



# Marine Resource Bulletin

A Sea Grant Advisory Service

Vol. X, No. 1

VIMS, January/February 1978

## YORKTOWN STUDY

Do marshes make effective natural treatment plants for sewage? Will they, in effect, filter out excess nutrients from sewage-impacted waters, thus helping prevent pollution of adjoining waters? Not for very long, according to the results of a year-long study by VIMS Wetlands Research Department.

A 5-member team headed by marine scientists Richard L. Wetzel and Kenneth L. Webb studied the effects of municipal sewage flowing through a tidal marsh near Yorktown, Virginia. According to Wetzel, the unique physical geography of the area lent itself to a comparative study of two similar marsh systems: One natural, the other impacted by sewage. The study was supported by VIMS Division of Environmental Science and Engineering and the U. S. Environmental Protection Agency.

Wetzel explained that Yorktown Creek enters a marsh from the York River, and approximately 50 to 75 meters into the marsh the creek diverges into two branches. One branch drains a watershed which carried sewage from the Yorktown municipal treatment plant for 20 years...up until July 1976. The other branch drains the Colonial Historical Park marsh, an area which has never been impacted by sewage.

"A principal reason for initiating the study was because some researchers have proposed that marshes might effectively act as tertiary facilities for secondarily treated municipal sewage," Wetzel said. "Our specific interest initially was in the response of the impacted marsh to the increase in nitrogen and phosphorus due to the sewage input. Our studies indicated no significant differences in overall vascular plant production or plant community characteristics between the natural marsh system and the one which carried sewage."

One of the reasons EPA was interested in the study when they agreed to help fund it was how the impacted marsh would recover after the sewage was diverted to another system. Wetzel said the study, still continuing on a limited basis to shed light on this aspect, has shown little. "Because our data prior to diversion of the sewage disposal indicated that the marsh was not effective in reducing excess nutrients, we don't expect to see any major change now that it has been diverted. So far, we have not."

One of the reasons some researchers believe that marshes act as effective nutrient sinks is because of the fairly dramatic short-term effects of adding nutrients to pristine marshes. Wetzel says that the plant community reacts initially by exhibiting rapid growth of vascular plants, but only for a comparatively short time. He added that these experiments were generally conducted in marshes impacted with sewage sludge or sprayed sewage for a year or less.

The Yorktown marsh, on the other hand, has been handling a sewage load for 20 years, and had likely reached its saturation point years ago. After



that happened, the marsh "passed on" the excess nutrients.

Water samples taken at the inflow and outflow of the sewage-impacted marsh over two different 24-hour tidal cycles revealed no discernable difference in the amount of nutrients, another indication that the marsh was not acting as an effective filter.

In similar studies from Georgia to Rhode Island, some of the general data afforded by the Yorktown study has been confirmed. The approach to the issue in terms of historical impact and geography was different, but the questions posed were the same.

Since the use of marshes or wetlands in general as disposal sites for municipal sewage is a major management issue, Wetzel suggests that more detailed studies are in order before any judgement can be made concerning either the long term impact or economic benefit of using wetlands in this manner.

#### CONFERENCE/WORKSHOP

**Location:**

Bonhomme Richard Inn  
Williamsburg, VA

**Dates:**

April 27 & 28, 1978

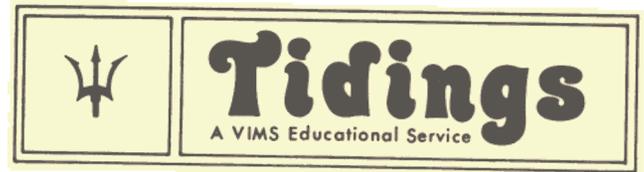
**Subject:**

A two-day workshop on shoreline erosion  
in bays, sounds and estuaries

**Goals:**

- a) To identify, in detail, the magnitude of the problem.
- b) To facilitate transfer of technical information on techniques of erosion control in the circumstances of water bodies with limited fetch.
- c) To provide a forum for the exchange of ideas and experiences between Sea Grant Marine Advisory Service personnel and other advisory services.
- d) To provide marine contractors with a better understanding of the processes, suitable solutions and design guidelines.

