and 75.1¢ into net operating income. The difference between the $1 of operating revenue and the net operating income was spent in operating expenses.

From a financial management standpoint, this marina is performing poorly. Each year the operating revenue has significantly increased, but the net operating income (operating revenue minus operating expenses) has increased only slightly. The operating expenses have increased at a greater rate than operating revenues.

By tracking the operating margin, you have a single number that lets you measure profitability. This permits you to rely on one number as an indicator of the financial health of your facility or a specific function rather than be required to try to determine this from an analysis of the entire financial statement.

The monitoring of the operating margin provides you with a single management tool to use as an indication. If the operating margin increases, fine; if it stays steady, you may want to make some analysis of your operating revenue and expenses; and if it declines, you need to step in quickly to analyze these factors.

A manager has some control of both operating revenue and operating expenses. The operating margin provides a way to determine when to exercise that control. Additionally, since operating margin analysis gives you a trend line, it can often signal a problem before the problem becomes a disaster.

If you wish more information on using financial indicators such as operating margin as a management tool, you should request a copy of the Washington Sea Grant publication "Port Management Control System—A Simplified Decision Making Tool" (WSG-AS 83-2).

Financing for Port and Harbor Districts
The Changes, The Choices

*James D. Colfer**

Historically, leasing — which includes municipal leasing, bonds and installment sales financing — has specialized in financing for equipment used by state and local governments, as well as commercial enterprises. These equipment needs have traditionally included vehicles, computers, fire trucks and other apparatus; material handling equipment, and telephone systems.

In the past several years, the realm and role of leasing have greatly expanded. Leasing is now an option for "brick and mortar" structures, such as docks and wharfs, school buildings or offices...for golf courses...for water and sewer systems...for technologically advanced systems such as cogeneration projects and energy-savings retrofittings.

There is also a great surge today toward "project lease financing." Project financing includes the land acquisition, engineering design, and construction financing, as well as construction of the project — all bid as one package. Marine facilities are ideal prospects for this type of financing: it offers longer terms and very attractive interest rates.

Port and Harbor Financing

For the past 15 years, port and harbor districts have used lease financing for a variety of equipment needs:

- Wharfs
- Docks
- Cranes
- Fire-fighting systems
- Hoists
- Cargo-handling equipment

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- Marina slips
- Fire and rescue boats
- Office buildings
- Water and sewer systems
- Computers and almost all other equipment used to carry on the day-to-day activities of a busy port.

A Very Brief Lesson in Finance

ABOUT TAX EXEMPT FINANCING

Tax exempt financing has nothing to do with a port or harbor's exemption from sales or property tax. Rather, it has to do with the interest income earned by investors who purchase bonds or leases for publicly owned facilities (political subdivisions).

The interest income from these financings is exempt from federal income tax, and in some states, state income tax. Therefore, the net yield, or interest rate of these financings, is generally lower than for a comparable commercial transaction.

ABOUT BONDS AND LEASES

Here's a comparison of bonds, leases, and installment sales:

BONDS

- Require vote of the people
- Do not require annual appropriation
- Larger in dollar size — smaller bonds are generally too costly to issue
- Slower to develop

LEASES

- Do not require public vote
- Usually require annual appropriations
- Usually less costly to issue; can be for smaller amounts of money
- Quick to develop

INSTALLMENT SALE

- Same as lease purchase financing.

Congressional Changes

Until Congress decided once again to "simplify" the federal income tax system, life was quite jolly for leasing companies and port and harbor districts. It was relatively easy to offer tax exempt financing to potential port tenants to finance structures or improvements. However, with the

1986 Tax Reform Act, things began to happen that were not necessarily in the best interest of either leasing companies or ports and harbors.

One of the main intentions of the Tax Reform Act was to simplify and improve the method of taxation by eliminating loopholes. It was also Congress' intent to eliminate abuses in the issuance of tax exempt bonds and other financing instruments such as leases, tax anticipation notes, and industrial revenue bonds.

In particular, industrial revenue bonds had been used with flagrant abuse. For example, a major retailer or restaurant chain could finance construction through an industrial revenue bond, sponsored by a local government agency at tax exempt rates of interest. This type of abuse deserved to be curtailed, particularly when there were so many greater needs going unaided. And it was curtailed, thanks to the Tax Reform Act. That's the good news.

A TOUGH BLOW FOR PORTS AND HARBORS

But now for the bad news. The Tax Reform Act of 1986 hit port and harbor districts right between the eyes. Throughout the years, ports were developed by the use of industrial revenue bonds. Along with their development, they brought much-needed jobs and revenue to the area. Tax exempt financing through industrial development bonds built marinas, fish processing factories, lumber terminals for major timber companies, boat repair shops — all the facilities needed to develop the ideal port property.

Unfortunately, the Tax Reform Act viewed a fast-food outlet and a marina with the same legislative eye. Therefore, just as a fast-food outlet can never rely on industrial revenue bonds, neither can a boat repair shop or other port property. Well, almost never. Just before all was lost and all tax exempt financings were eliminated from port activity, Congress had the wisdom to make two exceptions to this far-reaching law.

THE EXCEPTIONS

The Tax Act specifically states that government owned and operated docks and wharfs can still use tax exempt financing. Also, equipment for cargo handling, hoists, cranes, dock-related storage and office areas associated directly with the government-owned docks and wharfs can be financed with a tax exempt alternative.

Private Marinas

Although marinas often are privately owned and operated, they are usually located in Port Districts on Port District property. Consequently, marinas can use tax exempt financing in some cases, but rarely. Those marinas that are owned and operated by a Port can still qualify for tax exempt financing.

In general, privately owned marinas have not been drastically affected by changes in the tax law. Commercial financing is still available, with little change other than those tax technicalities that may have an effect on interest rates.

Financings that are tax driven or structured to be tax shelters have lost their allure. There is no longer an investment tax credit; depreciation schedules are longer. While these two factors do deserve some consideration, their overall effect is minimal.

Tax Exempt Financing Options

Practically any new financing done today as a tax exempt issue is going to fit under the umbrella of private activity bonds. The law has become excruciatingly precise as to what does and does not qualify for a private activity bond.

Usually, ports and harbors can use tax exempt financing for a dock which commercial vessels use on a day-to-day basis. However, assume a cruise line promises to stop weekly at a port which provides a dock specifically designed and built for its exclusive use to accommodate passengers. This dock construction would not qualify for a tax exempt private activity bond. Every prudent leasing company relies on the opinion of qualified bond counsel for these types of hair-splitting decisions.

A second funding option available to ports and harbors is the public purpose bond or lease. To qualify for this option, 95 percent of the funds used to finance the project must be used for a "public purpose." An example:

A dock is installed which accommodates private small craft, yet it is open to the public 100 percent of the time. This dock could be constructed through a public purpose bond or lease. However, a private marina, open only to those leasing or purchasing space, would not qualify.

The third option in tax exempt financing is industrial revenue bonds. These are available mostly in theory; in reality, industrial revenue bonds are almost nonexistent for port financings today. Those that do exist are available only for financing manufacturing facilities.

If a port has a manufacturer that wants to locate on port property, an industrial revenue bond is at least a possibility which should be investigated. But be cautioned: each state is restricted in the total amount of tax exempt revenue bonds which can be issued during any one year. A port interested in an industrial revenue bond for a manufacturer must become part of the total volume allocation that the state is allowed. Also, there are restrictions as to the size (in dollars) of an industrial revenue bond.

The Cost of Financing

Private activity bonds generally cost about 50 basis points (1/2 percent) more than a public purpose bond or lease. This is because the bond holder is subject to the alternative minimum tax, another element in the 1986 Tax Reform Act. Industrial Revenue Bonds generally will be 150 to 200 basis points greater than a public purpose transaction.

Improvements, Refinancing Existing Loans

In addition to new construction, tax exempt financing can be a money-saving option for ports and harbors in need of improvements. Refinancing an existing loan with tax exempt funds can improve cash flow by lowering interest rates or extending the term of the loan. Many bonds or leases were written during times when interest rates were high. They can be rewritten saving thousands of dollars over the remaining term.

Commercial Financing Options

Sometimes public facilities need to explore the alternative of commercial financing instead of tax exempt financing. Consider these points:

- In today's bond market, interest rates between tax exempt and commercial financings are not that far apart. In fact, tax exempt bonds are approximately 85-90 percent of the commercial rate.
- A commercial transaction sometimes offers the advantage of arbitrage, a factor very limited on a tax exempt transaction.
- A commercial transaction can be structured so that it is subject to an annual appropriation and any other statutory requirements of political subdivisions.
- A commercial transaction is significantly less complicated to arrange than a tax exempt bond or lease.
- Consider credit clout. Generally, small ports do not have the credit clout that a major port does, such as the Port of Seattle or Portland. This means smaller ports often don't get a preferred interest rate and the cost of money will be up to 3 percent higher.

The summation of these five points is this: tax exempt financing is not always the best alternative. Weigh the options, bargain and negotiate.

A Successful Use of Commercial Financing

Recently in California, a port authority built an office building. Sixty percent of the structure was used by the port authority; the balance of space was rented to customers of the port authority. The intent was for rental revenue from these commercial customers to reduce the net cost of the building.

This project did not qualify for tax exempt financing, but it was very easy to structure as a taxable lease. The transaction did not require public hearings because it was structured subject to annual appropriations of funds and was approved by the port board of commissioners.

Prior to construction, the port had been renting space at a rate equal to the new debt service on their building's taxable lease. The net result was a substantial savings in office space cost, and a facility that was designed for the port's use.

A Buyer's Market

While the law is the law, and the Tax Act is the Tax Act, those in need of new or improved facilities and equipment should not be discouraged from exploring the range of financing possibilities.

Financing is readily available in all cases; it just may not be tax exempt. This drawback has been softened by today's excellent commercial financing opportunities.

It's a buyer's market and the competition among financial institutions is great. Ports, harbors, and private marinas can enjoy the advantages of a stable economy, a heavily competitive financial marketplace, and lower interest rates for the projects they need to finance.

Organizing for Political Effectiveness

*Rick Slunaker**

Washington has a citizen legislature. Legislative sessions are limited by the constitution, convening in odd-numbered years on the 2nd Monday in January for 105 days to approve the biennial budget for the state. During even-numbered years sessions are convened on the 2nd Monday in January for 60 days. Special Sessions may be called by the Governor, or by the Legislature itself with a two-thirds majority vote. Interim activity increasingly has become more important in preparing for these legislative sessions, with formalized committee weekends usually held in Olympia, as well as periodic committee meetings held in Olympia and around the state.

To accomplish their goals, all legislatures rely heavily on a broad range of input from a variety of sources. Even though a great amount of technical information is generated by legislative and state agency staff as well as interest groups and lobbyists, much of the legislature's final decision process is influenced by the views, interests, and preferences (real or perceived) of the electorate.

