



Marine Resource Bulletin

A Sea Grant Advisory Service

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BOAT HOLDING TANK ISSUE DEFINED

To flush, or not to flush? Should boats permanently moored in designated Virginia oyster and clam-growing waters be required to install treatment toilets or holding tanks?

Public hearings held in Richmond June 1 and 10 attempted to answer this question. For the first time since hearings were initiated six years ago, representatives of all pertinent federal agencies, state agencies, waterman's associations, marine trade associations, and boat owner groups met to discuss their concerns.

The hearings and other meetings are being conducted by a legislative subcommittee which is working with the State Health Department. The primary issue being considered is whether the Food and Drug Administration's (FDA) National Shellfish Sanitation Program will require the health department to condemn additional oyster- and clam-growing areas for direct marketing around marinas if holding tanks are not required. Existing condemnation areas might also be reduced if the state went from the current no treatment to holding tanks or Coast Guard-certified flow-through treatment toilets.

Could a significant number of productive oyster and clam-growing acres be re-opened or secured from future condemnation if Virginia imposed a holding tank regulation? Unfortunately, no state or federal official at the hearings could answer this question. Several unknowns affect the situation, such as the relationship between discharge from a boat and the resulting bacteria count in the water overlying shellfish, or the turnover (flushing) rate of water in any given marina basin.

Dave Clem, Chief of the FDA National Shellfish Sanitation Program, stated in the June 10 hearing that, in general, a total retention system (holding tanks) was preferable to use of flow-through treatment devices and guaranteed greater protection for shellfish-growing waters. Clem also stated that use of flow-through treatment devices

MSD Compliance Schedule	
	75 76 77 78 79 80 81
New Vessel Schedule	Newly installed MSDs must be type II or III except
	MSD, if installed, must be type I, II or III
Existing Vessel Schedule	MSD, if installed, must be type II or III except
	if type I MSD is installed before 1/31/78 then, the type I MSD may be used indefinitely
	if a type I MSD is installed after 1/30/78, it must be replaced with a type II or III by 1/31/80

type I : treatment device

type II : treatment device with more stringent requirements

type III : no discharge device

would be an improvement over no treatment of sewage from boats. He said that a holding tank regulation possibly could result in a worse situation than requiring treatment devices, if use of "cheater pumps" became common practice. Clem testified FDA will always strongly recommend that states enforce condemnation zones around marinas because of the potential gasoline and oil spills as well as sewage. When asked if condemned areas around such facilities could be opened if all boats in marinas had holding tanks, he responded that possibly some areas could be recovered for direct marketing of shellfish. Clem urged that the boating community make every effort to meet deadlines of the federal marine sanitation device regulations

The Water Resources Research Center of Virginia Polytechnic Institute and State University has been requested by the legislative subcommittee to analyze the many issues surrounding the holding tank question. The center will likely submit its report in time for the results to be included in the

subcommittee's report to the Senate October 1. At a closed hearing on May 10, Dr. James Kenley, State Health Department Commissioner, stated that his department would delay enforcing the pumpout facility requirements at marinas until the legislative study is completed.

Where does this leave the coastal Virginia boat owner who wants to install a device aboard his craft and not violate the law? According to the June 10 hearing testimony from U.S. Coast Guard Headquarters, any boat built after January 30, 1975 (a "new" vessel) is exempt from state regulations as of January 1977 and must comply with federal regulations for marine sanitation devices

(MSD). Any boat built prior to the January 1975 deadline (an "existing" vessel), if it is outfitted with a Coast Guard-certified device, will become exempt from state requirements at the time of installation unless the state has an EPA no discharge regulation. A list of Coast Guard-certified small vessel marine sanitation devices is available from the Office of Merchant Marine Safety, U.S. Coast Guard Headquarters (G-MMT-3/83), Washington, D.C. 20590 (202-426-1444), or from Jon Lucy, Department of Advisory Services, VIMS, Gloucester Point, VA 23062 (804-642-2111). Lucy can also provide additional information on the holding tank issue.

MENHADEN SEASON BEGINS IN MAY

The 1977 menhaden fishing season in Virginia extends from the third Monday in May through the Friday before Thanksgiving. The Atlantic menhaden ranges from Maine to Florida and is one of the most abundant fishes found along the Atlantic coast.

