

Coastlines



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Mariculture in Japan . . . Why Not the U.S.?

by Bruce T. Wilkins, Program Leader in Ithaca

When an area, the size of New York, produces \$100 million worth of seafood through mariculture, it should bring to mind the leading seafood nation, Japan. The culture of marine organisms is big business in Japan, bigger and more heavily subsidized than in the United States. But it is not clear the United States can or should follow the Japanese lead in mariculture.

Upon visiting Japan's fishery as I did last summer, one is quickly struck by the very high prices charged for fish. Fishermen, for example, get a price of \$4 per pound for a one-year-old bluefish-like fish and \$5 for certain 4-5-year-old clams, we were told. Fish is also highly priced when compared to in-store prices for chicken and pork. It is not surprising then that certain fish, which have high value and desirable characteristics such as rapid growth and dense schooling, can be produced economically through mariculture. Indeed, 81 percent or about 200 million pounds of one fish, namely yellowtail, were produced by mariculture in Japan in a recent year; and its production apparently continues to increase.

Seaweed too is reared extensively — 8 billion sheets of one type. Japanese fishermen pay to have their lines seeded with plants. Of course, few in the United States even consume seaweed, but in Japan it's eaten frequently, starting with wrapping one's rice in seaweed at breakfast.

Seafood is ever-present in Japan ranging from 10 course meals composed of only fish or plant products to quick foods like "squid-on-a-stick" — not hotdogs — sold at park stands. Over \$3 billion worth of fish are sold

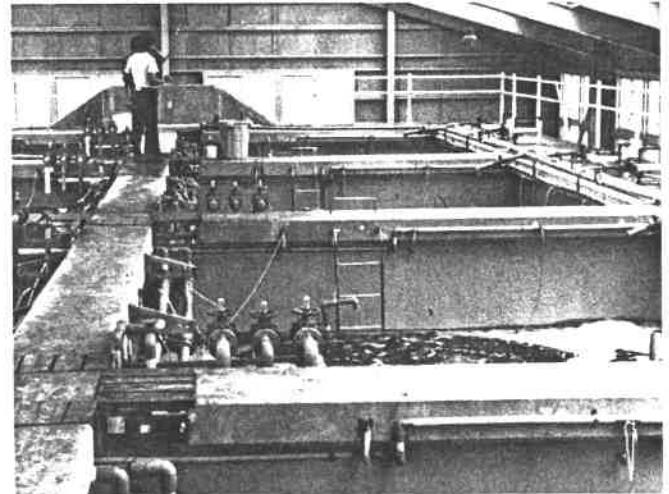
in the Tokyo market alone, so fish is a key part of the economy of this island nation.

Wild Stocking

Recent major expansion in fish culture facilities has facilitated liberating more newly hatched finfish, crabs and other marine species into near-shore coastal waters. Subsidized heavily by the Japanese government, this expansion seems to be related to the curtailment of Japanese high seas fisheries by the United States, Russia, and other nations, and to the reduction of near-shore natural harvests due to pollution and land filling. My inability to speak Japanese made it difficult to discuss this, but I found no references to research documenting the contribution of such stocking to near-shore harvests. Research by Sea Grant and others in New York and elsewhere has demonstrated that to date such stocking is usually of little value in increasing wild stocks.

Where raft or pen culture is successful, it can cause problems similar to those experienced by U.S. agriculture. Japan's cultured pearl oyster industry has suffered from surplus production for several years we were told.

In the United States mariculture



Top: New investment in advanced mariculture systems is evident on the island of Shikoku and in many other parts of Japan. **Bottom:** "Squid-on-a-stick" replaces hot dogs at a Japanese park on Hokkaido Island.

has advanced only modestly for many reasons, a major one being the relative abundance and low price of wild stocks and of alternative, generally more favored foods. Japan's experience demonstrates that high prices can make mariculture an economic success. It also appears that expenditures by the Japanese government may simply appear to aid in solving the man-caused problems of coastal fisheries. A useful description of Japanese mariculture is found in **Factors**

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Sea Grant Studies Disposal of Harbor Dredge Materials

Ocean-going vessels may find waters becoming too shallow at the Port of New York. Unless port managers do something quickly, they may find themselves over their heads in siltation — the buildup of sediments on the harbor floor — at several of the passenger and commercial shipping terminals within the port.