*For information and registration forms contact  
VIMS Marine Advisory Service, Gloucester  
Point, VA 23062, (804) 642-2111.*



SUMMER AND YOUNG PEOPLE go together like ham 'n eggs, or if you're from Tidewater, Virginia, maybe it's crabs cakes and flounder fillets. In any event, selected marine education personnel will be working with the YOUTH CONSERVATION CORPS and the VIRGINIA WILDLIFE FEDERATION to conduct summer youth education programs with a definite salt-water flavor.

According to Advisory Services Education Program Coordinator, Lee Lawrence, June 19 - August 11 will see the VIMS installation at Gloucester Point hosting YCC members, and during two additional periods (June 12-16 and August 14-18) emphasis will be on Coastal Awareness Camps sponsored by the Virginia Wildlife Federation.

"The VIMS/YCC camp is nonresidential, except for the week or so we'll spend at the Wachapreague Eastern Shore Lab," Lawrence said. She added that all of the activities would be marine-oriented, such as assisting around the lab, with a work/study program set up for 30 hours of field work and 10 hours of instruction each week.

The 20 students can expect to go on at least one cruise aboard the *Langley*, VIMS' third largest research vessel, with other field activities including ecology studies of selected beaches and marshes.

Following the YCC guidelines for promoting safety and self discipline, while allowing young people to make honest and valuable contributions to conservation work, one of the projects will entail the extension of the nature trail at the Yorktown Victory Center, thereby broadening its educational base, and they may also be involved in beach work projects in other areas. Where necessary, VIMS personnel will assist.

The Wildlife Federation Coastal Awareness Camps will be based at the Wachapreague facility on a residential basis -- one week for youngsters age 12 to 14, and another week for those 15 to 17 years old.

Lawrence explained that activities will include study of beach and marsh ecology, a visit to a barrier island, a working trip aboard a research vessel during trawl operations, and investigation of marine food resources. This last item is sure to appeal --- they'll catch, cook, and eat their own seafood.

Anyone interested in additional information about these programs should write to Lee Lawrence, Sea Grant Education Center, Virginia Institute of Marine Science, Gloucester Point, VA 23062.

# THE FISH HOUSE KITCHEN

*You don't have to go to the far northeast to enjoy salmon, although it is undoubtedly more exciting than getting a can from the grocery store. Long a prized food fish as well as a premier sport fish, salmon may be prepared for the table in a variety of ways. First open the can. Then try one of these recipes, if you like.*

## SALMON SOUR CREAM DIP

Drain and mash salmon. Blend in salt, tabasco, and onion. Fold in sour cream. Chill. Garnish with caviar. Serve with crackers. Makes about 1 pint of dip.