Menhaden are not usually eaten directly by man but are processed into meal, oil, and condensed soluble proteins. The meal and condensed solubles are rich in protein and make an excellent food supplement for poultry, swine, and cattle. The oil is used in various industrial products including paints, soaps, and lubricants, and is exported to Europe to be made into margarine.

VIMS scientists serve on the Atlantic Menhaden Scientific and Statistical Committee, which is sponsored by state and federal governments and industry. The committee is working to ensure proper management of the fishery.

Menhaden fishing is allowed only in certain portions of the Chesapeake Bay and its tributaries. Detailed boundary descriptions may be obtained from Section 28.1-59 of the Laws of Virginia, Relating to Fisheries of Tidal Waters, or by contacting your local office of the Virginia Marine Resources Commission.

VIMS RESEARCHERS CONTRIBUTE TO BOOK

During June 1972 tropical storm Agnes released record amounts of rainfall on the watersheds of most major tributaries of the Chesapeake Bay. The resulting floods, categorized as a once-in-200-years occurrence, caused environmental fluctuations in the Bay on an unprecedented scale.

Under the direction of the Chesapeake Research Consortium, scientists examined the effects of this exceptional natural event on the hydrology, geology, water quality, and biology of the region. Other specialists studied the impact of the storm on the economy of the Tidewater Region and on public health. Their reports identify and estimate the direct income losses to fishing and recreation industries resulting from ecological damage and adverse weather. Raw sewage, hazardous chemicals, silt, and debris carried into the Bay by the floods presented many threats to public health. The description of prompt measures taken by government and other groups will, it is hoped, provide useful models for coping with future natural disasters.

About 30 VIMS researchers contributed to the 752-page publication. To order, send \$22.50 to The Johns Hopkins University Press, Baltimore, MD 21218.

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ANN GREER EDITOR

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William J. Hargis, Jr.

Director



A thesaurus of index terms used in the National Aquaculture Information System (NAIS) has been published recently by VIMS. The thesaurus has been developed to facilitate use of the NAIS, which is a part of the federally funded Oceanic and Atmospheric Scientific Information System (OASIS). The thesaurus, which costs \$3.00, and further information are available from VIMS Marine Education Center, Gloucester Point, VA 23062.



THE FISH HOUSE KITCHEN

The concept of fondue originated in eighteenth century Switzerland when humble mountain dwellers sought to ease the monotony of eating stale bread. We'd like to offer a variation on the classic cheese pot -- the fish fondue.

Fish and shellfish are well suited to this cooking method because they cook quickly; guests or family won't become impatient preparing one morsel at a time. But be sure and buy fresh fish if possible. Fish that have been frozen and thawed are extremely delicate and tend to fall off the fondue fork while cooking.

CHEESE-CRAB FONDUE

<i>8 ounces fresh blue crab meat, lump or special</i>	<i>¼ cup milk or half & half cream</i>	<i>2 teaspoons lemon juice</i>
<i>1 can (10 ounces) frozen condensed cream of shrimp soup</i>	<i>½ cup shredded process American or Cheddar cheese</i>	<i>dash paprika</i>
		<i>dash white pepper</i>
		<i>2 teaspoons sherry, optional</i>

Drain crab meat and remove any remaining shell or cartilage. Thaw shrimp soup and combine with milk in fondue pot. Cover, heat over direct moderate flame, stirring often. Fold in remaining ingredients except sherry. Adjust heat to low flame. If desired, stir in sherry just before serving.

Use as an appetizer with Mebla toast or as a luncheon dish on toast points or in patty shells. Add more milk if a thinner mixture is desired. Makes approximately 2¾ cups, or at least six servings.

VIMS TO ADVISE PROCESSORS ON WATER POLLUTION REGULATIONS

The Federal Water Pollution Control Act promises to affect Virginia's seafood industry in several ways. By significantly decreasing the discharge of harmful pollutants into the nation's waters, the Act will benefit the industry as production of marketable fish and shellfish increases. At the same time, however, regulations controlling the discharge of waste waters into navigable waterways impose stricter requirements on the state's seafood processors.

To help these businesses understand and comply with the regulations, this year VIMS established the "Advisory Assistance for Seafood Processors" service. Support for the project is being provided by the Coastal Plains Center for Marine Development Services. The main purpose of the new VIMS program is to provide technical assistance to processors who discharge their waste water into navigable streams, and to advise on procedures for obtaining the necessary discharge permits from Virginia's State Water Control Board.