Information Overload is not only a fact of life, it is a way of life in the legislative arena. It is first demonstrated by the presence of 14 standing committees in the Senate and 21 in the House. To influence the process successfully, information overload must not only be recognized, but managed. It is necessary for competing interests (all interests are competing for the one essential element: a legislator's cognition) to keep their issues, concerns, and positions "visible" before members of the Legislature (and their staff). Failure to educate new legislators and to refresh incumbent legislators of your existence and desires runs a substantial risk of your becoming "lost in the shuffle" of legislative business.

For the most part, the legislative process and system are conservative in nature. That is to say that "things take time" and it may take more than one session for the "system" to recognize and digest issues and proposals. "Educational" and "evolutionary" processes are quite often the order

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of progression for a new idea, giving a new meaning to the term *"Recycling."*

The Legislative Process, like everything else in life, can't be separated from its human elements. It is perhaps the ultimate "people process." Both the legislative process and the issues that feed it are human at the core and "working the process" requires "working" its people (members and staff).

Winston Churchill could as easily have been describing the state legislative process as the USSR when he said:

"It is a riddle wrapped in a mystery inside an enigma."

I prefer a Disneyland analogy: The legislative process is much like the Magic Kingdom. There is Adventureland, Tomorrowland, and Fantasyland. It is definitely a world of its own, with its own language, customs, and natives. But it is not as closed as it once was. In fact its inhabitants are usually truly genuine in their desire to hear from the "outside world."

One thing is clear: *Information is the coin of this realm and your integrity is your line of credit.*

Knowledge is your passport in this Kingdom.

Know yourself: your personal prejudices and biases. This will enable you to anticipate your responses in a given situation — which will help maintain your objectivity in "battle." Know your business and industry, its drivers and constraints and how they impact outside the "business" (when squeezed, where will the balloon bulge out next?)

Know your organization, its characteristics and development. What are its purposes (i. e. legislation, insurance, support for goods and services, professional/social). Be aware of the interdependencies and conflicts of its membership — their commonalities and differences, the relationships it has with other organizations and the legislature. Ignorance will tarnish your image and lessen your effectiveness.

Make the *commitment to succeed* legislatively. Organize internally to effectively launch a legislative effort. Make it known that the group is prepared to do what is necessary to address the issue with responsible solutions and is committed to work to achieve them. Such a commitment will require expenditures of time, effort, and money. *Follow through.*

Know your issue: Be able to phrase it in your own terms and to your own circumstances. You needn't have all the answers all the time. You must be willing and able to follow up with responses. Never guess — Say you don't know but will get back with a reply as to what effect your proposal will have in and outside the industry, its ramifications and impact on government and other interests.

Issue selection is important to presenting a positive image for your organization. Successful efforts are focused, not myopic. Avoid a single issue mentality and perception. An old football axiom held that when passing the football three things can happen; and two are bad. In this game, with a single-issue game plan, even if you win you lose. A single issue approach requires agreement or disagreement as the only acceptable response. If the effort is successful the group is forgotten, because "It's done." If you failed, "We took a shot and it's not worth retrying."

Your organization can be successful if three rules are observed when developing your image:

- *Build on a single unifying issue* to become a respected, reasonable, and reasoned organization. Be willing to see the "other side."
- *Don't bite off more than you can chew* The Heimlich Maneuver is not performed very often in the legislative arena. Avoid the "What is it now?" syndrome.
- *Send clear signals.* Even if they're aware that there is disagreement amongst the group. Forthrightness is rewarded with respect.

Know your legislator: Whichever one you're dealing with (i. e. constituent or committee chair). Try to understand the basis for his/her positions: background, past record/votes, party, position in caucus, tenure, district, personality. You possess the capacity to build personal relationships with at least three legislators (from your district). Out of such relationships you may significantly contribute to the quality of legislative effort and product. Your legislators are also your neighbors, often sharing many of the same interests and concerns. Build on these to develop positive relationships. They're your legislators, even if you didn't vote for them, and they want to hear your views.

Take a long-range view. An organized approach, a structured effort, and recurring contact with key legislators will benefit your organization over time. Specific issue-related contacts ("problems"), coupled with relationship building activities ("what's happening in our group/field") develop long-term awareness and familiarity as well as understanding and acceptance of legitimacy for your organization.

Avoid surprising a legislator in the midst of the process: Tell friendly legislators the upside and downside of a proposal. Let them know how it impacts all involved. They must be able to protect against "blind side" attacks. Don't "cross" your opponents by saying one thing and doing another. Fight a fair fight and you will earn respect because today's foe may be tomorrow's friend!

Know your opponent: Even if it's only inertia — i.e., "Why change?" Be able to explain your opponent's position as well as he can. Such ability will allow you to anticipate the opposition and answer his arguments before they are made.

Some Tips

TESTIMONY

Testimony at a committee hearing is fairly informal, with a few "rules" to ensure effectiveness. Clearly identify yourself, your organization, and its relative position in the "big picture," and your position on the legislation at hand. Be organized in your testimony — brief and to the point, not too technical. Written testimony is always helpful, but *don't* read it. Distribute it and make related comments. Avoid duplication — coordinate with others if possible to cover different aspects of the matter. Relate impacts to profession, community and organization, drawing on personal experience and professional expertise. If questions are raised which you can't answer — don't guess. Commit to providing a followup response — then do it. Avoid audience displays such as cheering and booing — save the wave for the football game!

PERSONAL MEETINGS

Personal meetings with all 147 legislators, while nice, are probably not necessary to achieve legislative goals. Focusing on key legislators, then, becomes a much more effective and desirable use of time. Key members of legislative leadership, committee chairs, and selected members with interest in the issue or influence in the Chamber are a good place to start — and finish if you're lucky.

Make an appointment for a specific time to make your initial presentation. Meet with staff if unable to make initial meeting with the member, and certainly inform him later. Followup "buttonhole" interviews should be used to refresh commitments if needed, but only rarely used to introduce new material. Relate the issue concisely and honestly, withholding nothing (well don't be fanatical...) and convey your sense of the relative urgency of the matter to your organization and "society". Change "Are you interested in this idea?" to "Please vote against it tomorrow!"

GETTING WHAT YOU WANT

Ask for *specific action* — make it clear what you are asking the legislator to do for you and why it is important to both of you. Make certain you haven't misled or misrepresented the situation. Make sure that you understand the response given. *Count votes.*

LEAVING AN IMPRESSION

Leave legislators with something to remember you by (preferably positive) and to refer to in the future. A prepared fact/summary sheet; issue paper; pamphlet — even from your business; business card — with notes which will help them remember and associate the issue with a living person.

JOGGING THEIR MEMORY

Follow up with a short note which you may also use to answer any "hanging" questions and maybe to add one more tidbit. Be certain to reiterate any commitment given to you or by you and to reinforce your specific request for action.

Legislative effectiveness is somewhat akin to target shooting — a small adjustment at the muzzle translates into significant effect at the target. It is possible to make last-minute deflections — but they're very difficult and dangerous...

Some Do's and Don't's

DO —
- Identify yourself when approaching legislators — don't assume they remember your face
- Recognize the importance of staff to your effort/success
- Keep confidences confidential
- Keep the door open for further and continuing discussions when faced with negative responses
- Remember they're people too
- Be brief and followup periodically
- Be as positive as possible in dealings
- Be clear and concise in stating your concerns and in asking for commitments
- Try to establish "off the field" relationships
- Be timely in your contacts

DON'T —
- Threaten
- Be too technical or condescending
- Back recalcitrant legislators into a corner
- Pretend to be a big shot (unless you really are...)

Ben Franklin is attributed with the saying "Better to keep your mouth shut and be thought the fool, than to open it and remove all doubt." With some planning and effort, you can not only open your mouth and not be

thought the fool, but be effective in representing your organization in the bargain.

Marina Management Programs for Personal Computers

*Kevin Culver**

Computing Power

A tremendous amount of computing power can be placed on today's desk top for a very reasonable investment. To gain a better perspective on this, let's take a look back at the recent development of the personal computer.

Computer Development

My first encounter with a computer was around 1978. Tandy Corporation had begun marketing the TRS-80™ Model I computer. With a grand total of 4k (four thousand) bytes of memory and no long-term storage (disk or tape) device, the unit was a marvel, at about $500. The system scarcely had enough memory to start itself up, let alone perform any truly useful task, and without a long-term storage device, none of the hard-earned data processing could be stored once the machine was turned off.

In these early days of personal computing, one could not expect to gain any real productivity without becoming, or hiring, a programmer. The personal computer then underwent an evolution resulting in increased power and performance and proportionately lower cost, a process still at work today. The TRS-80 was soon sporting 16k of memory, followed shortly thereafter by a whopping 48k. A TRS-80 Model III with 48k of memory and two floppy disk drives sold for around $3,000. A parade of other computers followed. The Commodore 64™ with 64k of memory (no monitor, tape, or disk drive) came to market at an unbelievably low price of $199.

In 1981, IBM changed the world's perception of the personal computer, taking it from the realm of the hobbyist into the business world. The first IBM PC™ came with only 64k of memory (RAM), but had the

* ARTHUR Micro-Systems, Lincoln City, OR

inherent capacity to be expanded to 640k! It was not thought at the time that computer programs would ever require that much work space.

Of course, some of today's personal computers are designed to be expanded to 16 megabytes (read 16,000k) of memory. By virtue of simply being IBM, they established a much-needed standard for the personal computer industry.

Send in the Clones

Soon after the introduction of the IBM-PC™, Columbia Data Products of Columbia, Maryland, introduced the first IBM-PC imitation. One of the first Columbia Data Products computers, with 128k of RAM, a 360k floppy drive and a 10 megabyte hard drive sold for approximately $4,500. As other manufacturer's brought their "clones" to market, the competition stiffened. As a result of the standardization and the competition, computer hardware has become a commodity. A system based on the same CPU as the Columbia Data Products system I just mentioned, with twice the speed, and twice the hard drive capacity can be acquired today for around $1000. This represents nearly a 90% improvement in the cost/performance ratio. Of course, the development of the personal computer has not stood still. The IBM-PC is a first-generation IBM-type system. Third-generation IBM-type systems are now being marketed, i.e. the so-called "386" systems, with the IBM-AT having been the second-generation.

Who Needs a Computer?

It might be appropriate at this point to pose the question, "How big must a business be, to justify the cost of a computer?" At today's prices, nearly anyone can justify the investment. Nearly all businesses would benefit greatly by having a computer in use as a word processing system, and even the smallest, could justify an entry-level system cost-wise. The question should not be, "Can I justify owning a computer?" but "How much of a computer system do I need?" An independent consultant, or consulting computer sales organization can help you answer this question.

