



Marine Resource Bulletin

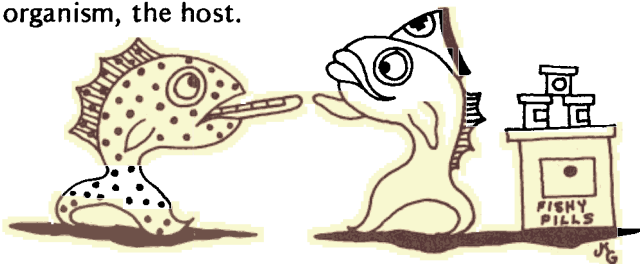
A Sea Grant Advisory Service

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VIMS, November/December 1977

SOLUTIONS FOR SICK FISH

The VIMS Parasitology Section, with the aid of other Institute research groups, provides information and advice on fish diseases to state agencies, to other VIMS researchers, to industry, and to individuals. Personnel in the Parasitology Section study fish parasites and the effects the parasites have on their hosts. Parasites are organisms such as worms and lice that live in or on and at the expense of another usually larger organism, the host.



Diagnosing a disease or the cause of other problems in fishes is often a coordinated effort. The histology laboratory prepares fish tissues for microscopic examination and the histopathologist assists in the analysis of the prepared tissues. Specialists in the Bacteriology Section identify bacteria that have been isolated. Personnel in the Ichthyology Department collect fish specimens and provide background information on the biology or recent natural history of the affected fishes. Often the Ichthyology Department and the Department of Advisory Services serve as the initial contact point for inquiries from industry or commercial fishermen. The Department of Ecology Pollution might also get involved if a waterborne toxic substance such as heavy metals or chlorine is the suspected cause of the problem.

Techniques for diagnosing fish diseases have not reached the degree of sophistication that they have in human medicine. In addition, fish are often obtained for study after death. When a fish dies, rapid tissue alteration makes diagnosis difficult and often ambiguous. If live but sick

fish are available for examination, the diagnostic procedures might kill the fish because they are so small.

Another problem facing the investigator is that the death or condition in the fish is merely the end point in a long chain of unknown events. Are the microorganisms that are found in the fish at the time of death really the cause of death, or did they become associated with the host after it became sick? When did the process toward death begin -- with stress such as rapidly changing water temperatures, or pollution, or too little oxygen, or was it an early encounter with a germ that left it weak and susceptible? Is the fish just old? Often a diagnosis can be made, but many times the cause remains undetected.

Stress is an important component of the process leading to disease. Whether or not stress leads to disease depends on the kind and amount of stress and the health or resistance of the fish. Parasitologists and ichthyologists at VIMS are beginning to look into the problems of defining stress and health and measuring them in fishes. Blood and tissue samples are being used in these studies.

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FISH KILLS - All fish kills and any type of water pollution must be reported immediately to the Virginia State Water Control Board (SWCB), not VIMS. The SWCB 24-hour Pollution Response number is: (804) 786-2441. The SWCB will contact VIMS if assistance is required.

FISH DISEASE AND OTHER PROBLEMS - Inquiries from the public concerning fish diseases should be directed to VIMS Department of Advisory Services, (804) 642-2111, ext. 126.



