



Marine Resource Bulletin

A Sea Grant Advisory Service

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MARINE ELEMENTARY EDUCATION

The importance of the marine environment to man's survival is becoming increasingly apparent, witnessed by the mounting interest and media

coverage in this area over the past decade. In order to instill an awareness and sense of responsibility for the marine ecosystem in upcoming generations, it is essential that they be exposed early and consistently.

With this goal in mind, VIMS graduate student Ellen Fisher has designed an elementary educational curriculum. Assisted by a member of the VIMS Education Staff and several Gloucester County teachers, Ms. Fisher is field testing this Sea Grant funded program in grades kindergarten through four in the Gloucester County Elementary Schools.

In addition to stimulating student awareness of the marine environment, the program also is concerned with the teacher's attitude and degree of comfort in dealing with marine materials. As a result, the elementary marine ecology "task force" is providing workshops, field experiences and specific information, in addition to a highly detailed lesson plan which assumes no prior teacher experience in the field.

VIMS/Sea Grant Advisory Services assistant, Ellen Fisher, aids a student at Achilles Elementary School in practicing the ancient Japanese art of gyotaku, or fish printing.



"While marine science is a good vehicle for developing the skills of investigation, our ultimate goal is to make the marine environment as real to the students as their 'earthy' experiences," Fisher said. "Using the hands-on, open-ended inquiry approach, the program encourages the students to ask questions, a skill that formerly has largely been developed by the teacher alone."

The program, as designed, may be easily integrated into the routine classroom sessions, and



Student responsibility for the care of marine projects is an important part of the open-ended education process.

includes activities in language arts, music and drama, all with a marine theme. Fisher feels that if elements of the marine environment are revealed through all phases of the educational program, there will be a much better chance of influencing student attitudes about the environment--in this case, the marine environment.

Although Ms. Fisher will conclude this work for her Masters degree in August, the Education section at VIMS Advisory Services plans continuing involvement in the program with Gloucester County schools. In this way it will serve as a model for other areas, and as a vehicle to promote a better understanding of VIMS.



SHELL SHOW

A slide show and lecture on sea shells will be presented May 17 from 7:30 - 9:30 pm. Site of the show is the Peninsula Nature and Science Center, 524 J. Clyde Morris Blvd., Newport News.

The presentation by Charles Arnold, a Richmond commercial artist, will highlight structure, color and design of seashells, and will show how their motifs are repeated in painting, sculpture and architecture.

In addition, Liz Cornell, research specialist with VIMS/Sea Grant Advisory Services, will help the audience examine the Institute's extensive shell collection. Reservations are required and may be made by calling the Center weekdays from 9 am to 5 pm at 595-1900. There is a \$2.00 fee for non-members.



MENHADEN IN '78

The outlook for the 1978 Atlantic menhaden fishery is fair to good. This opinion was expressed by the National Marine Fisheries Service last October to a meeting of the National Fish Meal and Oil Association.

The NMFS estimate was based upon the apparent abundance of juveniles in 1977, the amount of landings in 1977 of 1-year-old menhaden and the overall age composition of landings in 1977. Total harvest in 1978 is expected to equal or better that of 1977.

SEA GRANT PUBLICATIONS AVAILABLE

Manual for Design and Operation of an Oyster Seed Hatchery -- John L. Dupuy, Nancy T. Windsor and Charles E. Sutton. *Book*. Hard-bound copy -- \$10.00, loose-leaf notebook copy -- \$7.50 and softbound copy -- \$5.00.

Tidal Wetland Plants of Virginia -- Gene Silberhorn. *Booklet*, \$3.00.

Biology and Identification of Rays in the Chesapeake Bay -- Joseph W. Smith and J. V. Merriner, Ph.D. *Booklet*, 50 cents.

Rays of the Chesapeake Bay. *Poster*, 50 cents.

Don't Waste That Fish. *Booklet*, 25 cents.

The Pea Crab. *Paper*, 25 cents.

Legal Symposium on Wetlands--An Executive Summary. *Paper*, 25 cents.