Obsolescence

"Everything changes so quickly." "How can I be sure the system I buy today will not be obsolete tomorrow?" Before IBM entered the personal computer arena, there were as many different computer operating systems as there were computer companies. For the most part, these computers were not compatible with each other. That is, programs and data could not easily be transported from one system to another, if at all. Certainly, hardware from different vendors could not be used together in a system.

Obsolescence could occur instantly, if a company went out of business, as many of them did. Because of the de facto standard established by IBM's introduction of the PC, we have a much more stable environment today. To a very high degree, virtually all components of the so-called IBM-compatible computers are interchangeable. The purchaser of these systems is no longer dependent solely upon the particular companies that manufactured them. If a component fails, the owner can acquire a replacement from literally hundreds of other sources. There is also safety in numbers. Although newer, faster machines are constantly being developed, the systems in use at this moment will remain in use as viable tools for many years, by virtue of sheer numbers. The computer industry can not afford to abandon the millions of personal computers installed in America's homes and businesses.

What Type of Software?

Okay, so personal computers are relatively inexpensive, readily available, and serviceable. You might ask, "What kind of software do I need?" For purposes of discussion we'll divide software (programs) into two major categories; "Off-the-shelf" and "Custom". Off-the-shelf software is available in thousands of titles, covering nearly everything imaginable. Some of these programs are highly specialized, and in many cases will be sufficient for many businesses. These programs are generally rather inexpensive, ready to use out of the box, and do not require undue amounts of training. Off-the-shelf software often falls short, though, in meeting the specific needs of "unusual" businesses where high degrees of automation are desired. Marinas by their nature tend to fall into this category. I know of no off-the-shelf software that handles the diverse inventory and billing needs of marinas and/or port districts "out of the box."

CUSTOM SOFTWARE

The term "custom software" historically has referred to programs written from scratch, and dedicated to a specific set of functions, for a specific individual or organization. Custom software is expensive to develop, and expensive to support, making it available only to larger businesses.

OFF THE SHELF

Let's go back to "off-the-shelf" software. Among the readily available software packages, there are two primary groups: "stand alone" and "integrated." We've all heard of Lotus 1-2-3™, Dbase III™ and Wordperfect™. These are considered to be the premier stand alone software packages for today's IBM compatible computers. They represent the

three primary personal computer uses; spreadsheeting, database management, and word processing, respectively.

MOM & POP VS. CORPORATE AMERICA

Before we discuss integrated software, I would like to share an observation with you. This observation is based on five years of working to meet the needs of many small businesses and public agencies. America's small businesses must realize that most major media campaigns are targeted for corporate America, not for you and me. While your and my needs are similar to corporate America's, they have mainframe computer systems, you and I do not. Most personal computers in the corporate environment are used by specialists, or for accessing data on the mainframe computer. These specialists might be budget officers running spreadsheets or secretarial pools using word processing programs, and so forth. For the most part, the flow of information and automation of the organization are handled by the mainframe computer. Small organizations desire the same degree of automation and information flow as corporate America. However, in "Mom and Pop" America, the personal computer becomes the mainframe, and those three premier personal computer software packages I mentioned earlier, while great for specialists and individual projects, don't come close in my opinion to meeting the diverse automation needs of the smaller businesses and organizations.

INTEGRATED SOFTWARE

Thus the case for Integrated Software. By definition, integrated packages combine the capabilities of spreadsheets, databases, and word processors. Some have additional presentation graphics, outline processing, communications, and other features. These packages represent a much less expensive investment than purchasing stand alone products in each category. Plus, the fact that all modules are made to work together means that they will usually be better integrated and able easily to use each other's data. Finally, most integrated software is designed to use the same keystrokes for similar functions in each application, making them easier to learn. In summary, good integrated packages when properly implemented provide a complete computing environment, capable of a high degree of automation and movement of data within the organization. If the integrated package contains a powerful programmable database management module, the organization can quickly develop applications that are customized for their particular needs, at a fraction of the cost of true custom software solutions. Let me make something very clear at this point. I do not recommend integrated software because I sell it. Rather, I came to a point where I began selling it because it fills a real need.

So, Where is the Marina Management Software?

Do not expect to find off-the-shelf marina management packages. Any packages that do exist would be available generally through software companies like mine that specialize in marinas and port districts. The packages available from these companies would either be dedicated custom packages written in languages like compiled BASIC or PASCAL, or programmable database management programs like Open Access II ™ or Dbase™. My advice for small marinas is to look for the systems written with the database management software. These programs are very easily modified, and when compiled, will execute quickly. In addition these programs are much easier to support, and leave the marina operator much less dependent upon the developer than the dedicated custom programs. Only very large operations can afford the cost of acquiring and maintaining the dedicated systems. Look for good integrated software with a high degree of flexibility, consistency, ease of data transfer between modules, and portability to networks. If you contract with a software developer to modify your programs, make sure you are provided with the source code for the program, and full program documentation for support purposes. This will be invaluable in the event you are left looking for a new source of support.

Pricing Boater Services

*A Uniform Approach to Public Moorage Rates**

*Karl A. Wallin*** *and Robert D. Keller****

Purpose

To develop a moorage rate structure on a cost-recovery basis which will yield an equitable return to the public marina owner for the facilities and services provided for the benefit of the boating public.

Discussion

Each port district owner of a public marina must first determine and establish the boundaries of the "Economic Unit" within which costs and revenues can be precisely identified.

For the purpose of this paper, we will consider the boundaries to be the immediate periphery of the water space of the marina as described by bulkheading, jetties, breakwaters, and/or land masses shaping that water space. Adjacent uplands, if provided and dedicated to parking of vehicles, dry land boat storage and administrative/maintenance facilities, should be incorporated as elements of the economic unit.

The public marina owner must consider the water space within the marina together with the moorage facilities provided as a revenue producing resource similar to his other industrial properties and improvements. The fees charged for the use of these public marina assets must be established with like considerations and rationale used by the port district in its stewardship of its industrial properties. Anything less than 100% cost re-

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* This paper was first presented, under the title: "A Uniform Approach to Establishing Public Marina Moorage Rates", to the Washington Public Ports Association's (WPPA) Marina Committee, at the WPPA Spring meeting, held in Yakima, Washington, May 9, 1980

** Director of Operations, Port of Grays Harbor, Washington

*** Ports Consultant and Former Chairman, Washington Public Ports Association Marina Committee

covery is subsidy for the benefit of the user groups — at the expense of the port district's constituency.

A uniform fee for the rental of moorage may be applied in a number of methods. Two viable approaches are based on "square footage" or "length of vessel." If judicious planning and engineering of facilities have provided for the optimum efficient usage of the available water space, the "length of vessel" approach is the less complicated to compute and administer. This approach also is more readily understood by the user-group.

However, to predicate moorage fees on the "length of vessel" approach, one may run afoul of a complication an astute critic might use to the user-group's advantage. Should the public marina owner establish his unit rate by dividing his total costs by a set number of lineal feet of moorage capable of producing the required revenue, and then apply that unit rate to generate the maximum revenue available (i.e.; float length is minimum, excess boat length produces maximum), he must be well-prepared to defend that action of producing excess return on investment where, hypothetically, none is to be produced.

Another area of excess return on investment production that may have critical focus is that of transient moorage revenues. If the permanent moorage fee produces 100% cost recovery with 100% occupancy, then transient moorage revenues are "excess." Such "excess" may have to be factored into the rate structure as a credit.

Finally, the appropriate fee determined by each marina owner must be fair and equitable. It should be uniform, and applied uniformly, irrespective of vessel length, usage, proximity to the shore, demand for moorage, etc. The established fee must not, however, be "cast in concrete"; rather, it must be responsive to changes in maintenance, utility and administrative costs as well as periodic reevaluation of water area rent.

Elements Considered in Determining Total Marina Costs

(I) INITIAL COSTS:

- (A) Planning
- (B) Engineering
- (C) Permits/Environmental Assessments (E.I.S.)
- (D) Mitigation
- (E) Site Development (including, but not limited to, dredging, etc.)
- (F) Consultant Fees

(G) Construction Costs
  (1) Moorage Facilities
    (a) Utilities
  (2) Support Facilities
    (a) Structures
    (b) Parking
    (c) Lighting
    (d) Security
    (e) Local sponsor's cost-sharing expenses associated with federally-funded improvements. The federal share would be provided as a national benefit and would, therefore, not be included.

(H) Financing
  (1) Reserve Funds
    (a) Loss of interest earning capability
  (2) Bond Issue Cost
  (3) State and Federal Loans and Grants
  (4) Financial Consultant Fees

Amortization of these "first costs" would occur during the projected "life" of the facility, such as 30 years currently considered appropriate for concrete/styrofoam facilities. Certain elements of the "support facilities" grouping might justify consideration of a longer or shorter term on a specific basis.

A rate of depreciation to determine the annual required revenue may be retrieved by various approaches:

RESERVES/GRANTS

Public ports' "cost of money" is generally tied to the municipal bond buyers index. Suggest consideration to utilize this index at time of expenditure multiplied by the appropriate coverage (see following discussion).

REVENUE/G.O. BONDS AND LOANS

Revenue bond financing done by a port would probably require 1.35 to 1.40 times the annual debt service requirements. This excess "coverage" of 35% to 40% is normal for any type of revenue bond financing; however, this percentage may vary dependent on a port's financial health, diversification of revenue base, and other factors. It has been found over the years that specific coverage-added is necessary to provide adequate cash flow for capital improvements, reserve fund, etc. To the extent that

one would want to isolate the feasibility of a marina or any other specific project, it is necessary that the net operating revenues of the marina facility be established in a manner so as to produce the excess coverage in addition to retiring the debt service allocated to marina projects. If this is not done, then the marina financing coverage must be provided by revenues from other port sources.

It is imperative that the marina owner continue to receive a fair market return on his investment after the amortization period of first costs has elapsed. The facilities continue to be an asset of the port district and must participate together with other district assets in producing revenues.

(II) UTILITY COSTS

(A) Electrical Energy

(B) Water

(C) Garbage Collection

(D) Sewer

(E) Other

Apply previous year costs (adjusted as necessary) or contracted annual costs on a pass-through basis against the impacted moorage.

(III) MAINTENANCE/REPAIR COSTS

These are self-explanatory; however, difficulty arises whether to apply in arrears or on projected/budgeted cost basis. Application of previous year's cost, here as in Items II and IV, is the most accurate way; however, an interest charge consistent with the individual district's policy regarding unpaid account balances should be assessed. Whichever approach is adopted, consistence thereafter is important.

(IV) OPERATING/ADMINISTRATIVE COSTS

Comments in Item III above are appropriate to this item also.