1 lb. can salmon  
½ t. salt  
3 drops tabasco

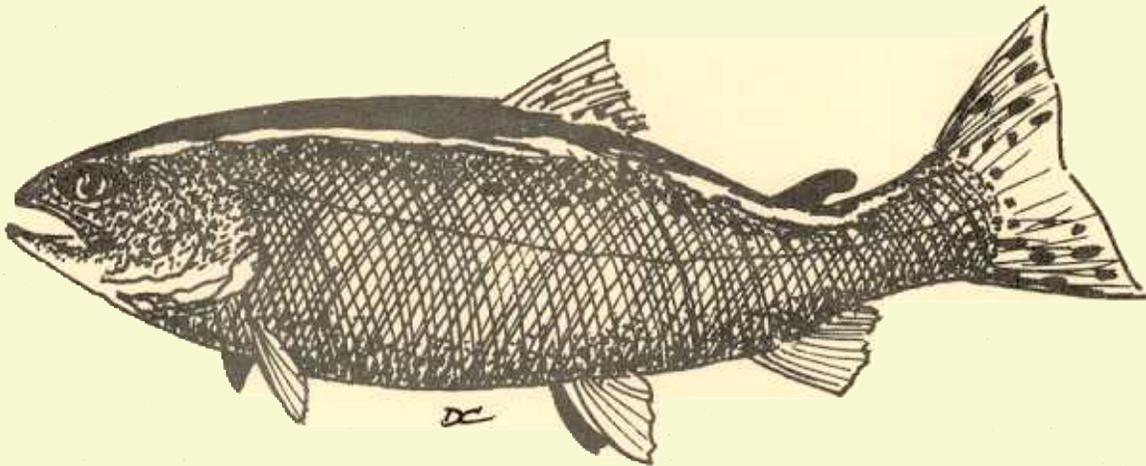
1 c. sour cream  
1 T. drained red caviar  
1 t. grated onion

## SALMON CHOWDER

Drain salmon, reserving liquid. Break salmon into large pieces. Dissolve bouillon cube in boiling water. Cook onion, green pepper, and garlic in butter until tender. Combine all ingredients and cook for 15 minutes or until vegetables are tender. Remove bay leaf. Serves 6.

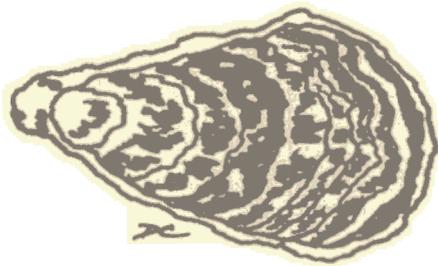
1 lb. can salmon  
1 chicken bouillon cube  
1 c. boiling water  
¾ c. chopped onion  
½ c. chopped green pepper  
1 clove garlic, finely chopped  
¼ c. butter or other fat, melted  
1/3 c. salmon liquid

1 lb. can tomatoes  
1 can (8 oz.) whole-kernel corn  
1 c. sliced okra (optinal)  
½ t. salt  
¼ t. thyme  
Dash pepper  
1 whole bay leaf



## TOLL-FREE POLLUTION REPORTING

A 24-hour toll-free number for reporting pollution is available through the U.S. Coast Guard's National Response Center (NRC) in Washington, D. C. The Center is staffed seven days a week and may be reached by dialing (800) 424-8802 from anywhere in the continental United States. The NRC has access to environmental safety information on chemicals and works with other governmental agencies in responding to pollution emergencies.



## OYSTER HATCHERY MANUAL

VIMS scientists have completed an oyster seed hatchery manual which is the culmination of seven years of research.

The Department of Marine Culture has developed an oyster hatchery system through research and cooperative efforts with the fisheries industry. Funding for the project was provided by the National Sea Grant Program and the Department of Commerce. This system, including the biological protocol, has been successfully tested and can be used for the American oyster (*Crassostrea virginica*) and the Pacific oyster (*Crassostrea gigas*).

Detailed instructions for the culture of larvae and algal food are contained in the manual. It also describes culture facilities, including floor plans and diagrams of the piping system. Throughout the manual are recommendations and solutions for problems faced by individuals wanting to start an oyster seed hatchery. Environmental considerations such as salinity, water quality, and pollution, as well as the permitting process are discussed. Also included in the hatchery manual are production costs and an income flow schedule for 20 months.

Questions on the physical facilities and biological concepts should be directed to Dr. John Dupuy at VIMS. The publication is available from the VIMS Sea Grant Communications Office and comes in hard bound (\$10.00), loose-leaf notebook (\$7.50), and soft bound (\$5.00) covers. Please make checks payable to the Virginia Institute of Marine Science.