Advisory No. 8, "Methods of Handling and Shedding Blue Crabs, *Callinectes sapidus*". *Paper*, 25 cents.

VIMS Sea Grant Advisory Services. *Leaflet*, Free.

Sea Source. *Catalog*, Free.

Spring Resource -- The American Shad -- William Kriete and John Merriner. *Leaflet*, Free.

The above publications can be ordered from the Sea Grant Communications Office, Virginia Institute of Marine Science, Gloucester Point, VA 23062.

THE FISH HOUSE KITCHEN



Most people who like oysters figure there just isn't a bad way to prepare them for eating, whether it be raw, fried, frittered, roasted or in a stew. Here's a slightly different way to treat this gourmet's delight, one that should have special appeal to backyard chefs.

OYSTER KABOBS

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| 1 pt. or 1 12 oz. can oysters | ½ c. cooking oil |
| 1 lg. green pepper, cut in 1" cubes | ¼ c. lemon juice |
| 1 lg. Spanish onion, cut in wedges | 2 t. salt |
| 1 pt. cherry tomatoes | ¼ t. white pepper |
| ½ lb. sliced bacon | |

Thaw oysters, if frozen. Drain. Place in Bowl. Combine oil, lemon juice, salt and pepper. Pour over oysters and let stand 30 minutes, stirring occasionally. Cut bacon in half crosswise. Remove oysters from marinade. Reserve marinade for basting. Wrap each oyster with bacon. Par-boil green peppers and onions. Place bacon-wrapped oysters, tomatoes, green pepper squares and onion wedges alternately on skewers. Broil in oven 5 minutes, turn, baste with reserved marinade, and broil 5-7 minutes longer or until bacon is crisp. May be cooked on grill over moderately hot coals. Serves 6.

OYSTER DEPURATION WORKSHOP

An oyster depuration workshop funded by the Coastal Plains Center for Marine Resources will be conducted at VIMS May 26. According to spokesman Bruce Neilson, the workshop will be aimed at people in the seafood industry and regulatory agencies.

The depuration process involves cleaning up bacterially contaminated oysters by holding them for several days in water disinfected by ultraviolet radiation. This process has been used for many years to cleanse soft-shelled clams in New England. At present, contaminated oysters have to be removed to clean water areas and allowed to purge

themselves for several weeks, then reharvested before they can be consumed.

Many of the techniques to be brought out in the Friday workshop are the result of a completed 3-year oyster depuration project headed by Dexter Haven (Fisheries Sciences and Services) and Frank Perkins (Biological Oceanography), and funded by the U. S. Food and Drug Administration.

The all-day workshop, featuring 10 speakers, will be conducted in the Byrd Hall Conference Room. For further details, interested persons may contact Dr. Bruce Neilson, Department of Estuarine Processes, Virginia Institute of Marine Science, Gloucester Point, VA 23062.



PRESSURE TREATED WOOD

Wood is one of the best building materials for coastal use, including the construction of docks and bulkheads. Not only is it easy to cut and fasten, but individual pieces are light enough to be handled without a crane or other lifting device. Properly designed wooden structures offer the builder shock-absorbing strength, durability and beauty. Being a natural material, wood blends well with outdoor settings, providing a warm, attractive appearance. Despite all its advantages, however, wood is vulnerable to attack by insects, rot and marine animals which can rapidly destroy its strength and beauty.

Modern methods of treating wood with chemical preservatives offer protection from these attacks. Even so, it is important that builders realize strength and durability depend upon the kind of preservative used, the treating process, the depth of penetration and amount of preservative retained in the wood.

Preservatives may be brushed or sprayed on, applied by dipping or under pressure in sealed chambers. In the latter treatment method, a chemical preservative is forced deep into the wood under pressures greater than 125 lbs. per square inch. This is the only recommended process for wood to be used in docks, piers and bulkheads.