In addition, advisory personnel are consulting with representatives of neighboring states to investigate the technology for treatment of seafood processing wastes, and are updating discharge treat-

ment standards along with the techniques designed to meet those standards. The VIMS advisors will maintain contact with federal and state water pollution agencies, particularly the Water Control Board.

The advisory effort will provide a number of different services to the state's seafood processing businesses. These services include:

- Plant visits upon request
- Explanation and interpretation of permit requirements and effluent limitations
- Advice on proper sampling techniques and flow calculations
- Recommendations on improvement of waste control processes to decrease pollutant load
- General advisory assistance on other aspects of seafood processing which might affect waste water discharge

The seafood processor advisory program is being coordinated by VIMS Division of Environmental Sciences and Engineering. Further information on the program is available from Joseph Mizell or Walter Priest at VIMS Wetlands Section.



Q: I would like some information on zooplankton and phytoplankton of the sea.

Emilie Hancock, Midlothian, VA

A: The Greek word *plankton* means wandering, and it is this way of moving that distinguishes both the animals known as zooplankton, and the plants we call phytoplankton. Although some of these organisms can swim, most are so small that their only effective self-directed movements are up and down. Their horizontal distribution is determined by water currents.

Phytoplankton is in many ways the basis for life in the sea since among its members are the tiny plants which turn solar energy into food through photosynthesis. This food is eaten by the zooplankton, which may be eaten by larger animals in a food chain which often ends with man. Some fishes, like menhaden and anchovies, and some whales, like the blue whale, make this chain short and simple by feeding directly on plankton.

The smallest type of phytoplankton is called nanoplankton. They are poorly studied simply because they are delicate and hard to see. Their size belies their importance since by their astronomical numbers they actually outproduce the larger forms of phytoplankton such as diatoms and dinoflagellates.

Diatoms are microscopic in size. They, like the dinoflagellates, can be collected using a net with a mesh size similar to that of a nylon stocking, while the nanoplankton would pass through such "large" holes. The diatoms, which live in beautiful and delicate two-part glasslike shells, have been called the "grass of the sea" because of their importance as food for "grazers" of the sea like zooplankton, oysters, and menhaden.

The dinoflagellates, while also important as food for the grazers, are perhaps most famous for the toxic properties of some species. The so-called red tides, which have killed fishes in Florida and contaminated clams in Massachusetts, consist of millions of poisonous dinoflagellates in concentrations so dense that they color the water.

Zooplankton, while mostly small by human standards, are large enough to use the phytoplankton as food. Some larger animals, like the stinging nettle, can be thought of as plankton since they essentially drift with the cur-

rent. We might even call the ocean sunfish, which grows to over a ton, planktonic since it is such a poor swimmer.

Zooplankton is commonly divided into groups based on whether or not the animal is planktonic for its whole life or only a part. The ocean sunfish is one of very few fishes which are planktonic as adults, although many fishes have planktonic larvae. Wholly planktonic animals are called holoplankton, while animals planktonic for only part of their life are called meroplankton.

MARINE EDUCATION ACTIVITIES FOR SUMMER

This summer's schedule for the VIMS Marine Education Program includes programs lasting from one hour to eight weeks, for students from kindergarten to graduate school, at two VIMS laboratories and in the field. These programs, like others throughout the year, have been developed to increase awareness of and appreciation for our marine environment and its resources. While some of the programs have been going on for several years, there are several which are new.

One new program of particular interest is the Youth Conservation Corps (YCC), which will involve approximately 20 young people between the ages of 15 and 18 in an eight-week work/study program. Each participant will be paid to work 30 hours per week on conservation and marine science projects. In addition, 10 hours a week are set aside for classroom and field instruction. Activities will include cruises aboard VIMS research vessels, trips to beach and marsh, and student seminars.

The York County Public Schools program for the gifted and talented will cooperate with VIMS in providing a week-long program for 40 students at the institute and York High School. The Virginia Wildlife Federation (VWF) is sponsoring a similar five-day study program to be held at the Eastern Shore lab in Wachapreague. The VWF program will involve 28 students between the ages of 15 and 17. Those selected for the program will study marine life, beaches, and the general ecology of salt marshes. The VWF is providing room and board for all the participants during their week at Wachapreague.

Educational programs at VIMS are scheduled almost daily for school groups, clubs, or other organizations. Education specialists will also travel within Virginia and to other states to participate in professional workshops, to instruct summer courses, and to provide expertise in the marine sciences for students, fellow educators, and the general public.