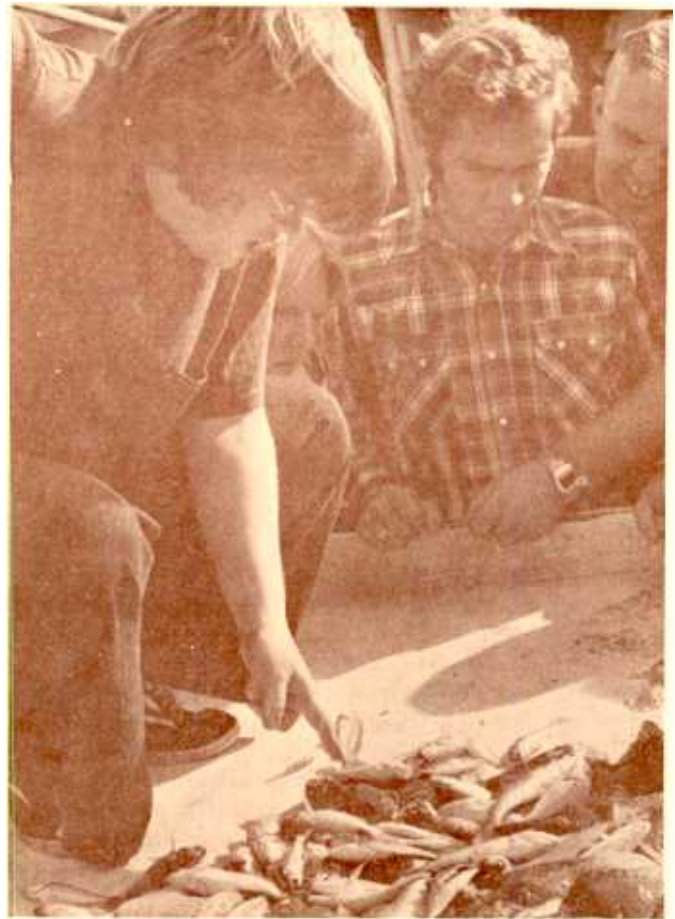
A workshop on "What's Happening in Marine Education in Virginia" was held at VIMS on November 4th and 5th. Over 135 educators crowded into conference rooms at Gloucester Point and the Yorktown Victory Center to hear programs on everything from national policy on marine education to suggestions for individual class work. Sponsored by the National Sea Grant Program through a grant to the University of Delaware, the meeting was the first in Virginia to draw together such a comprehensive group of teachers, supervisors, and consultants interested in the marine environment.

VIMS Director Dr. William J. Hargis, Jr., welcomed the group. He emphasized the long history of marine education at the Institute and the continued support he feels is essential in the future. He was followed by Hal Goodwin, well-known educational and scientific consultant and author who has been an associate director of the National Sea Grant Program. Mr. Goodwin presided over a discussion of his policy statement, "An Introduction to Marine Education".

During the morning sessions, participants chose from programs on the national Education Resources Information Center (ERIC), "hands-on" classroom activities, a multidisciplinary course from McLean High School, a panel discussion of marine museums and aquaria, or a tour of the Sea Lab mobile unit from the Virginia Mathematics and Science Center.

The afternoon sessions was convened at the Yorktown Victory Center. A standing room only crowd heard 16 speakers give a brief outline of what they were doing in marine education. As Hal Goodwin remarked later: "Even some of the Virginians were surprised at how much was going on".

Dr. Joseph Exline of the Commonwealth's Department of Education stressed the importance of cooperation among marine educators and offered the continuing services of his state-wide



A member of VIMS educational staff points out choice trawl specimens to a supervisor of science teachers.


science communications system. He also pointed out that the content of marine education needs to be more carefully and fully identified, and that teacher training and research methods must be emphasized.

Speakers representing every level of education in Virginia, from elementary to continuing, described their efforts. Presentations on curriculum development courses for the gifted and talented, field explorations, work-study programs, marine technician training, and seafood products education showed initiative and innovation. A Deep Sea Ventures executive added an industry view of the importance of marine education to the wise use of our ocean resources.

Dr. Wes Batten of the Virginia Mathematics and Science Center chaired a session on organizing a marine education association for Virginia, and there was consensus that such a group should be formed. A committee of volunteers will meet in the near future to discuss the details of such an association. Their recommendations will be sent to all the subscribers to the *Bulletin* who are in the education section of the mailing list.

The second day of the conference was set aside for field trips, use of the VIMS - Sea Grant Marine Education Center, and longer visits to the Sea Lab mobile unit. John Page Williams of the

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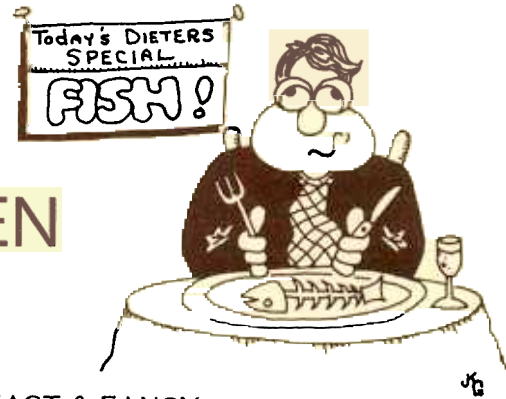
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ANN GREER EDITOR

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William J. Hargis, Jr. Director

THE FISH HOUSE KITCHEN



SEAFOOD NUTRITION -- FACT & FANCY

How many times have you heard that fish is "brain food"? Or that eating oysters makes you more amorous?