Creosote

Wood preservatives usually are classified as

either oils or as waterborne salts. Creosote, one of the oldest preservatives known, is an oil made from distilled coal tar. Creosote effectively protects marine structures from all wood-boring animals except one---the *Limnoria tripunctata*. This borer frequents southern waters and does not normally extend its range into Virginia. While an occasional specimen has been observed in Hampton Roads, representatives of the Norfolk District of the Corps of Engineers and the American Wood Preservers' Institute in McLean, Virginia do not know of any significant damage to wood structures in the Chesapeake Bay from this borer.

Another marine borer, the shipworm, enters wood and then eats away at the inside, undetected until the structure fails. A marine creosote treatment is effective against this animal.

For marine use, southern pine should be treated to retain 20 lbs./cu. ft. of creosote. Utility poles, fence posts and cross ties are usually treated to a 6-9 lbs./cu. ft. retention. Do not expect these timbers to last in salt water. When old utility poles and cross ties are used for bulkheads they often fail. The lesson is clear--for marine use, a retention of at least 20 lbs./cu. ft. is required.

Pentachlorophenol

Pentachlorophenol solutions in an oil solvent have been used as a wood preservative for more than 40 years. A recent innovation has been to use a liquid petroleum gas (such as butane) as the



When treated wood is used for saltwater construction purposes, it soon accommodates seagulls more than man. Pressure treated wood is essential for pilings and bulkheads.

solvent. This new treatment leaves a clean, dry surface that can be glued, painted, finished or left natural.

Pentachlorophenol is not effective against marine borers and should not be used for timbers in direct contact with coastal waters. It may be used as a preservative for parts of piers and docks above the high water line, if it is applied by pressure treatment. The amount of pentachlorophenol retained should be at least .40 lbs./cu. ft., and preferably, .60 lbs./cu. ft.

Chromated Copper Arsenic

Waterborne preservatives, frequently called salts, are particularly well suited for marine structures. The type most frequently used on the East Coast to treat southern pine is chromated copper arsenate (CCA). A marine treatment of CCA is effective against all marine borers with the exception of the pholad. (This borer is most prevalent in southern Florida and is not a problem in Virginia). Wood treated with CCA can be painted or left natural.

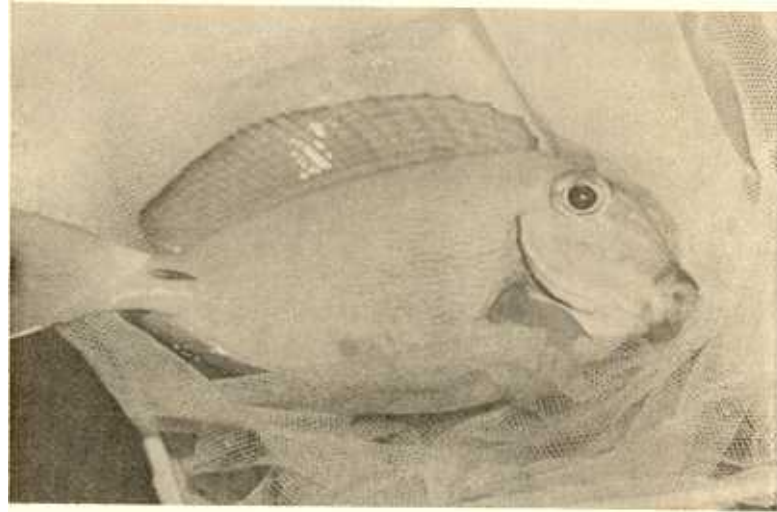
As with other preservatives, the retention is important. For marine use 2.5 lbs./cu. ft. is desirable. Frequently, CCA treated wood has a brand of the American Wood Preservers' Bureau and the letters LP-2 or LP-22 on each piece. LP-2 indicates a retention of .20 lbs./cu. ft. It is recommended for above-ground use and is treated to .40 lbs./cu. ft. retention. Neither preservative is satisfactory for use below the high water line, but LP-22 is acceptable for above-water marine use.

There are several popular trade names for wood that has been treated with CCA and there are different retentions of CCA bearing the same trade name, so it is still important to specify the amount of preservative desired. The recommended retentions for marine use are 2.5 lbs./cu. ft. below mean high water and .60 lbs./cu. ft. above high water and not subject to splash.