Such a decline in port activities could have grave economic consequences. The Port of New York and New Jersey is the most important port in the nation: thousands of people are employed there, in the comings and goings of over 7000 ships loaded with over 200 million tons of cargo annually.

New rules in 1981

Why not dredge the bottom to keep the port deep enough to accommodate traffic?

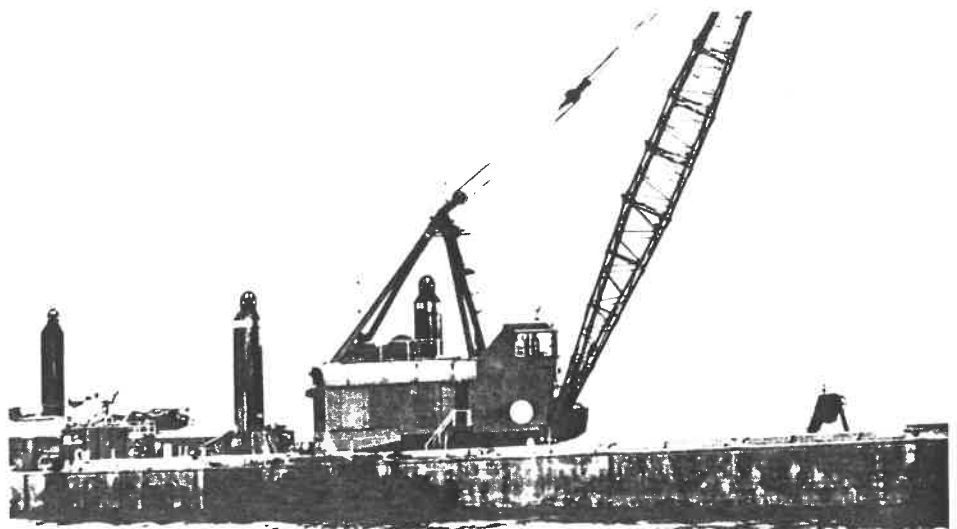
That's been the traditional approach: New York's port managers have been dredging the harbor, then dumping the dredged material out at sea. But increased pollution has raised concern over this approach. And the E.P.A. has stopped issuing many permits for dredging and disposing of dredged material. Starting in 1981 the E.P.A. will outlaw dumping any spoils that fall short of their pollution standards. This will pose a huge disposal problem: approximately 10 million cubic yards are dredged from the port annually; according to E.P.A. standards, as much as 20 percent of this is contaminated. This is enough to cover Manhattan Island to a depth of six inches.

The disposal problem

What can we do with this two million cubic yards of contaminated dredged material?

The U.S. Army Corps of Engineers and the New York Sea Grant Institute are looking for another way to dispose of this material that will not endanger the environment.

One option, devised by the U.S. Army Corps of Engineers back in 1976, involves dumping fine-grained dredged material into pits on the harbor bottom, then capping it with a layer of clean, coarser-grained sand. Sea Grant researchers at the Marine Sciences Research Center, S.U.N.Y. at Stony Brook thought this approach might work well for the lower



bay of New York Harbor.

They had already been studying the environmental effects of mining sand from the harbor bottom to use for fill and construction in the New York metropolitan area. But mining sand leaves large, biologically barren pits — called borrow pits — in the floor of the lower bay. These pits can alter tides, circulation, and wave patterns in the lower bay. Using these pits for disposal of the port's dredged material would solve two problems at once: it would fill in these holes and get rid of contaminated material.

But would dredged material dumped into these borrow pits stay there?

To answer this, with funds provided to Sea Grant by the New York State Office of General Services — the agency that owns the harbor bottom — J. R. Schubel and Henry Bokuniewicz studied what happens to old dredged pits. These pits, they found, fill in naturally with sediments, and keep these sediments confined.

But even as sediment lies on the pit floor, organisms and currents can overturn and mix it. Would these processes stir up buried contaminants?

Looking at the pits in the lower bay filled by natural accumulations of sediment, they concluded, we can assume erosion and organisms will not disturb the material significantly.