(V) WATER/HARBOR AREA RENT

The marina owner either owns, in fee, all or a portion of the underlying land beneath the water surface or leases that area, generally from another government agency. If leased, the cost of the water area is identified.

If value is not known, the port district should determine by a fair market value appraisal considering all out-of-pocket costs spent to create the marina. Improvements within the confines of the marina are not included; these would be addressed in Item I.

When the value of the total marina area is known, the unit measure or value must be adjusted to the revenue-producing portion of the Marina and applied thereto.

Access channels, turning areas and other common use areas would be excluded. The annual percentage return to the adjusted total value should be consistent with the port's applied percentage rent for ground leases.

Postscript

The following is an excerpt from the WPPA's "MEMBERS LETTER," dated May 15, 1980:

MARINA RATE FORMULA ADOPTED AT YAKIMA

"A uniform approach to establishing public marina rates was adopted by the WPPA Board of Trustees at their May 8-9 meeting in Yakima. The cost-recovery based formula has been a priority of the Marina Committee since April 1977. Its adoption may be a major step toward settling cost disputes which have inflamed the boating public whenever and wherever moorage rates have been raised.

"The uniform guidelines, which are not binding on member ports, will not equalize moorage rates throughout the state. They are intended to set out in plain language a method for determining the break-even cost of building and operating marinas at public ports. Since each construction job and all maintenance work will be unique to each site it is expected that each marina will continue to have different moorage rates.

"Karl Wallin, Port of Grays Harbor, is largely responsible for compiling the formula.

"It was the general feeling of the membership that public marina rates should not be based on 'what the market will bear,' but rather on a cost-recovery system which will benefit the boating public."

Pricing Boater Services:
Salmon Harbor, Oregon

*Bill Bradshaw**

This paper describes how Salmon Harbor's moorage rate structure, our rates charged for camping, our launching fees, and our land lease rents were upgraded.

In 1978 we developed a rate structure which did yield an equitable return to Salmon Harbor for the facilities and services we provide for the benefit of the boating public.

The basic premise considered is that the water space within the harbor is a revenue-producing resource. The boat owner is permitted to moor his vessel in the water space adjacent to a designated slip, which provides that owner with a nonexclusive right of access to his property.

Vehicle parking, camping space, and modern clean restroom facilities were also provided. Other services were also made available, such as boat launching ramps, and there are 22 land leases providing support services for the boating public.

These services include boat repair shops, restaurants, businesses providing fishing tackle and groceries and anything that a sport or commercial fisherman might need.

In the absence of a fair market value appraisal with which to gage the value of that water space resource or the land itself, we used the cost of operation, such as maintenance and administration, to establish evaluation for the water space and property within this facility. If one generates a prescribed amount of moorage at a known total investment and expense and ties that rate in with the land leases, then that identical amount of moorage and land lease rent along with camping fees must generate a revenue level that will compensate Salmon Harbor, Douglas County, Port of Umpqua for its investment and expenses.

A uniform fee for the rental of water space and land lease rent was established back in 1978 and adopted in 1979. We adopted the length of the vessel or the length of the slip, whichever is greater. This rate if in-

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* Salmon Harbor Moorage Manager, Port of Umpqua and Douglas County

creased on moorage would also increase the established land lease rent at the same time.

Because of the planning and engineering of Salmon Harbor facilities for the optimum efficient usage of the available water space, the length of vessel approach or slip was the least complicated to compute and administer. I believe it was also easier understood by the user groups and was acceptable by the majority of the boat owners.

We did predicate moorage fees on the length of the vessel or slip, whichever is greater, and we tie this rate in with the land lease rent. As anticipated, we did run into somewhat of a complication with at least some harbor patrons who did use this to the user group advantage. Salmon Harbor established the unit rate by dividing its total cost by a set number of lineal feet of moorage capable of producing the required revenue, and then applied that unit rate to operate the maximum revenue available (i.e. float length is minimum, excess boat length produces maximum), and we were well prepared to defend that action of producing a profit, or as you might call it, excess revenue. We know there is no excess revenue if we are going to be paying for capital improvement projects and continuing to upgrade the harbor.

Under the length of vessel approach, the fee determined by the Salmon Harbor Management Committee was fair and it was equitable. It was uniform and it was applied uniformly irrespective of vessel length. The established fee, however was not cast in concrete nor was it unresponsive to changes in maintenance, utilities, or administrative costs.

The question did come up and we did advise the public when it was necessary that the rate structure was to cover our initial cost of operation as well as payback for our capital improvement projects.

The cleanliness of the harbor, along with public safety, was foremost in our management procedures.

The criteria we considered:

(1) INITIAL COSTS

- (a) Planning
- (b) Engineering
- (c) Permits / environmental assess. (EIS)
- (d) Mitigation
- (e) Site development, including but not limited to dredging, etc.
- (f) Consultant fees

(2) CONSTRUCTION COSTS:

(a) Moorage facilities
(b) Utilities
(c) Support facilities
(d) Structure
(e) Parking
(f) Lighting
(g) Security (very poor in winter - should be upgraded)
(h) Aids to navigation
(j) Etc.

As we did at that time, back in 1978, we made a comparison of our rate structure with other harbors just to show the public that we would remain low under the proposed rates. When we upgrade the rate structure of Salmon Harbor this time, we will still be somewhat low. However, I don't believe there will be a problem coming up with the answers on why we have chosen to remain low.

Since 1981, the salmon fishing seasons became shorter, and shorter, our revenue continued to drop, our moorage facilities were no longer in demand as they were in 1978 and 1979. We no longer had a waiting list for moorage. The problems we experienced will have to be considered as we upgrade the rates.

EAST BASIN @ $9/FT.

(A-DOCK ONLY)

Vessel Length	Weekly Rate ($)	Monthly Rate ($)	Annual Rate ($)
16'	14.15	42.75	200.00
17'	14.95	46.15	211.00
18'	15.75	48.55	222.00
19'	16.60	51.00	233.00
20'	17.40	53.40	244.00
21'	18.20	55.80	255.00
22'	19.00	58.25	266.00
23'	19.80	60.65	277.00
24'	20.60	63.10	288.00
25'	21.40	65.50	299.00

(ALL OTHERS)

Vessel Length	Weekly Rate ($)	Monthly Rate ($)	Annual Rate ($)
16'	11.80	36.70	168.00
17'	12.45	38.65	177.00
18'	13.05	40.65	186.00
19'	13.80	42.60	195.00
20'	14.45	44.60	204.00
21'	15.10	46.60	213.00
22'	15.75	48.55	222.00
23'	16.45	50.55	231.00
24'	17.10	52.50	240.00
25'	17.75	54.50	249.00
26'	18.40	56.50	258.00
27'	19.05	58.45	267.00
28'	19.70	60.45	276.00
29'	20.40	62.40	285.00
30'	21.05	64.40	294.00
31'	21.70	66.40	303.00

Vessel Length	Weekly Rate ($)	Monthly Rate ($)	Annual Rate ($)
32'	22.35	68.35	312.00
33'	23.05	70.35	321.00
34'	23.70	72.30	330.00
35'	24.35	74.30	339.00
36'	25.00	76.30	348.00
37'	25.65	78.25	357.00
38'	26.30	80.25	366.00
39'	27.00	82.20	375.00
40'	27.65	84.20	384.00
41'	28.30	86.20	393.00
42'	28.95	88.15	402.00
43'	29.65	90.15	411.00
44'	30.30	92.10	420.00
45'	30.95	94.10	429.00
46'	31.60	96.10	438.00
47'	32.25	98.05	447.00
48'	32.95	100.05	456.00
49'	33.60	102.00	465.00
50'	34.25	104.00	474.00
51'	34.90	106.00	483.00
52'	35.55	107.95	492.00
53'	36.25	109.95	501.00
54'	36.90	111.90	510.00
55'	37.55	113.90	519.00
56'	38.20	115.90	528.00
57'	38.85	117.85	537.00
58'	39.55	119.85	546.00
59'	40.20	121.80	555.00
60'	40.85	123.80	564.00

WEST BASIN @ $11/FT.

24'	20.60	63.10	288.00	31'	26.25	80.00	365.00
25'	21.40	65.50	299.00	32'	27.05	82.45	376.00
26'	22.20	67.90	310.00	33'	27.85	84.85	387.00
27'	23.00	70.35	321.00	34'	28.95	87.25	398.00
28'	23.85	72.75	332.00	35'	29.50	89.70	409.00
29'	24.65	75.20	343.00	36'	30.25	92.10	420.00
30'	25.45	77.60	354.00	37'	31.10	94.55	431.00

Vessel Length	Weekly Rate ($)	Monthly Rate ($)	Annual Rate ($)
38'	31.90	96.95	442.00
39'	32.70	99.40	453.00
40'	33.50	101.80	464.00
41'	34.35	104.25	475.00
42'	35.15	106.65	486.00
43'	35.95	109.05	497.00
44'	36.75	111.50	508.00
45'	37.55	113.90	519.00
46'	38.35	116.30	530.00
47'	39.15	118.75	541.00
48'	39.95	121.15	552.00
49'	40.80	123.60	563.00
50'	41.60	126.00	574.00
51'	42.40	128.40	585.00
52'	43.20	130.85	596.00
53'	44.00	133.25	607.00
54'	44.80	135.70	618.00
55'	45.60	138.10	629.00
56'	46.40	140.50	640.00
57'	47.25	142.95	651.00
58'	48.00	145.35	662.00
59'	48.85	147.80	673.00
60'	49.65	150.20	684.00
61'	50.45	152.60	695.00
62'	51.25	155.05	706.00
63'	52.05	157.45	717.00
64'	52.90	159.90	728.00
65'	53.70	162.30	739.00

DAILY FEES
TRANSIENT MOORAGE

Vessel Length	Rate ($)
Up to 17'	$3.00
18' - 34'	4.00
35' - 54'	4.50
55' - 63'	5.50
64' - 84'	6.50

Current Moorage Rates, Salmon Harbor Moorage, Oregon

Marketing

*Bruce H. McKibbin**

Let me tell you a bit about myself and what I hope to offer you today:

I have been involved with marketing and business organization for service providers for most of my professional life, most recently as a marketing and management consultant working with companies and organizations like yours.

I have found the disciplines of good marketing and good business are transferrable from one industry or company to another.

I am not an expert in your business. For this workshop, I represent your customer. I have been a boat owner for many years and have purchased both permanent and transient moorage and many if not most of the services offered by marinas.

You are the experts in marina operation; I will share with you some principles, strategies, tactics, activities and techniques which you can apply profitably to your business. I also hope to pique your interest enough to develop discussion and interaction within the group and to exchange ideas that will work to make your operations more profitable.

The presentation will necessarily be general — and brief. Most of my comments will be applicable to both permanent and transient as well as to commercial moorage. Don't forget that even if you concentrate on permanent moorage, transients can add incremental revenue and profit to your operation.