## COASTAL CLASSROOMS

What are Virginians doing to preserve some of their coastal wetland areas for future educational and research purposes? This question is an important one in the face of intensified development in the tidal areas of all coastal states. Ken Dierks, graduate researcher at VIMS, is working to shed some light on the Virginia situation.

Dierks is reviewing public and private efforts at preserving certain estuarine (tidal) areas and adjacent lands including ecological reserves, research natural areas and parks. Each type represents the alternate uses to which a system of coastal natural areas might be put, and the general and specific objectives of each are important in the selection of potential sites.

At present, many scattered efforts are taking place in coastal Virginia to identify natural areas and ensure their preservation. Dierks' study will review efforts to inventory these areas, such as the Center for Natural Area's inventory of the Chesapeake Bay, and discuss the classification and selection of criteria used in these inventories.

Also, private activities ranging from individual acquisitions to state and national conservation groups will be cataloged and assessed for their purpose and the degree to which they are organized and coordinated.

Another phase of the study involves the activities of government (particularly on local and state levels) and regional planning bodies. These are being examined from the point of view of both current activities and the role different state agencies might take in the development of a system of coastal ecological reserves. The objectives of local comprehensive plans are being reviewed, as are the activities of agencies such as the Virginia Division of Parks.

On the Federal level, estuarine and marine sanctuaries programs and the activities of the Federal Committee Research Natural Areas may also apply in Virginia. Work has already begun on assessing the feasibility of designating an estuarine sanctuary in coastal Virginia.

Finally, other state programs for identifying, designating and preserving natural areas will be assessed as models upon which Virginia might develop a coastal reserve system. Some 22 other states have designated natural area systems; however, most of these are not specifically oriented toward aquatic environments.

Florida is an exception, and its coastal aquatic preserves program is examined in Dierks' study in light of Virginia's needs. Other states have useful legislative pronouncements and organizational arrangements which also merit review.

The results of Dierks' study should provide a clearer picture of what is being done to preserve adequate natural estuarine land and water areas. Equally important, the study can be a strong step to insure the preservation of ecological

diversity in Virginia for coming generations....for researchers, naturalists and the occasional visitor who just may be looking for a brief respite from the encroachment of development.

Anyone who personally knows about private efforts to preserve coastal land and water areas is encouraged to contact Ken Dierks at (804) 245-2811, ext. 60, in order to insure that the inventory of private activities is as complete as possible.



## VWA REORGANIZES

THE VIRGINIA WATERMAN'S ASSOCIATION, a 2-year-old organization in which most of the State's tidewater counties are represented, is making a concentrated effort to get off the ground as a strong force protecting and harvesting Chesapeake Bay's commercial marine resources.

In its first 1978 general meeting, held at Lancaster High School February 11, more than 400 members worked to elect new officers and define some of the problems and issues confronting them. John M. DeMaria, Jr. of Newport News emerged as the new president. Other officers elected were: vice president - Thomas C. Winstead, Kilmarnock; secretary - George Washington, White Stone; and treasurer - Douglas Jenkins, Hague.

According to DeMaria, VWA represents more than 500 members engaged in oystering, crabbing and commercial fishing, a group vitally concerned about Chesapeake Bay's future as a food producer. Because of this, they look askance at such things as oil spills and other types of pollution that can have a direct bearing upon their livelihoods.

VWA members are likewise highly interested and vocal when it comes to harvest regulations of oysters and other commercial shellfish. Many watermen feel that the Virginia laws governing the harvest of the state's marine resources are antiquated and need revision. Some feel more strongly than others on certain issues: Sometimes it depends on whether you're a patent tonger or a shaft tonger when it comes to views on who can harvest where.

As leader of VWA, 26-year-old DeMaria is outspoken in his criticism of some of the Virginia state agencies who he feels should back the VWA in its opposition to construction of an oil refinery on the lower James River.