So in March of 1979 Sea Grant tested the idea by dumping dredged materials into an existing pit. Most of the sediment, they found, reached the pit and stayed there.

The New York District of the U.S. Army Corps of Engineers decided last July to look at this approach in more

detail together with the New York Sea Grant Institute.

Long-term Solution Sought

This will involve an 18-month field pilot study in which large volumes of dredged material will be placed in a pit in the floor of the lower bay. This program will seek answers to a number of questions:

- how much dredged material will escape from the pit during the operation?
- what will be the form of the deposit?
- will the material remain in the pit until it can be capped?
- can a sand layer be formed over a deposit of fine-grained material by conventional dumping?
- how thick should the cap be to isolate the dredged material from burrowing organisms?
- once emplaced, will the cap be stable?
- what rates of pore water release will occur and what will be the contaminant levels in that water?

New York, and other major ports located in estuaries, must find a long-term solution to its dredged material disposal problem. New Yorkers can't afford to let the silt build up in their harbor and impede shipping. Answers to these questions will help determine the extent of the promise apparently offered by underwater borrow pit disposal. The Army Corps of Engineers expects to decide whether this disposal alternative will work in the Port of New York by mid-1982.

For more information, call Bill Wise at the Albany office of the New York Sea Grant Institute.

Results and Consequences

by Donald F. Squires, Director in Albany

An anthropologist friend of ours, Estellie Smith, from State University College at Oswego has observed, "What you want is results — what you get is consequences." This pithy statement, as so many others like it, sums up a lot of life. And, when it comes to science and technology, results and consequences are a lot of the game.

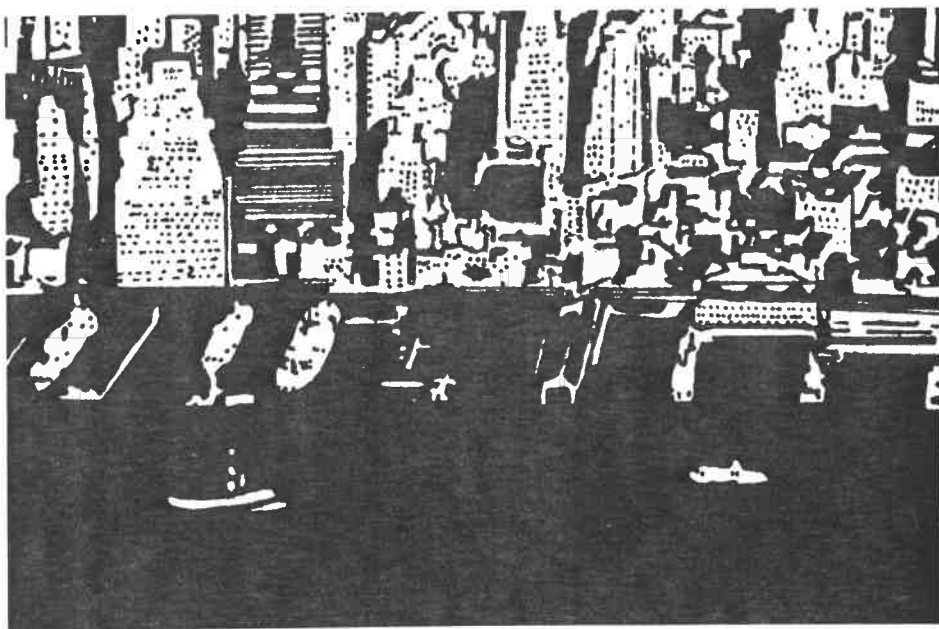
such activity has been the construction of large sewage treatment plants. The *result* of these plants has been the reduction of one kind of pollution and an increase in the oxygen levels in the water. The *consequence* of our pollution reduction program has been the reinvasion in New York Harbor of "gribbles", shipworms and other boring organisms.

wharves, as now constructed of timber, are temporary and generally endure only from fourteen to seventeen years before they are destroyed by worms.

But, in 1953, engineers of the Port Authority were noting that many pilings have been in service for 50-75 years.