We will be talking about markets (defined as — groups of people who possess similar characteristics and who can buy your products and services). Mention should also be made of what are sometimes called your "Publics." Publics can consist of owners, employees, government officials, and the general public. The techniques and communications we will discuss should also consider and are applicable to these publics.

What is Marketing?

First of all it's a great word to use at a cocktail party. Everybody is inclined to accept what you say about the subject, but nobody has the

* McKibbin Marketing, Seattle

same definition. Even marketing gurus can't agree on what the word means. Let me suggest a working definition of marketing: Finding out what people want, providing it for them, and telling them about it.

One statement about which nearly all marketers agree is that embodied in what a man by the name of Theodore Levitt called *The Marketing Concept.*: "The business of business is to create and keep a customer."

Often, effective marketing activity is developed through the application of common sense solutions to business problems when those solutions relate to customer desires and solve customer problems.

An easy way to remember some of the basics of marketing is by reference to what is referred to in marketing textbooks as the marketing Mix — the four P's:

- Product (and services)
- Place
- Promotion
- Price

Let's take a closer look at the four P's.

PRODUCTS AND SERVICES

What do you and your marina have to offer — from your point of view?

- docks, slips and dry storage for temporary and permanent rental or lease
- gas, diesel, oil, water, electricity, pumpout, security
- ice, groceries, fishing gear, chandlery, toilets, showers, restaurants and bars, washers and dryers
- haulout
- repairs
- diving services
- charters
- boat sales
- shopping
- RV accommodations

Most of us view our business and its products or services as "Features or Advantages" — the things we have to sell. How does your customer or potential customer view what you offer?

- The place where my boat is, or can be located
- A place which is convenient to my planned boating activities

- A place which has the facilities, supplies and services I need, or expect to need, either at the location of my boat, or conveniently nearby
- A place which is clean and attractive
- A place whose staff is friendly, courteous, and helpful
- A place where I know my way around
- A place which says in a lot of ways "We're here to help you. YOU, the customer are the most important person in our business, YOU are not an interruption of our work — YOU are the purpose of it!."

The customer views what you have to offer in terms of perceived benefits of value to him or her as contrasted with what else is available.

There is often a great disparity in perception between what we feel we have to sell and what our customers feel they want to buy.

PLACE

Where are you located? Who goes there? Who should go there? and why? Elmo Statler in speaking of the hotel business said there are three essentials for success — location, location, and location.

- Since boats, boat owners, and the markets they represent are transient, the occupancy rates of the places the boats are kept are subject to change.
- Marinas in some locations are full now and others need business. Seattle may be a "hot" market at this time, while Olympia slips go begging, but all are affected, to some extent, by the laws of supply and demand in specific geographical areas. The situation can, and will, change.
- Unless you are completely full and expect to be full forever, you can improve the occupancy, revenues, and profits of your marina.
- Does your potential market know about you and what you offer, or do you assume everyone knows the things you know?
- South sound — promote as a destination area, the reason most go North from Seattle is that they don't know what the South Sound has to offer.

PROMOTION

- Do you know your market?
- Does your market know about you? (the things you want them to know)

- Do you promote activities which increase the knowledge about, and perception of, your marina, e.g. Whidbey Island Race Week has brought considerable attention to the Oak Harbor Marina.
- Word of mouth recommendations of your satisfied moorage holders is probably the best promotion you can get and you should stimulate it — ask for it. Additional communication can be provided by cards, newsletters, and information to pass on. Surprisingly, moorage holders may not know much about the services and facilities offered in their own marina.
- Try to get the biggest BANG for the least BUCKS. Get the merchants around you to cooperate in a way that promotes the marina.
- Publicity — develop regular informational releases to trade and consumer media. Editors are eager to get information of interest to their readers, viewers, or listeners. They are not interested in fluff.
- Develop celebrations for yacht clubs and other boating groups.
- Find and promote your niche in the customer's mind. This is called positioning.
- Make yourself easy to find and to contact by land or water. Make it easy to do business with you. Be responsive to requests and questions. Monitor channel 16. I've found many don't and consequently lose transient business.
- Advertise very selectively and objectively.

PRICE

- Are you competitive — and does anybody care? If customers perceive the value to be worth the price, they'll come and stay; if not, they won't.
- Are there any pricing strategies your customers don't like?
- How do customers determine the VALUE of your services? How do they compare you to competitors?

SUMMARY

We've spoken about the marketing concept, how important the customer is to your business and about the generalities of the marketing mix — your Product (or service), Place — (location), Promotion and Price.

The Marketing Concept and definition of the word *Marketing* bear repeating here:

Marketing — Finding out what people want, providing it for them and telling them about it.

The Marketing Concept. The business of business is to create and keep a customer.

Determine not what you want to sell, rather what your customers want to buy — if only they know about it.

Now let's get into some specifics.

Developing a Marketing Plan

What are your markets? A good place to start in this determination is with your present customers. Employ the concept of MBWA, Management By Walking Around — As expressed by Tom Peters, co-author of *In Search of Excellence* and *A Passion for Excellence.* Talk to your customers, get acquainted with them, ask them how they heard about you, and why they moor their boat with you. You may learn some things you don't like to hear — BUT, if you hear complaints, you can do something about them. Who influenced their decision? What do they like and dislike about "their" marina — and make notes!

Do your moorage holders belong to yacht clubs and if so which? — many like to stick together. Consider forming one if the results would benefit the marina.

What boating activities (group) are they involved with? Ask for referrals. Most of us don't like to sell, but this is an easy way to do it with a purpose.

Consider developing an interview format using the six basic interrogatives — who, what, why, when, where, and how? If questions contain these words, they can't be answered yes or no. After you have become acquainted, ask for referrals — and follow up!

While you're walking around, take a critical look at your marina. Does it need new paint? Are there appropriate signs and maps to let customers know where facilities are located? (You know, but assume they don't.) Are plantings and other decoration properly maintained?

Check with your employees; they may be hearing things they don't pass on because they don't think you want to know.

Review your records; find out where your customers come from geographically, and demographically; you may find some surprises. If you can, find out what they do for a living, if your records don't indicate that or other answers you find important, maybe your registration forms are in need of revision.

You may find some interesting patterns if you look for characteristics which can be exploited through promotion to get more business.

Talk to boat brokers, get their referrals, and take care of them when they call you or you call them.

What do we call these activities? — *Research.* To be more specific, secondary research — probably the most important type for our use and certainly the least expensive.

We've probably all heard of what is called *Basic Research.* Although the term means looking into the basic nature of things, we want a more directed research effort. Dr. Werner von Braun said "Basic research is what I am doing when I don't know what I am doing." Our own research, unless well thought out and properly directed, often resembles von Braun's definition.

The two types of research we should be concerned with are not frightening and do not need to be expensive. They are: *Secondary Research,* that which is taken from data which has already been produced such as your records, government and industry surveys, other research conclusions which can be adapted for your use, etc.. I'm sure there is a lot of data available to you at this workshop which can be converted to useful information. *Primary Research* is that which is conducted through questionnaires, interviews, etc. to answer specific questions. Some of you may have user groups (perhaps condominium) to deal with. Consider focus groups.

Both secondary and primary research can be quantitative (figures, totals, percentages etc.) or qualitative (gaining thoughts and impressions).

In conducting informal or formal research, you should first decide what questions you want answered, then the best way to get specific or representative answers of direct application to your business.

Now if we have found out who our customers are, what they want, and if we are attempting to provide it — we want to concentrate on Marketing Communications and find the answer to that burning question: How can more of the customers I like best find me?

Let's put it all together and develop a Business/Marketing Plan. It is not difficult to develop, just difficult to get started. If properly done, it will provide a road map, or better yet a *chart,* of where you want to go, and how to get there. (if you don't know where you want to go — any route will take you there).

Not only good for marketing, a plan will help with financing, improvements, sale, or purchase and in communicating with owners, associates, and employees.

How to go about preparing a plan?

- Review the subject areas in the plan outline (Fig. 1.), give them serious consideration and fill in the blanks!
- Keep it simple!

- Keep it flexible — use a 3-ring binder so you can add and change; don't worry about formality unless you need to show it to someone.

DRAFT BUSINESS AND MARKETING PLAN

Marina Name_____
Address_____

Telephone (___) ___ ____

Date_____, 1988 Revised: _____

COMPANY MISSION, SCOPE, AND OBJECTIVES

SITUATION ANALYSIS
- Assumptions
- Company Organization
- Company Resources
- Market Potentials, Forecasts, Facts
- Market Share
- Service Plan
- Sales History
- Sales, Expense, and Profit Forecasts
- Current and New Opportunities

CURRENT AND/OR PROJECTED MARKETING ORGANIZATION
- Reservations
- Sales
- Promotional/Collateral distribution
- Advertising

MARKETING OBJECTIVES AND STRATEGIES

MARKETING GOALS

MARKETING PROGRAMS (TACTICS)
- Publicity, (trade and consumer periodicals and electronic media)
- Promotion and merchandising
- Trade shows
- Direct mail
- Advertising

SCHEDULES, ASSIGNMENTS

BUDGETS

PROFORMA PROFIT AND LOSS, BALANCE SHEET

CONTROLS

CONTINUITY

Figure 1.

The Decade Ahead

Siting New Marinas

*Jeffrey A. Layton**

Obtaining regulatory approval for a large new marina within the Puget Sound region is one of the most difficult environmental and land use undertakings that a developer will ever encounter. For new marina projects which require dredging, breakwater construction or fill within the tidal zone, the permit process often requires 3 to 5 years to complete, and can cost several hundred thousand dollars. If the project is located on a shoreline where local citizen opposition is strong, or occupies a water area which is also utilized by other commercial interests, the permit process can be further prolonged by lengthy permit appeals. Even when the final permits are upheld and issued, and the project is ready for construction, the threat of litigation to stop the marina is ever present.

A recent example of how difficult the marina approval process can be is best illustrated by the Elliott Bay Marina project. Final Corps of Engineers approval for this 1,200 berth small craft harbor, located near downtown Seattle, required eight years to complete and cost the developer in excess of one million dollars. Unfortunately, just as construction for the project began, local Indian tribes sued in Federal District Court to overturn the Corps permit. An injunction halting construction was subsequently issued and the project is now mired in a variety of legal problems, all of which have indefinitely delayed completion of the facility.

Despite the difficulties in obtaining approvals for new marinas, the interest by both public and private waterfront developers remains strong. Much of the interest centers on providing saltwater moorage within close proximity to the Seattle-Everett area. Moorage demand studies conducted by the author and others indicate that many boaters in the greater Seattle

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* Layton & Sell, Inc., P.S., Consulting Coastal and Civil Engineers

region desire quick and easy access to marine waters without having to confront the Lake Washington Ship Canal lock system.