Both VWA and the Oyster Packers and Planters Association are strongly against the Portsmouth oil refinery proposal, and point out that the Environmental Protection Agency, the National Marine Fisheries Services and the U.S. Fish and Wildlife Service are on record as opposing the refinery, too. Why? Because of the damage a large oil

spill could do to the James River oyster seedbed, the largest natural source of seed oysters in the world.

Another source of concern for the VWA is the use of chlorine as a disinfectant in sewage treatment. DeMaria points out that it is now common knowledge that chlorine is fatal to oysters in the larval stage. Speaking for the VWA, he strongly urges the Virginia Marine Resources Commission and the Water Quality Control Board to work faster on chlorine alternatives.

From the looks of it, the newly organized VWA has its work cut out. Its role has to be that of fighting to preserve an economic way of life whose existence depends upon a strong and unified watchdog attitude over the Bay's marine resources. Watermen are by nature a courageous lot, but they are independent also. Whether the new leadership can unify this group into a viable force remains to be seen.



## TAGGED STURGEON

An Atlantic sturgeon carrying two identification tags was taken in a staked gill net at mile 13 in the York River March 2 by William H. Green of Hayes, Va.

According to Dr. Joseph Loesch, VIMS Department of Ichthyology, the 4 lb. 8 oz. fish, 76 cm. in length, was tagged October 19, 1977 at Montrose Point (mile 39) in the Hudson River in New York state.

The tags were placed in the fish by the Littoral Society of Highlands, N. J. and William Dovel of the Boyce Thompson Institute, Yonkers, N. Y.

Both the Atlantic sturgeon and the shortnose sturgeon occur in limited numbers in Virginia's marine environment, and both species are fully protected under Virginia law. After the tags were removed from the fish, it was returned unharmed to the York River to continue its journey.



 Marine Resource  
**Bulletin**  
A Sea Grant Advisory Service

DICK COOK ..... EDITOR

Marine Resource Bulletins are produced by the Virginia Institute of Marine Science as a Sea Grant Advisory Services project. Subscriptions are available without charge on written request to the editor.

William J. Hargis, Jr. .... Director

## MARINE AFFAIRS

Relating hard science to realistic marine life management problems in what the Virginia Institute of Marine Science is all about. The input is research. The output is to educate, to inform and to advise. When the entire operating system is considered, when the diverse research, education and advisory expertises are brought to bear on a particular management problem, the resulting integration may be termed "marine affairs".

VIMS looks into all aspects of occurrences that affect Virginia's marine community, not the least of which concerns current legislation. It's one thing to conduct valuable research and quite another to derive maximum benefit from such activity in today's complex world, where various laws, grants and acts set the parameters of application.

Through a Sea Grant-funded course taught alternately at VIMS and the Marshall-Wythe school of Law at William and Mary, a mixture of science and law is being achieved to the benefit of all concerned. The course, *Environmental Law and Marine Affairs*, is conducted in seminar fashion, with speakers ranging from representatives of the commercial fishing industry to the heads of

federal agencies. Many staff members of VIMS have also contributed lecture time.

Besides the traditional teacher-to-student educational opportunity, the course affords interdisciplinary interaction between marine science students and law students, letting one side become aware of the other's challenges and problems.

Since most VIMS students end up working for either state or federal agencies, exposure to the state, federal and international institutional arrangements and to the major pieces of legislation in the marine field is valuable preparation. "In this way they'll know who the players are and have a better feel for the game once they get out there," explained course professor Bart Theberge.

In addition to teaching activities, Theberge is relied upon by VIMS and the Virginia General Assembly to advise in legislation concerning both research and practical matters concerning Virginia's marine community. He sees a real need to better develop, coordinate and expand educational activities in the marine affairs field, enabling researchers, educators and student to work in a unified manner to cope with contemporary problems.



# Marine Resource Bulletin

**A Sea Grant Advisory Service**

VIRGINIA INSTITUTE OF MARINE SCIENCE  
Gloucester Point, Virginia 23062

ADDRESS CORRECTION REQUESTED