The harbor is slowly being invaded by boring organisms and many of the pilings and wharves that had been constructed in those wonderful, gribble-free days are now being subjected to attack. In the recent past, since everyone knew how polluted the harbor waters were, and knew no borers could survive, money was saved and the pilings went untreated; that kind of protection wasn't needed. Until now, that is. As we clean up the harbor, we may very well see the under-pinnings of its magnificent docks and structures slowly crumble.

To the Port of New York this is not very funny. All along the port people haven't been so keen on water quality improvement in the harbor because they were concerned with the consequences, not the results. And the consequences to them are the over two million pilings in the harbor that may have to be replaced — at long last.



Scientists and technologists are taught to be "results" oriented. Their concerns are for the end product of the experiment. They don't know what that will be, but where they go from there will depend a lot on what kind of answer comes out. Consequences, they often think, are something for the social scientists and humanists to worry about. That kind of thinking was once much more prevalent, particularly in the period after the second world war when, being a pretty dedicated lot, scientists weren't very much concerned with the world outside their laboratory. The environmental movement and other social causes since then have changed a lot of that.

In our everyday lives we have some troubles with results and consequences. For the last 20 years all over the country, there has been a movement to clean up the waters, to reduce the impact of pollution. One

Now, for our "freshwater" readers, "gribbles" are crustaceans which, with *Teredo* and other boring molluscs, can reduce a wood piling or a bulkhead plank to a sponge-like unsound entity in no time at all. These creatures are the scourge of the marine construction engineer. Boring organisms had not been in New York Harbor for a very long time. Why? Because the load of sewage dumped into the Hudson, Harlem, and East rivers and the Arthur Kill and other stretches was such that its oxidation pulled out all available oxygen in the water. With the oxygen gone, the little "gribble" and shipworm critters couldn't live. Now they are back.

Once the borers were as much a problem in New York Harbor as anywhere else. The Board of Aldermen in the City complained in 1833:

And whereas it is a fact of great notoriety, that the piers and

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Mariculture in Japan,

Limiting the Development of Aquaculture: A Japanese Experience, a Woods Hole Oceanographic Institute publication, (number 79-47).

The extent of mariculture in Japan and the Japanese approach to educating people who work in fisheries are very different from what we have in the United States. This topic will be covered in the next issue of "Coastlines."

Marinated English

by Linda O'Dierno,
Sea Grant Specialist in New York City

Whether we live five, ten, a hundred or even a thousand miles from the shore, the marine influence has washed into our language. The more we talk, the "saltier" our language becomes.

Maybe you don't swear like a sailor but when you think about it, you certainly talk like one. By necessity, sea language had to be clear and succinct. Often a man's very life depended upon the ability to hear an order over a raging gale and comply immediately. Some common phrases have obvious marine connections: "the coast is clear", "decked out", "take another tack", "batten down the hatches", "going to wrack and ruin", "weather the storm", "down the hatch", and "to get one's bearings". Others have more obscure origins.

Let's listen to an everyday conversation:

"Yes, the scuttlebutt is true. I'm still at loggerheads with my boss on and off. But now that I know the ropes, I feel the situation is improving. As a matter of fact, I feel so good I got carried away and made a reservation for my wife and me at a really posh hotel. It's going to be a surprise for our anniversary, so don't let the cat out of the bag. But I have one project to finish before leaving, and if it's not done, it'll be the devil to pay."

How many nautical terms can you pick out of that simple conversation?

Many of the expressions used had their origins in the days of sailing ships. In some cases, the meanings have shifted and bear only slight resemblance to their origin. In other cases, the meanings reflect their roots.

The "scuttlebutt", for example, was a cask on the deck of a ship used to contain drinking water. Basically, it was the nautical equivalent of the office water cooler. Sailors gathered there to get a drink and gossip, hence, the current use of the term.

A "loggerhead" was a tool used to spread hot tar in the seams between the planks of a vessel. It was a hot and dangerous job, so sailors' tempers were short and the loggerheads were often used as weapons. Today, people "at loggerheads" are in disagreement or quarrel with each other. Because

sailors disliked the chore so much, it was often referred to as the devil to pay.