It has also been the experience of the author that, during the spring and summer seasons, many Seattle-based boaters prefer to moor their boats in marina facilities which provide easy access to the San Juan Islands. The Anacortes area is particularly popular as demonstrated by the large number of marina facilities located on Guemes Channel, Fidalgo Bay and Flounder Bay. Because of the continuing trend toward having separate summer and winter moorage facilities for the same boat, as well as the general increase in the boater population, the author expects that the demand for new marinas within both the Seattle-Everett region and the Anacortes area will remain strong.

To meet the demand for new moorage facilities, developers will likely find it necessary to work with potential marina sites that are less than desirable. Because of past development activities, naturally protected shoreline areas that would make ideal marina sites have already been developed with marinas or other water dependent facilities, and hence, offer little development potential. As a result, developers will be forced to evaluate new project sites that are located in natural areas where no development activity has occurred. This, in turn, raises the obvious problem of complying with the many rigid local, state and federal environmental regulations and laws that are typically designed to protect pristine shoreline areas from excessive development. Several unsuccessful attempts to obtain permits for new marina facilities in the southern end of Fidalgo Bay illustrate this problem.

In addition to complying with environmental regulations, many shorelines which might be capable of supporting marina development contain physical obstacles which hinder access. For example, much of the nearshore uplands between Seattle and Everett are already heavily developed with expensive single family homes. Thus, finding a site which will not interfere with existing residents is difficult. Also, steep bluffs in excess of a hundred feet high border many undeveloped shoreline areas, presenting formidable access problems for marina development. In addition, much of the undeveloped shoreline along eastern Puget Sound borders directly on the region's major north-south rail link, creating another barrier to marina development. Finally, the potential for interfering with commercial fishing interests, either directly by construction of the marina

or indirectly by increased boating traffic generated by the new facility, is becoming an increasingly difficult impact to mitigate.

From the above discussion it is apparent that developing new marinas in the Puget Sound region will be a difficult and risky venture. Despite the many obstacles, it is the author's opinion that new marina development will continue to occur. The key to obtaining project approval, however, will be in locating marinas at sites that minimize environmental impacts.

To aid potential developers in siting new marinas, the following discussion concentrates on key engineering and environmental design criteria that should be considered during the site selection process. Methods to assist in the early identification of potential impacts for marina development, accompanied with a variety of coastal engineering and biological mitigation measures are provided.

Marina Development Impacts

Development of new marina facilities in Puget Sound typically involves a variety of construction and operational activities, which, if not properly mitigated, can result in significant long-term adverse impacts to the surrounding shoreline areas. Examples of major adverse impacts which result from marina development include:

- Modification to shoreline areas which create barriers or otherwise interfere with existing migration patterns of anadromous fish.
- Destruction of existing intertidal and subtidal habitat important to anadromous and marine fish, shellfish, birds and other marine life resulting from moorage basin dredging, rubblemound (rock) breakwater construction and in-water filling for the creation of new uplands.
- Alteration of existing tidally-generated hydraulic water circulation patterns with resulting degradation of water quality due to marina construction and operation.
- Disruption of existing longshore sediment drift systems resulting from breakwater construction, marina entrance channel dredging and shore defense measures.

- Competition for the use of common waterways between marina generated recreational boat traffic, existing commercial fishing operations and other commercial vessel traffic.

Ideally, a developer would select a site which is not subject to any of the above adverse impacts. In the real world, however, and Puget Sound in particular, there is probably no potential marina site that does not have at least one of the above adverse impacts. Thus, it will be necessary for a marina proponent to design the project to minimize impacts. For potential marina sites located near Seattle, as well as for most other Puget Sound shorelands, providing mitigation to protect the salmon resource will probably dominate the design.

Mitigating Impacts to the Pacific Salmon

Probably the single most important natural marine resource in the Puget Sound region is the Pacific salmon. Regulatory agencies on a local, state and federal level emphasize not only the direct protection of this resource but also the preservation of salmon's existing habitat. The shallow intertidal and subtidal shoreline areas of Puget Sound typically provide excellent feeding and rearing grounds for juvenile salmon and other anadromous fish as they migrate from local rivers and streams to the Pacific Ocean. Many of these shallow shoreline areas also provide excellent locations for marinas and other shoreline development activities. Thus, protection of the salmon resource and preservation of its shallow water habitats will most likely dictate how a proposed marina will be developed.

Specific examples of marina development activities which directly affect the Puget Sound salmon resource are described below:

- Moorage basin dredging and construction of bulkheads, shore attached rubblemound breakwaters and other coastal structures common to marinas often will force juvenile salmon away from their natural shallow water habitat into deeper water where they are subject to predator attack. Similarly, construction of marina breakwater structures that project out into the water can alter migration patterns of some species of adult Pacific salmon as they return to Puget Sound from the ocean.

- Dredging and filling within the intertidal and shallow subtidal environments for marina development often destroy existing habitat important to juvenile salmon.
- Construction of rubblemound breakwaters, in combination with dredging of shallow aquatic lands, can alter existing tidally induced water circulation systems. If these alterations result in a significant reduction of water movement, the existing water quality conditions vital to juvenile salmon and other marine life may be degraded.
- Placement of marina wave protection structures that block natural littoral drift of nearshore sediments can result in shoreline changes which either cover over, or erode nearshore aquatic environments important to juvenile salmon.

Coastal Engineering Design Mitigation Techniques

When planning a marina, or any other port or shoreline development, the designer should always keep in mind that the proposed project can have a profound effect on the local shoreline environment as illustrated by the above discussion regarding salmon in Puget Sound. By identifying potential adverse shoreline development impacts early in the marina planning process, a designer can reduce or eliminate these impacts by incorporating specific mitigation measures into the project's design.

For Puget Sound marina development, a variety of coastal engineering mitigation measures, primarily oriented to protecting juvenile salmon, can be utilized during the design process to expedite regulatory review. Specific examples illustrating various coastal engineering mitigation techniques are described below (from Layton, 1987):

SHORELINE STRUCTURES

Where possible avoid the placement of vertical wall structures, such as bulkheads and seawalls, in nearshore environments which, during high tides, force juvenile salmon into water depths greater than a few feet. If vertical structures are required for functional or economic reasons, place rock riprap at the base of the wall with slopes no more than 1.5 horizontal to 1 vertical. The openings between the rock provide cover for salmon as they move along the wall, eliminating the need to venture into deeper water.

MARINA HYDRAULIC CIRCULATION

For backshore marinas, which are usually dredged from low-lying areas located landward of the mean high tide level, the designer should take special care in the moorage basin plan to provide adequate internal hydraulic circulation. By utilizing a relatively narrow marina entrance channel in combination with curvilinear moorage basin configuration, excellent water circulation can be established within a backshore marina.

SALMON MIGRATION CORRIDORS

For foreshore marinas, which are constructed seaward of the mean high tide level, the designer should provide a salmon migration corridor along the project shoreline. During most tide levels, the corridor should provide an unrestricted pathway for juvenile salmon to swim parallel with the natural shoreline. The corridor will allow juvenile salmon to pass through a project site with a minimum of disturbance.

FLOATING BREAKWATERS

When designing wave protection for foreshore marinas where wave conditions are not severe, the use of floating breakwaters should be considered. Floating breakwaters allow the free movement of water and marine life under the structure, and eliminate the destruction of bottom habitat that is common to rubblemound breakwater construction. A typical limiting wave condition for conventional floating breakwater construction in Puget sound is a significant wave height of around three feet in combination with a wave period of no more than three seconds.

VERTICAL WALL BREAKWATERS

When floating breakwaters are not appropriate for a foreshore marina site, the use of vertical wall breakwaters should be considered. Vertical wall breakwaters constructed of timber, steel or concrete result in minor disruption to the bottom surface and generally do not harm existing habitat. Water circulation openings can also be provided under the main vertical face of the breakwater to allow free movement of tidal waters into and out of the marina. This helps to maintain adequate circulation within the marina's moorage basin.

A few precautions, however, must be taken when locating vertical wall breakwaters in shallow coastal areas. First, vertical wall breakwa-

ters are generally effective for significant wave heights between six to eight feet. Where larger height waves and/or very long period waves are possible, more substantial breakwater protection, such as rubblemound, may be appropriate. For sites that have the potential for breaking waves to occur at the vertical breakwater, the designer must strengthen the entire breakwater system to resist the resulting dangerous high impacts loads. Also, if the vertical breakwater contains circulation openings, care must be exercised in the sizing and placement of the gaps to prevent excessive wave energy form being transmitted into the moorage basin. Finally, as with any vertical wall structure placed in the coastal zone, the designer must consider the secondary impacts of reflected wave generation. Vertical wall breakwaters will reflect most incident wave energy. This incident wave energy can be redirected toward adjacent shoreline areas which did not previously experience wave action. The use of baffles or wave absorbers in the breakwater's design may be necessary to mitigate reflected wave impacts.

RUBBLEMOUND BREAKWATERS

Where wave conditions require the construction of a rubblemound breakwater to protect a marina facility, these rock structures should be located offshore in deep water. The flanks of the rock breakwater can be angled toward the shore, but should not be directly connected with the uplands. By eliminating the shore connections, a salmon migration corridor, oriented parallel with the shoreline, can be maintained. Where wave conditions warrant, floating breakwaters and/or vertical wall breakwaters may also be used to protect the flanks of the marina from wave action.

SEDIMENT BYPASSING

Where design situations require the permanent disruption or blockage of longshore sediments, the marina designer should consider the use of sediment bypassing for downdrift beach nourishment. Sediment bypassing consists of periodically removing accreted sediments, typically sand and gravel, from shoreline depositories and mechanically transporting these sediments to downdrift beach areas where they are reintroduced into the littoral drift system. By artificially transporting sediments around a marina's entrance channel or protective breakwater system, the natural

beach process, both updrift and downdrift of obstructions, can be maintained.

Habitat Replacement and Enhancement Mitigation

In addition to the engineering design procedures described above, there are a variety of non-structural techniques which a marina designer can employ to help offset the adverse impacts to natural habitat which result from marina construction. Although these techniques are primarily developed to enhance habitat for juvenile salmon, many also benefit a variety of marine flora and fauna. Four techniques most frequently used in Puget Sound marina development are described below (from Cooper, 1987):

SUBSTRATE MODIFICATION

This technique includes the use of imported sand, gravel, cobble and/or boulders to cover over dredged areas or otherwise marginally productive areas. The purpose of these materials is to provide improved substrate which will promote the growth of algae and other plant assemblages that support marine organisms which juvenile salmon prey upon.