The idea that eating fish enhances your brain dates back to the 19th century and a Harvard University scientist. He discovered that compounds containing phosphorus are abundant in the brain. So he urged people to eat fish, which is rich in phosphorus. The scientist reasoned that increased amounts of phosphorus in the brain would increase brain power -- a concept that has since been disproved.

Oysters contain cholesterol, the basic building block for both male and female sex hormones. But the body produces enough cholesterol to satisfy our total needs. The additional cholesterol will not affect sexual behavior.

Seafood won't improve your IQ or act as a love potion. But it is high in protein and low in fat -- a combination that makes seafood attractive to dieters. Many people have also learned that seafood is low in sodium and high in potassium. This combination is especially attractive to people with heart problems. Sodium causes the body to retain water and aggravates high blood pressure; potassium tends to negate the effects of sodium.

Part of developing a nutritional label for seafood involves determining if the nutrients present in fish are also available to the human body. The minerals in a food product may pass through the body instead of being used. For example, fish, which is considered a low moderate source of iron, is not a source of iron in the human body. But fish may help make the iron in other products available to humans. Seafoods may enhance the uptake of iron in foods such as spinach, wheat, and soybeans which have iron normally not available to the human body. Similarly, the protein in fish helps enhance the availability of other minerals to the body.

The nutrients in seafood work in concert with the body and the other foods we consume. Fish has an important place in the four food groups and provides a good substitute for red meat in the meat group.

If you eat seafood twice a week, you can cut down on calories and add variety to your eating habits. Variety is the essence of good nutrition, and seafood, in particular, provides a sound complement of protein, minerals, and fats to give you the balance you need.

SHRIMP AND MUSHROOM SOUP

1 stick butter
1 pound fresh mushrooms
3 cups chicken broth
1 pound raw shrimp
½ pint heavy cream

white pepper, to taste
salt, to taste
1 teaspoon dry dill
flour

Lightly saute sliced mushrooms in melted butter. Add chicken broth and heat. Add salt, white pepper, and dill. Add flour to thicken as desired and cook 5-10 minutes. Add shelled, deveined shrimp and heat until shrimp are cooked. Add cream and serve hot. Serves 4-6.

REMOTE SENSING PROVIDES LONG DISTANCE INFORMATION

Zoom transfer scope, Kelsh plotter, electronic digitizer planimeter, and Hasselblad 500--where are you likely to find all of these instruments at work? In a hospital laboratory, in a photography studio, or on a fishing vessel? A better guess is at the VIMS Remote Sensing Section.

Through the use of remote sensing, information about the earth can be acquired from a distance. The information is obtained by using one or a combination of such things as the eye or camera, radar, infrared scanners, and aircraft or satellites. The data is then applied to a variety of estuarine and coastal problems. Remote sensing techniques play a significant, and often critical, role in deciding what action state or local agency, industry, or government officials will take.

One of the major applications of remote sensing can be found in the "Elizabeth River Surface Circulation Atlas". The Atlas summarizes individual remote sensing studies of circulation pat-