When novice seamen went to sea on sailing ships, they had to learn the names of hundreds of ropes in the rigging. After a voyage, the captain would mark the sailors' discharge papers: knows the ropes. Nowadays to "know the ropes" means to have an understanding of a situation. When someone is "carried away", he or she is out of control. On sailing ships, when the rigging broke during a storm and was carried away, the helmsman lost control of the ship.

What about posh? That's a common enough word. The passage between England and the East was extremely uncomfortable due to the heat. Luxury accommodations were stamped *Port Out — Starboard Home* since that was the shaded and more comfortable side of the vessel. So anything that is "posh" is luxurious.

Today, to "let the cat out of the bag" means to tell someone something that you weren't supposed to tell. The "cat" back in sailing days was the cat-of-nine-tails, a whip kept in a bag. On board a ship to let the cat out of the bag meant that some miscreant was about to be whipped.

Some other expressions that had their origin in seafaring days are, "stick in the mud", "skyscraper", and "by and large". A "stick in the mud" is simply someone who isn't much fun. In bygone days it had a much more sinister meaning. When English pirates were hung, their bodies were buried deep in the mud so that they would never be recovered. "Skyscraper" originally referred to a ship with a very tall mast that seemed to scrape the heavens. Now that the days of tall ships have passed except for the Bicentennial, the term has been transferred to tall buildings. In many respects, a less romantic notion. "By and large" refers to an instruction to the helmsman of a ship. The helmsman would sail by wind not by a compass heading, and the "large" refers to presenting the broad side of the sail to the wind.

If you think that these examples have been rigged, listen the next time your favorite politician refers to the "ship of state", "taking the helm", "the reefs and shoals" of the economic situation, charting "a new course", "sounding out" a problem, the "groundswell" of public opinion, or the fact that we must all "pull together".

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4-H groups learn first hand about aquatic life from 4

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Sea Grant and 4-H Team Up

by David Greene,
Sea Grant Specialist in East Aurora

With the help of the Sea Grant Extension Great Lakes Network, marine education concerning our inland coastline has made strong advances during the past year. The efforts made by the five states in the network — Minnesota, Wisconsin, Michigan, Ohio and New York — were given a healthy boost at the recent National 4-H agents meeting in Detroit this past November.

The new Renaissance Center in Detroit, symbolizing the rebirth of this Great Lakes city, provided the frame for the picture presented to agents from all over the United States. And at one of the convention's action seminars, the picture was made even clearer. Sea Grant agents from Michigan, Florida and New York spoke to the National 4-H group concerning marine topics and 4-H. Insights on how 4-H clubs could be started and what they can do were given. A lot is happening along the Great Lakes in marine education.

In Wayne County, Mich., Pat Livingston, area marine agent, heads up a 4-H program that may be unique in all of the United States. It is designed to focus community awareness on the resources and heritage of the Detroit riverfront and waterways. It provides skills, training and field experiences to youth in ecology, career opportunities and recreational resources.

In one activity, a 4-H club explores the 37 miles of Wayne County shoreline by asking such questions as: What is being done in this community to improve riverfront recreation facilities? What factors are responsible for eroding shoreline along our county's waterfront? The program is designed to help youth become informed young adults who, in turn, contribute to the well being of their community.

In Ohio, the Sea Grant Education Program now has 23 activities in their collection of Oceanic Education Activities for Great Lakes Schools. These interdisciplinary investigations are for grades 5-9, and were displayed to 4-H agents at the convention's swap-shop session.

Rosanne Fortner of Ohio State has been active in organizing an associa-

tion of Great Lakes educators. Interest has been shown from seven states bordering the Great Lakes.

Those promoting such an organization believe it would improve communication among the many water resource related programs in the Great Lakes area. This improved communication can lead to better programming.

An example of attempts for better communication can be found in Minnesota's new marine education newsletter, **Lacustrine Lessons**. Bruce Munson, a 4-H agent in Minnesota, produces this bimonthly publication filled with lesson plans and ideas. This can now be added to the list of Great Lakes Marine newsletters: Ohio's **Middle Sea**, Michigan's **Upwellings** and New York's **Great Lakes Leader**.