CREATION OF INTERTIDAL BEACH ENVIRONMENTS

This technique results in the creation of new intertidal habitat by either upland or shoreline excavation, or in water filling. The purpose of this mitigation measure is to replace existing intertidal beach environments which may be lost through dredging or filling operations.

EELGRASS TRANSPLANTATION

This techniques involves the relocation of eelgrass plants from existing sites to other areas for the purpose of establishing new eelgrass beds. Eelgrass beds provide excellent cover and support food organisms for juvenile salmon and other marine fish. They also provide important nursery habitat functions for juvenile Dungeness crab.

ESTABLISHMENT OF NEW SALT MARSH COMMUNITIES

This technique involves the establishment of new marsh communities in the upper level of the tidal zone. The purpose of creating new saltwater marshes is to mimic estuarine marshes in both appearance and function.

These marsh areas provide habitat for juvenile salmon during high tides, as well as support other marine life including crabs and birds.

Mitigating Marina Operation Impacts

The mitigation techniques described above primarily relate to coastal engineering design criteria and aquatic impacts resulting from marina construction. However, once a marina has been constructed, there are a number of potential operational impacts which can have adverse consequences if not properly addressed during the planning of the marina. Typical examples of marina operational impacts include: conflicts between marina boaters and other user groups using the same water; pollution of the moorage basin by boats moored in the marina; and, accidental spills of petroleum products from marina fueling operations.

As with aquatic mitigation, there are number of techniques which a marina developer can employ to help mitigate operational impacts. Descriptions of a few of these techniques are provided below (refer to Layton, 1987, for additional details):

BOAT TRAFFIC CONFLICTS

In order to minimize potential conflicts between marina boaters and other users of a common waterway (i.e., commercial fishermen, ferry boats, commercial ships and military vessels), the marina should be located a sufficient distance away from these activities so as to provide plenty of maneuvering room for the recreational boater. Usually, marina boaters can avoid conflicts with commercial boat traffic if given sufficient room to operate their craft. If it is not possible to provide a large setback from commercial activity, then it is recommended that the marina provide a series of boater safety aids and educational programs to make it clear to the marina boater that potential conflicts can occur. Examples of mitigation measures used to limit boat traffic conflicts include the following:

- The marina should provide readable, well-located and adequately illuminated signs throughout the facility which notify boaters about potential boat traffic conflicts.
- The marina can provide a short range AM radio station which transmits a continuous broadcast notifying boaters of existing offshore boat traffic conditions. The radio broadcast can provide

recommendations for avoiding conflicts and can provide updates on local weather and sea conditions.

- As a very minimum, the marina should provide educational classes and literature for marina customers to familiarize them with boat traffic conditions in the water near the marina.
- Where commercial fishing operations are conducted adjacent to, or near by a proposed marina, it is recommended that the marina require all boat owners permanently mooring at the marina to carry adequate liability insurance to cover damage to nets. By specifically pointing out that recreational boaters are liable for significant monetary damages if they run over properly deployed fishing nets, as well as incurring major damage to their own boat's running gear, marina boaters can be taught to avoid this potential problem.

SEWAGE DISPOSAL

As a minimum, new marina facilities should be equipped with at least one boat-holding tank pumpout facility. Where a significant number of the berths within a marina will be used by live-aboard boaters, the marina developer may want to consider incorporating a dockside sewage collection and disposal system. Although dockside sewage systems are expensive to construct and operate, the extra costs can be passed on directly to the live-aboard user in the form of higher rental rates.

FUEL PIER OPERATION

Probably the greatest potential source for environmental problems within a marina development is the fuel pier. The risk of fire and explosion, as well as a major petroleum product spill, is always present. However, local and state jurisdictions in the Puget Sound region have established fire protection design requirements and fuel spill prevention measures that provide adequate assurances that fuel piers are safe.

Setting aside a possible catastrophic fire or major spill at a marina fueling pier, the accidental spillage of small amounts of fuel during normal transfer operations can be a low-level pollution source. Puget Sound regulatory agencies recognize the chronic fuel pier spillage problem and are beginning to require special mitigation. As a minimum, fuel piers are required to maintain on-site special absorbent materials which can be used to soak up small spills. In some cases, new fuel piers are required to

provide a self-contained fueling float that completely encircles a marina boat during fueling operations. If an accidental spill occurs, the spilled product and boat will be isolated from the marina basin, preventing the dispersion of the surface slick. The containment system prevents a boat from departing until the spill is cleaned up.

Summary

Developing new marinas in the Puget Sound region is a difficult and risky process. To aid in the marina site selection process, there are two main factors which potential developers should address: (1) during the early stages of the site evaluation process, identify all major potential adverse impacts which could occur from both construction and operation of the marina, and (2) determine if specific engineering and environmental measures can be incorporated into the project's design to mitigate the potential impacts. Examples of mitigation measures which may be applicable for potential marina sites include: (1) utilization of coastal engineering design techniques to protect the marina from wave action, (2) the use of habitat enhancement measures to replace or create new biological resources that will compensate for habitat which may be lost as a result of marina construction and (3) incorporation of specific operational procedures to limit the impact of marina activities on adjacent waterways.

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Moorage Market Outlook for Western Washington

*Robert F. Goodwin**

Recreational Fleet Size and Characteristics

In order to predict the additional amount of moorage that will be needed to satisfy future demand from the state's boaters, we need information that is simply unavailable in Washington State. The size of the recreational boating fleet is still an unknown quantity, partly because of the poor compliance by boaters with Washington's boat registration program, and partly because of the way registration records are maintained by the Department of Licensing (DOL)[1]. DOL officials maintain that boater compliance has improved, but they concede that the compliance rate is far from one hundred percent of the "registerable" fleet.

Table 1 reveals the problem faced in attempting to interpret DOL data: While there were almost 250,000 vessel registrations maintained on-file by DOL in September 1988, only 166,601 of these (67%) had current registrations (i.e. 1989 expiration dates). Obviously, many of the remaining 82,066 vessels are afloat, moored, or stored somewhere in the state, and equally obviously, some have been sold out-of-state, scrapped, or otherwise disposed of; but how many vessels fall into each of these categories is a matter of conjecture.

The fleet information reported by the U.S. Coast Guard based on data provided by the state shows wild fluctuations since 1982, the first year that the state assumed responsibility for registering pleasure craft pursuant to the federal Boating Safety Act (see: Table 2.). The author's estimate of

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* Coastal Resources Specialist, Washington Sea Grant Marine Advisory Services

1 Department of Licensing, Registration and Title Control maintains one, constantly-updated boat registration file that cannot easily yield annual fleet totals, annual increments to the fleet, or numbers of vessels scrapped or sold out of state — information essential for understanding moorage requirements. More discouraging is the fact that the department no longer maintains a separate count of boat trailers, historically one of the most reliable sources of fleet information; these data are now aggregated into the category of "Utility Trailers."

the fleet size in 1983 is included for comparative purposes. The author's figure is forecast by an econometric model and is based on historical DOL boat trailer registrations and a 1978 Washington Sea Grant boating household survey which revealed the percentage of boats "normally

REGISTRATION EXPIRATION YEAR	NO. REG'D.[a]
<1987	34,086
1987	16,598
1988	31,382
1989	166,601
All Yrs.	248,677

Table 1. Washington State Boat Registrations, Sept., 1988
[a] Source: Washington State Department of Licensing, Registraton and Title Control

trailered." Clearly, except in the anomalous case of 1984, the reported USCG data reflect a serious underestimate of the state's smallcraft fleet. Whether boater compliance with Washington's registration law is improving or worsening over time cannot be ascertained from USCG data.

YEAR	USCG[a]	AUTHOR'S ESTIMATE[b]
1983	135,642	206,163
1984	253,980	—
1985	125,707	—
1986	142,011	—
1987	159,567	—

Table 2. Recreational Smallcraft Registrations Washington State, 1982-1987

[a] U.S. Department of Transportation, U.S. Coast Guard, Boating Statistics 1984, 1985, 1986, 1987. Washington D.C.

[b] Goodwin, Robert F., Recreational Boating in Washington's Coastal Zone: The Market for Moorage. Institute for Marine Studies, University of Washington, Seattle. May, 1982.

Until boater compliance approaches 100% and DOL begins to maintain separate annual registration files, the kind of information most useful to the moorage industry will continue to be unavailable. This information would describe the annual net change in the composition of the fleet: *that is, the number and kind of vessels appearing for the first time each year, less those that disappear from the state's waters during the same year.*

Reported by county in which the vessels are moored, this information would give a good indication of the number and kind of new marina slips in demand. Additionally, we could learn more about the pressures placed by owners of new trailerable and car-topped boats on launch ramps in each Washington county.

Without such information being available, growth in the fleet — and, hence, demand for moorage — cannot be linked (through mathematical equations) to socioeconomic characteristics (age, income, number of households, etc.) of the population that buys boats. We do know from previous research, however, that boat ownership is strongly correlated with the number of households in the state and those households' incomes. Where either one or both of these factors are growing, boat ownership grows too.

Growth and Change in Western Washington

CORE AND PERIPHERAL REGIONS

Table 3 shows how county population has changed over the the eight years from 1980 to 1988 and how it is expected to change between 1988 and 1995. For clarity, counties are ranked by their absolute population growth (decline) since 1980. What is immediately apparent from this table is that growth has not occurred uniformly throughout the region, but has been concentrated in and around the core metropolitan areas of western Washington — Everett-Seattle-Tacoma, Bellingham,Olympia and Vancouver; King, Pierce, and Snohomish counties combined accounted for over 64% of the state's and nearly 77% of the Puget Sound counties' population increases since 1980. The rural periphery, by contrast, has grown little, if at all. Nor is this disparity expected to change in the future: big population gainers over the past eight years are expected to make large gains in the next seven, while most of the losers will lose more.