Southern pine, an abundant native timber, responds extremely well to pressure treatment and is probably the only species of treated wood available in this part of the country. Since it performs well, there is no reason to look any further for a material for marine use. Additional information on treated wood can be obtained from the American Wood Preservers Institute, 1651 Old Meadow Road, McLean, VA 22101; and the American Wood Preservers, 1625 Eye Street, N.W., Washington, DC 20006.

Adapted from "Guide to Pressure Treated Wood" by Neal Bird, Clemson University Sea Grant Marine Advisory Program.

AQUARIUM TROPICALS IN VIRGINIA




The ocean surgeon, or tang, is a tropical visitor that may be found around the offshore artificial reefs and among the rocky islands of the Chesapeake Bay Bridge Tunnel.

Most Virginians would be astounded to discover that there are tropical fish in waters they normally consider the habitat of spot, croaker, bluefish and striped bass. They'd likely tell you that "tropicals" are what you buy in a pet store along with an aerator, aquarium and brightly colored pebbles.

The fact is, there are several species of tropical "aquarium" fish that find their way to the marshlands of the Eastern Shore and the waters of the Chesapeake Bay each summer. Come winter and cold water, they are gone, since temperature-wise, ours is a marginal habitat for them. Among the species found here are the sergeant major, several butterfly fishes, the ocean surgeon, grunt and nurse shark. The latter may occasionally be taken by bait fishermen.

In most cases, these tropicals arrive here borne on the currents of the Gulf Stream, that warm flow of water that sweeps up out of the Caribbean and flows past the Eastern Seaboard, then out into the North Atlantic. When transported by this current to offshore Virginia waters in the summer, the tropicals make the transition to our warming



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DICK COOK EDITOR

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William J. Hargis, Jr. Director

NEW SEA GRANT FUNDS

Chesapeake Bay waters with little difficulty.

While their tropical homes consisted of coral formations and beds of turtle grass, their adopted Virginia homes are the artificial reefs off the coast, shipwrecks, eelgrass beds, Eastern Shore marshlands and the rock islands of the Chesapeake Bay Bridge Tunnel. All of these habitats afford the necessary requirements of food and cover for the visitors.

Because these species prefer structural or dense vegetative cover to open water areas, they are not likely to be picked up in the seasonal otter trawl surveys of the Bay conducted by the Virginia Institute of Marine Science. About the only way they may be observed is with the aid of SCUBA gear, and even the best efforts on a diver's part might reap a lean reward for time spent. However, careful observation of crevices, caves, rock formations and vegetation beds should turn up a few colorful specimens for the keen-eyed diver.

Representatives of the species present in Virginia's waters during the peak summer months may be seen in the 700-gallon recirculating aquarium that is set up in the Exhibit Room in Maury Hall and maintained by the VIMS Marine Education Center staff at Gloucester Point. 🐟

Two new projects to improve oyster hatchery production are among studies to be supported at VIMS by a \$475,600 Sea Grant from the National Oceanic and Atmospheric Administration. The grant will be supplemented by \$319,200 in state funds.

One project involves development of American oysters resistant to the fungus *Dermocystidium marina* through laboratory spawning and setting. These oysters would be made available to hatcheries as brood stocks whose offspring would be highly resistant to the fungus, especially in the high salinity areas of Chesapeake Bay.

Researchers also will design and test a setting tank for hatchery use incorporating a new type of collector developed in France which protects the young oysters from crab predation.

Other new projects funded by the Commerce Department agency grant include a causal study of large blue crab mortalities occurring in the production of soft crabs. Disease organisms and handling techniques used in the shedding process will be studied. VIMS' Sea Grant scientists also will gather data on tidal inlet-basin systems fringing portions of Chesapeake Bay, to determine the best designs for modification of these inlets and to suggest potential impacts to developers. 🐟

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VIRGINIA INSTITUTE OF MARINE SCIENCE
Gloucester Point, Virginia 23062

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