Here in New York about 100 children and their parents got a first hand view of Lake Erie at Erie County's Wendt Beach. At a day-long event right on the lake, they were treated to a series of talks on migratory birds, coastal erosion, aquatic plants and other related topics. Lake Erie's power was in full display in the form of several waterspouts that danced their way across the lake to the wonderment of those in attendance.

Plans for the future include a meeting of Great Lakes Network agents and State Marine Education coordinators in Columbus during the week of January 19th. There, groundwork for further advances in marine education will be mapped out. And as seen in Detroit, marine education and 4-H make a good team.

Editor's Note: For teachers and 4-H agents who are interested in marine education projects along Lake Erie, two Sea Grant publications are available. **Lake Erie Coast: A Field Guide** is an attractive 32 page guide on the lake's history, erosion, pollution and industries. In exacting details, it describes 28 tour sites and activities including maps, addresses, directions, cost, time of day and year to visit, telephone numbers of people to contact and suggestions for projects. **Aquatic Activities for Youth** is a new Sea Grant package designed to meet the diverse needs of youth groups. Included in the series are: aquariums; earthworms; entomology; rope; calculating stream flow; coastal planning, to name a few. For more information, write to David Greene in East Aurora.



4 agents throughout the Great Lakes region.

New York Sea Grant Goes Places

We welcome **Charles O'Neill, Jr.** as regional coastal erosion specialist located at our Brockport office. Chuck, who begins work on January 5, comes to us with training in geological sciences and work experiences in community relations, environmental analysis, and local government environmental units — most recently in Monroe County.

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In September, the New York State Department of State with the help of Sea Grant Specialist **Stephen Lopez** sponsored a "Year of the Coast" tour of New York City's waterfront. Jon Benguat, N.Y.C. Dept. of Ports and Terminals' assistant commissioner for waterfront redevelopment led the four-hour tour that began at the Battery and swung through the Upper Bay, and then to the East River corridor. Some 350 people attended the tour which covered about 75 miles of the city's 580 mile coastline.

Points of interest included in the tour were: the proposed Bay Street landing development project and the Stapleton study area in Staten Island; the Erie Basin commercial development project, Fulton Ferry Landing where new ferry service between downtown Brooklyn and downtown Manhattan is planned, and the River Cafe and Empire Stores projects in Brooklyn; the site of 44th Drive in Queens where a new restaurant with a spectacular view of midtown Manhattan is planned; an alternate energy project near the Hunts Point Terminal Market in the Bronx; and the East 90th Street Fireboathouse Education Center, the Roosevelt Island "new town intown", the \$300 million River

Walk project and South Street Seaport Museum in Manhattan.

As more people become aware of the tremendous diversity and opportunity of New York City's waterfront, as demonstrated on this tour, it is anticipated the effort to improve the waterfront will also increase.

* * * * *

"Although the Coastal Zone '80 Conference is the climax of the '1980 — Year of the Coast' activities, 1980 should actually be the starting point of a new decade of coastal awareness that coastal management, plans and research in the 1970s produced."

This was one of the key messages of the Coastal Zone '80 Conference in November in Florida attended by **Chris Hagerman**, Sea Grant Specialist in our Fredonia regional office.

The key speakers at the conference stressed that although coastal zone management has a definite constituency at this time, it is still not large enough to affect widespread attitudinal changes toward useage of the coast. The speakers went on to say that the decade of the 1980s should be a time for even harder work toward increasing wise useage and conservation of coastal resources.

One interpretation of this message is the need for increased coastal education. Chris Hagerman sees a definite role for Sea Grant. To meet this need Chris will be reaching greater numbers of concerned coastal citizens with the many educational programs and materials that Sea Grant has to offer.

* * * * *

The somewhat unglued fellow holding the plaque is **Mick Voiland**, Sea Grant Specialist from our Brockport office. The more composed individual on the left is **Bob Hartter**, President of the Rochester Trout and Salmon Anglers Club. Bob has just presented Mike with a special citation from the club in recognition of Mike's "effort to advance quality trout and salmon angling in Lake Ontario." The club and Sea Grant have cooperated on numerous programs related to Lake Ontario's salmonid fishery.