A CLOSER LOOK

at the DEPARTMENT OF ECOLOGY-POLLUTION

Marine pollution -- now that we have it, how do we deal with it? A good place to start is an assessment of the effects pollutants have on organisms and their environments. Then enlightened decisions can be made on how to manage our marine resources and plan for the future.

VIMS Department of Ecology-Pollution is working to understand the often complex effects of a variety of contaminants on the marine environment. Scientists are studying chemical toxicants and their pattern of movement after entering Virginia's waterways. They are investigating the effects of trace metals, pesticides, and petroleum hydrocarbons which enter the water from sewage treatment plants, industries, and the like.

Alterations of the environment itself affect marine plants and animals. Changes in water temperature around power plants or changes in topography from dredging and filling may influence the feeding or reproduction of marine plants and animals.

Wetlands inventory, research, and advisory activities are among the duties of the department's scientists and staff. This area between land and water produces plant material which washes into deeper water and becomes a significant part of the marine food chain. In addition, it serves as a spawning area for fish. Activities include mapping and indicating the composition of all wetlands areas in the state; research on the cycling of nutrients in the marshes; and an extensive program advising planners, managers, and landowners on the environmental effects of marsh development.

The Department of Ecology-Pollution is composed of about 45 scientists, technicians, and graduate students. Scientific personnel represent several

disciplines -- botany, physics, and both organic and inorganic chemistry. This diversity is required because pollution problems and the instruments used to analyze the data are usually quite complex.

An important function of the department is to assist state regulatory agencies such as the Water Control Board and the Health Department by providing scientific data and recommendations. For example, if an oil spill occurs, VIMS staff will visit the site to estimate impact on the environment and the extent of the cleaning operation.

Current activities in the department include:

- Research to determine how oil pollution affects marsh plants and animals.
- Research on the migration of trace metals such as copper and cadmium in estuaries.
- Research to determine if increased water temperature caused by industrial activity harms or aids plankton.
- Research on the location of Kepone in river sediment and how long it will be there. Scientists are working to determine if the chemical will dissipate, and if it will not, how authorities can dispose of it.
- Baseline data have been gathered on levels of hydrocarbons and metals on the Outer Continental Shelf. This study for the Bureau of Land Management will help determine the feasibility of offshore oil development.

SUPREME COURT DECISION AFFECTS VIRGINIA FISHING

In May the U.S. Supreme Court ruled invalid two Virginia statutes in *Douglas v. Seacoast*. One law stipulated that Virginia fishing licenses could be issued only to U.S. citizens; the second law permitted only Virginia residents to fish for menhaden in the Chesapeake Bay.

The Virginia Marine Resources Commission (VMRC) is the enforcement agency for laws pertaining to the marine environment. The commission, with the advice of the attorney gen-

eral, will review the invalidated statutes along with other laws that may be vulnerable. VMRC will then recommend appropriate changes to the 1978 General Assembly.

At present, however, only those laws considered by the Supreme Court are invalid. The new ruling holds that foreign owned or nonresident vessels enrolled under federal licensing laws cannot be excluded by Virginia statutes from fishing in state waters.

On June 10, 1970, the Federal Communications Commission adopted new regulations which state that no new ship double sideband (DSB) licenses would be issued after January 1, 1972, and that only single sideband (SSB) licenses will be permitted in the 2 MHz band after January 1, 1977. DSB licenses in effect on January 1, 1972, expired on January 1, 1977. SSB will be available for those boaters who continue to have a long range communications requirement. However, the new regulation states that you must have VHF-FM before you can have SSB.

For more information on marine radios contact:

Federal Communications Commission
Washington, D. C. 20054
Tel: 202/ 632-7125

The Fisherman's Business Guide was written by Frederick J. Smith, a fisheries economist. This book is designed for fishermen or potential fishermen in all types of fisheries. It presents basic economic principals and management tools that any fisherman can use in making decisions. The text is divided into three parts: economic concepts, management tools, and applications. Mr. Smith provides a framework the fisherman can use to evaluate current or proposed operations, consideration of expansion, or concentration in one or more fisheries. The author uses terms and examples that fishermen can relate to providing definitions of new terms and concepts, and following through with clear and complete examples on application. (International Marine Publishing Co., Camden, Maine, 1975, 172 pp., \$10.95)

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