CONSEQUENCES FOR MOORAGE DEMAND

Demand for *homeport* moorage, then, has grown and is expected to grow along with the expanding population in Puget Sound's metropolitan counties, but the surrounding rural counties of the Olympic Peninsula, Columbia River, and particularly the San Juan Islands, will also feel the effects of increased boat ownership in the urban core regions: It is in these rural counties that urban boaters cruise and fish during the prime boating months, and it is here that they seek *transient, temporary and seasonal moorage.*

Table 4 reveals the consequences of these divergent moorage demands, again at the county level. Counties are ranked according to the "spread" between peak (summer) and off-peak (winter) marina occupancy

County	1980 Pop'n	1988 Pop'n (Estimate)	1995 Pop'n (Forecast[a])	Change 80-88 #	Change 80-88 %	Change 88-95 #	Change 88-95 %
King	1,269,898	1,413,900	1,510,670	144,002	11.3	96,770	6.8
Snohomish	337,720	409,500	469,523	71,780	21.2	60,023	14.6
Pierce	485,667	547,700	578,628	62,033	12.7	30,928	5.6
Kitsap	147,152	177,300	191,372	30,148	20.4	14,072	7.9
Thurston	124,264	149,300	173,272	25,036	20.1	23,972	16.0
Clark	192,227	214,500	238,223	22,273	11.5	23,723	11.0
Whatcom	106,701	119,100	130,224	12,399	11.6	11,124	9.3
Island	44,048	53,400	64,082	9,352	21.2	10,682	20.0
Skagit	64,138	70,800	76,477	6,662	10.3	5,677	8.0
Mason	31,184	36,800	42,099	5,616	18.0	5,299	14.3
Clallam	51,648	54,400	58,485	2,752	5.3	4,085	7.5
Jefferson	15,965	18,600	19,747	2,635	16.5	1,147	6.1
San Juan	7,838	9,600	9,344	1,762	22.4	(256)	(2.6)
Pacific	17,237	17,600	16,826	363	2.1	(774)	(4.3)
Skamania	7,919	8,000	8,165	81	1.0	165	2.0
Wahkiakum	3,832	3,500	3,417	(332)	(8.6)	(83)	(2.3)
Grays Harbor	66,314	63,400	65,513	(2,914)	(4.3)	2,113	3.3
Puget Sound	2,579,522	2,941,300	3,193,699	361,778	14.0	252,399	8.5
Coast & Col. R.	394,230	426,100	462,368	31,870	8.0	36,268	8.5
Other Wash.	1,158,600	1,197,600	1,284,964	39,000	3.3	87,364	7.2
State Total	4,132,353	4,565,000	4,941,031	432,647	10.4	376,031	8.2

Table 3. Washington State Population Change, 1980-88 and Forecast, 1988-95, by County

Source: State of Washington, Office of Fiscal Management, Forecasting Division. "1988 Population Trends for Washington State."

[a] County population forecasts made in July, 1986

rates (See column on far right of table labeled "Differ. %".) *Caution: Since the marinas that chose to respond to the Washington Sea Grant market survey were "self-sampled," the results should not be used for numerical estimates of unmet moorage demand, or unfilled moorage capacity in any one county. Rather, the data shown in Table 4 should be viewed only as indicators of market conditions extant during 1987.*

County	# Slips Total	# Slips Surv'y'd	% Slips Surv'y'd	# Occup'd Peak	# Occup'd Off-Pk	% Occup'd Peak	% Occup'd Off-Pk	Differ. %pts.
King	7,656	5,310	69.4	5,078	4,992	95.6	94.0	1.6
Pierce	3,186	1,946	61.1	1,922	1,824	98.8	93.7	5.0
Snohomish	3,708	4,155	112.1	3,841	3,421	92.4	82.3	10.1
Jefferson	1,142	1,142	100.0	1,022	892	89.5	78.1	11.4
Skagit	3,131	2,325	74.3	2,294	1,987	98.7	85.5	13.2
Grays Harbor	1,165	1,000	85.8	650	500	65.0	50.0	15.0
Island	455	413	90.8	400	336	96.9	81.4	15.5
Whatcom	3,633	2,568	70.7	2,748	2,327	107.0[a]	90.6	16.4
Thurston	1,473	1,420	96.4	946	680	66.6	47.9	18.7
Cowlitz	262	222	84.7	222	177	100.0	79.7	20.3
Clark	395	395	100.0	383	289	97.0	73.2	23.8
Kitsap	2,651	1,431	54.0	1,353	1,004	94.5	70.2	24.4
Wahkiakum	100	76	76.0	64	45	84.2	59.2	25.0
Clallam	1,473	827	56.1	825	557	99.8	67.4	32.4
Mason	358	217	60.6	192	117	88.5	53.9	34.6
San Juan	1,855	1,293	69.7	1,141	510	88.2	39.4	48.8
Pacific	1,657	1,412	85.2	1,412	432	100.0	30.6	69.4
State Total	35,103	26427	75.3	24,679	20,189	93.4	76.4	17.0

Table 4. Marina Occupancy Rates in Western Washington Counties, 1987/88

Source: Washington Sea Grant Marine Advisory Services Moorage Market Survey of 140 marinas conducted between Dec. 1987 and Mar. 1988.

[a] Rate exceeds 100% due to over-capacity utilization of one large public marina

High, year-round occupancy rates are seen only in the fast-growing urban counties of the east shore of central Puget Sound — King, Pierce, and Snohomish. High peak-season occupancy rates and high numbers of off-season vacancies show up in largely rural counties contiguous to the most popular rural cruising and fishing waters — San Juan Islands, Hood

Canal (Mason, and parts of Kitsap and eastern Jefferson), Lower Columbia River (Wahkiakum and Pacific), the Strait of Juan de Fuca (Clallam and the western part of Jefferson), and, to a lesser extent, in north-central Puget Sound (Island, Skagit, and Whatcom). High year-round vacancy rates beset Grays Harbor — where changes in the allocation of ocean salmon fisheries affected both recreational and commercial fishing fleets moored at Westport and Ocean Shores. Olympia's Budd Inlet facilities — where a new public facility has not filled as rapidly as planned — also experience high, year-round vacancies.

Moorage Market Limit Rates

Waiting lists for moorage or empty slips at a marina are signals about the market in which the marina is competing and the pricing strategy of the moorage owner or manager. Because of the constant turnover of the boating population, some *frictional* vacancies are bound to occur, even where boaters are found on waiting lists at the same facility. Also, available slips may be of the wrong kind or length for those seeking moorage; long waiting lists for *covered* moorage may coincide with a surfeit of open moorage at the same marina; and there may be a dearth of slips in the 40 - 60 ft range while 26 ft. slips go abegging. Furthermore, the quality and availability of services vary among marinas in the same area and affect the price boaters are willing to pay for slips. Nonetheless, examining moorage occupancy rates at prevailing prices in county or sub-county service areas can provide some reasonable estimates of *market limit rates — the price above which significant vacancies are to be found, and below which significant waiting lists occur*. Table 5 contains the author's best estimates of what these moorage rates were in each county and sub-county region in western Washington in 1987/88. In some cases a *range* of rates is shown; in others a quite specific rate can be ascertained from the data. *Caution: Market conditions change. Marinas operators or investors should conduct their own survey of current market conditions before making decisions about rate changes or expansion of moorage.*

In general market limit rates correspond closely to population-driven demand factors: The highest rates are found in the most populous and fast growing markets in the urban core region (King, Pierce, and Snohomish counties). Rates are softer, year-round, where substantial amounts of new moorage have been built in the last 5-8 years relative to local populations (Whatcom and Thurston counties). High seasonal variations in market limit rates are evident where off-season demand is low — in the rural periphery.

County	1981[1] Peak ($/ft./mo.)	1981[1] Off-Pk. ($/ft./mo.)	1987/88[2] Peak ($/ft./mo.)	1987/88[2] Off-Pk. ($/ft./mo.)
Clark	—	—	$2.50	$1.50
Grays Harbor	<$1.00		$4.50	<$1.00
Island	$2.50-$3.50			
Jefferson	$2.25-$2.50		$2.50-$3.00	$1.50-$1.75
King	$4.50-$5.00			
Lake Union			*$5.50*	*$5.50*
Lake Washington			*$4.50*	*$4.50*
Kitsap	$3.50-$4.00			
Eagle Harbor			*$3.50-$3.75*	*$3.25-$3.50*
Bremerton			*$2.75*	*$2.00-$2.25*
Mason	$3.00-$3.50	$2.00-$2.50	$3.00	$2.00
Pacific	<$1.00		$4.50[3]	<$1.00
Pierce	$3.50-$4.00		$4.00-$4.50	$4.00-$4.50
San Juan	$3.00-$3.50	$2.00-$2.50	$4.50-$5.00	$2.50-$2.75
Skagit	$3.00-$3.50		$3.50+	$2.50+
Snohomish	$2.50-$3.00		$4.00	$4.00
Thurston	$2.50-$3.00		$3.25	$2.00-$2.50
Whatcom	$2.50-$3.00		$2.00-$2.50	$1.50-$1.75

Table 5. Market Limit Rates for Open Wet Moorage, 1987/88

Note: Rates in *italic* are for sub-county areas broken out in 1987, but not 1981.

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[1]Source: Goodwin, Robert F., Recreational Boating in Washington's Coastal Zone: The Market for Moorage. Institute for Marine Studies, University of Washington, Seattle. May, 1982.

[2]Source: Washington Sea Grant Marine Advisory Services Moorage Market Survey of 140 marinas conducted between Dec. 1987 and Mar. 1988.

[3]Peak seaon in Pacific County is short — driven by openings in the ocean sports and commercial troll salmon fisheries.

Pricing Strategies

Just like an unrented motel room, an empty marina slip produces no revenue but consumes debt-service, depreciation, and, operation and maintenance costs. Marina operators, public and private, have found that careful pricing strategies can help fill the seasonal troughs in occupancy of their facilities. For example, where demand for transient and temporary moorage is high in the summer months, more slips can be allocated to such use in summer than in winter; higher returns per slip can be gained from short-term tenants than from seasonal or year-round ones. In other cases, summer seasonal moorage agreements can be used to generate higher revenues in the peak months to offset necessarily lower off-season rates during the slack winter months. Of course, costs — particularly labor — incurred in servicing transient smallcraft are higher than for servicing year-round tenants, and these must be factored into the pricing decision. However, other profit centers in the marina can reap benefits from the visiting boater — fuel sales, boat repair, chandlery, laundromat, coin-op showers, etc. — which may more than offset increased moorage operating costs.

Conclusions

The paucity of reliable information about Washington's recreational smallcraft fleet compromises our ability to forecast future moorage demand. However, changes in the size and distribution of the population in western Washington point towards a continuing trend: Demand for year-round, homeport moorage will continue to overtax the capacity of marinas in King, Pierce and Snohomish counties. Demand in fast-growing urban markets will soon outstrip the available supply of slips in Whatcom, Skagit, Island, and Clark counties, where marinas now operate at or near capacity during the summer season.

Excess year-round capacity in Thurston County is unlikely to fill over the next five years, and chronic underutilization of facilities in Grays Harbor, Pacific (except for a brief summer season) and Wahkiakum counties is likely to persist. In San Juan, Clallam, Jefferson, Mason, and (parts of) Kitsap counties, seasonal divergence in demand for moorage will continue. However, as resident (as opposed to tourist) populations grow, winter vacancies will diminish and facilities will reach capacity earlier and remain at capacity longer in the summer season. It is in these seasonal markets that creative pricing strategies are likely to produce results.

Knowing the market in which a marina operates is key to judging the effects of alternative pricing arrangements for rental moorage. It is hoped that the information presented here will inform the moorage industry in

western Washington on some of the key market characteristics affecting their profitability or economic survival.

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