More Publications

Tax Guide for Commercial Fishermen, a publication for use in preparing 1980 tax returns is designed for commercial fishermen who are sole providers and who report profit or loss on Schedule C, Form 1040. The 51-page publication will help fishermen become familiar with Federal tax laws as they apply to the fishing business. For example, it explains when and how certain kinds of income are taxed, and when and how certain expenses may be deducted. The booklet is divided into 16 chapters. Each chapter gives tax information on a different aspect of a fishing business. The last chapter gives examples of a fisherman's record keeping system and tax forms. Throughout the guide, there are references of other tax information publications and an alphabetical list of them at the end of the guide. The guide was prepared by the Internal Revenue Service with the assistance of Sea Grant. Write to our Riverhead or Ithaca office for a free copy.

Marine Organisms in Science Teaching, a laboratory-oriented workbook including 42 activities for using living marine organisms in existing science programs, is available from the Sea Grant College Program at Texas A&M University. The activities are intended for grades 4-12, with the level of difficulty progressing with the grade level. The workbook is presented in a discovery type format which includes two sections for the teacher (a pre-lab printed on green paper and post-lab printed on yellow) and a student investigation section. The student sections are designed to allow easy duplication on school copying equipment.

The activities use such organisms as brine shrimp, oysters, ghosts, fiddler and hermit crabs, sea anemones, mussels, barnacles and sponges. Instructions for establishing a living marine materials center within the classroom are included as well as sources for acquiring the organisms. The workbook is available from the Sea Grant College Program, Texas A&M University, College Station, Texas 77843. Please enclose a check for \$4.00 made out to Texas A&M University.

I Want More!

Additional information is available from New York Sea Grant. Please check the publications which interest you and send to your nearest Sea Grant Extension Office. For the following publications, make checks payable to Cornell University:

Coastal Management

- _____ **A Reader in Visual Quality**, D. B. Harper, 1980, 55 pp., \$1.00.
- _____ **The New York City Waterfront: An Analysis of Municipal Ownership and Leasing of Public Land**, Sea Grant Report Series, M. Moss and M. Drennan, 1976, 67 pp., \$1.50.
- _____ **New Prospects for the New York City Waterfront**, Sea Grant Report Series, M. Moss, 1980, 12 pp., \$1.50.
- _____ **Jurisdictional Zones and Governmental Responsibilities**, MESA New York Bight Atlas Monograph 22, P. Marr, 1979, 48 pp., \$4.00.

Marine Science

- _____ **The Impact of Eelgrass on Heavy Metal Mobilization**, Marine Sciences Research Center Special Report 23, W. F. Penello and B. H. Brinkhuis, 1979, 83 pp., \$4.00.
- _____ **Uptake of Cadmium by the Eelgrass *Zostera marina***, Sea Grant Reprint Series, W. E. Faraday and A. C. Churchill, 1979, 6 pp., \$1.00.
- _____ **Chemical and Physical Behavior of Stabilized Scrubber Sludge and Fly Ash in Seawater**, Sea Grant Reprint Series, J. D. Selligman and I. W. Duedall, 1979, 6 pp., \$1.00.
- _____ **A Detailed Magnetic Survey of the St. Lawrence River: Oak Point to Lake Ontario**, New York Sea Grant Report Series, F. Revetta and J. Cardinal, 1980, 31 pp., \$1.50.

Fisheries

- _____ **Status of the Fisheries of the Middle Atlantic Bight Region**, Marine Sciences Research Center Special Report 31, J. L. McHugh, 1979, 56 pp., \$4.00.
- _____ **Freshwater Fishes of New York State**, R. G. Werner, Syracuse University Press, 1980, 186 pp., \$11.95.
- _____ **Pathogenesis of Infectious Pancreatic Necrosis in Atlantic Salmon (*Salmo salar*)**, Sea Grant Reprint Series, R. N. Swanson and J. H. Gillespie, 1979, 5 pp., \$1.00.
- _____ **Shellfish Diseases**, Sea Grant Reprint Series, L. Leibovitz, 1978, 4 pp., \$1.00.
- _____ **An Analysis of Shellfish Sanitation Data**, Marine Sciences Research Center Special Report 30, P. K. Weyl, 1979, 26 pp., \$4.00.

Coastal Engineering

- _____ **Permeable Wall Effects on Poiseuille Flow**, Sea Grant Reprint Series, P. L-F. Liu, 1979, 24 pp., \$1.00.
- _____ **A Suggestion for Anticipating Alternatives in Wave Action on Shores Consequent upon Changes in Water Depths in Harbors and Coastal Waters**, Marine Sciences Research Center Special Report 27, B. Kinsman et al., 1979, 39 pp., \$4.00.
- _____ **An Asymptotic Theory of Combined Wave Refraction and Diffraction**, Sea Grant Reprint Series, P. L-F. Liu et al., 1979, 10 pp., \$1.00.
- _____ **Computer Manual for Calculating Wave-Height Distributions About Offshore Structures**, SUNY/Buffalo-WREE-7904, V. W. Harms et al., 1979, 157 pp., \$1.50.

Dredging

- _____ **Questions About Dredging and Dredged Material Disposal in Long Island Sound**, Marine Sciences Research Center Special Report 28, J. R. Schubel et al., 1979, 136 pp., \$4.00.
- _____ **A Conceptual Framework for Assessing Dredging/Disposal Options in Chesapeake Bay**, Marine Sciences Research Center Special Report 25, J. R. Schubel et al., 1979, 12 pp., \$4.00.

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If you would like to be notified of additional publications by New York Sea Grant, please check the appropriate category and send to the Albany Sea Grant office. Be sure to include your name and address.

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| _____ General information on Sea Grant | _____ Aquaculture, Fisheries, Seafood |
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I Want More, continued

- _____ **Stability and Fate of Dredged Material**, Sea Grant Reprint Series, H. J. Bokuniewicz, 1980, 23 pp., \$1.00.
- _____ **Sediment and the Quality of the Estuarine Environment: Some Observations**, Sea Grant Reprint Series, J. R. Schubel, 1977, 25 pp., \$1.00.

Recreation

- _____ **Financing Boating with Tax Dollars: Trends and Alternatives in New York State**, Sea Grant Report Series, T. L. Brown, 1979, 30 pp., \$1.50.
- _____ **A Comparison of the Use of Cleithra to the Use of Scales for Age and Growth Studies**, Sea Grant Reprint Series, E. J. Harrison and W. F. Hadley, 1979, 5 pp., \$1.00.

Food Processing

- _____ **Canned Fish Bites in Tomato Sauce, Development of Products from Minced Fish**, Booklet 7, R. C. Baker and J. M. Darfler, 1980, 17 pp., \$.75.
- _____ **Reclamation and Treatment of Clam Wash Water**, Sea Grant Reprint Series. R. R. Zall et al., 1976, 66 pp., \$1.00.
- _____ **Preparation and Properties of Dehydrated Clam Flavor from Clam Processing Wash Water**, Sea Grant Reprint Series, Y. Joh and L. F. Hood, 1979, 4 pp., \$1.00.
- _____ **Fish Scales: A Coagulating Aid for the Recovery of Food Processing Wastewater Colloids**, Sea Grant Reprint Series, F. W. Welsh and R. R. Zall, 1979, 4 pp., \$1.00.
- _____ **Changes in Lipid Composition of Cooked Minced Carp (*Cyprinus carpio*) During Frozen Storage**, Sea Grant Reprint Series, J. Mai and J. E. Kinsella, 1979, 6 pp., \$1.00.

Shellfish

- _____ **A Reo-like Virus Isolated from Juvenile American Oysters**, Sea Grant Reprint Series, T. R. Meyers, 1979, 10 pp., \$1.00.
- _____ **Morphology of a Reo-like Virus Isolated from Juvenile American Oysters**, Sea Grant Reprint series, T. R. Meyers and K. Hirai, 1980, 5 pp., \$1.00.

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Riverhead, New York 11901
Tel (516) 727-3910

Sea Grant Extension Program
66 Sheldon Hall
SUNY/Oswego
Oswego, New York 13126
Tel. (315) 341-3042

Sea Grant Extension Program
South Campus, Building H
SUNY/Stony Brook
Stony Brook, New York 11794
Tel. (516) 246-7777

Sea Grant Extension Program
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Cornell University
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