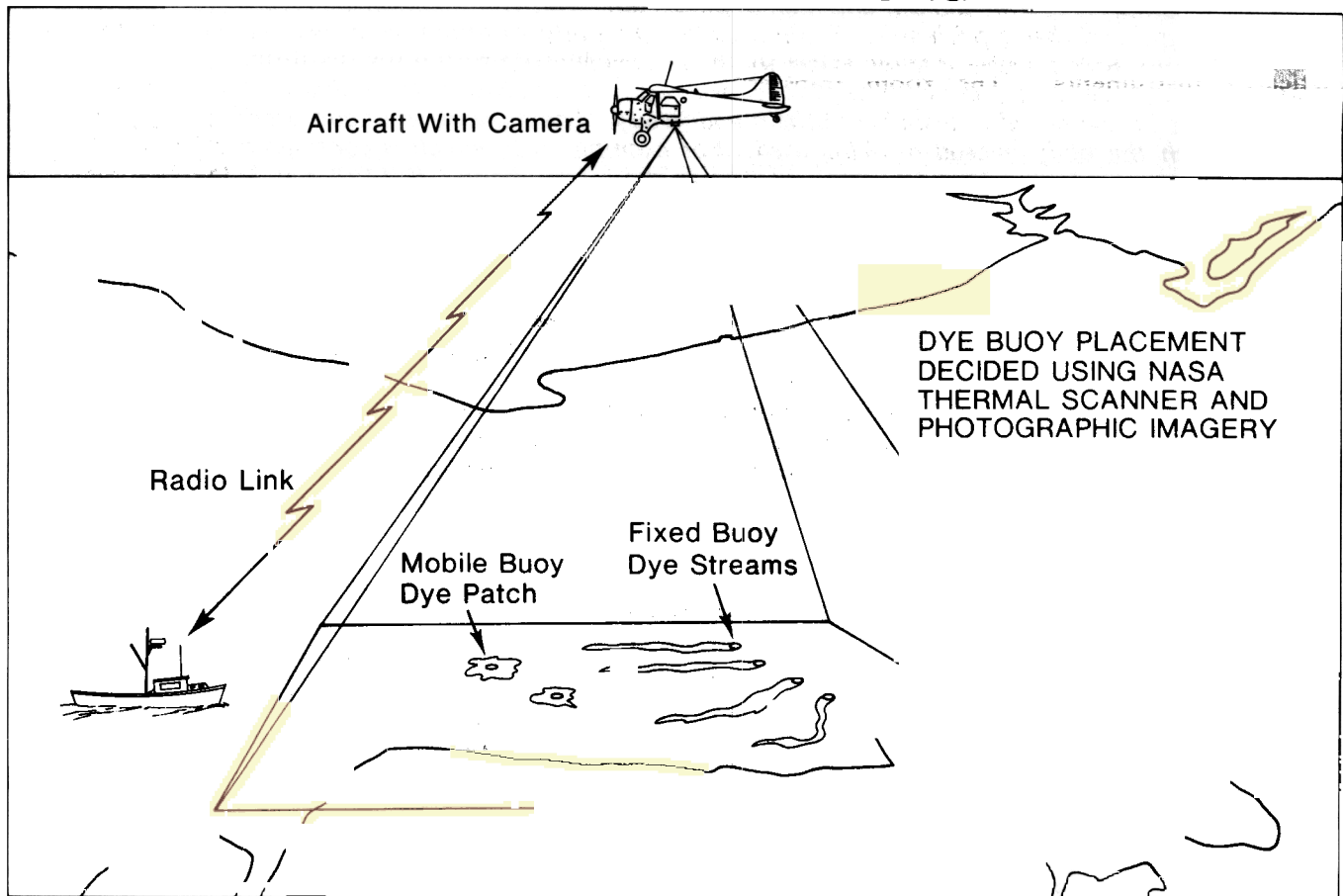
terns for different wind and tide combinations in the Hampton Roads area. Scientists believe the Atlas will improve the use of circulation data. It will also provide a standard method of communicating the data.

Although not yet in the final publication stage, the Atlas will serve as a useful reference for Coast Guard marine safety offices, local government agencies, and commercial fishermen. Engineering/consulting firms will refer to the Atlas while conducting sewage outfall studies or preparing environmental impact statements. The Atlas of circulation patterns will also be useful in deciding on oil and pipeline routes, in determining the best placement of tanker loading facilities or electric power generating stations, and in planning harbor construction or modification projects.

In 1974 the City of Hampton asked VIMS to supply it with information concerning beach

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DYE BUOY REMOTE SENSING



Aerial photographs of paths followed by both mobile and fixed buoys provide data needed to determine circulation patterns in the Hampton Roads area. Radio contact can be maintained with a vessel in the area to assist in the recording process.

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stability and preservation in the Buckroe Beach area. Remote sensing staff provided the necessary photographs with interpretations to the Hampton officials. The data will be used by city managers in making decisions concerning a beach recreational area.

Because a trend has developed in Virginia to use satellite data, the remote sensing staff anticipates the use of NASA LANDSAT (satellite) data at VIMS. Information gathered by LANDSAT is recorded on a magnetic tape. After processing the tape recording, the data are transformed into photographic images or maps of vegetation, water quality, coastal erosion, and land-use changes. These data are used by coastal zone management personnel in making decisions about land use, water quality controls, and other coastal problems.

The remote sensing staff now has the capability to produce color photomosaics and various maps showing land-use change, vegetation, coastal erosion, water pollution, topographic contours, and water circulation. Maps concerned with environmental impact evaluations can also be produced.

Remote sensing personnel have also been involved in projects related to sewage outfall siting, mapping of oil pollution danger zones, public beach enhancement, wetlands protection, and protection of shellfish beds from dredging.

The remote sensing staff uses several types of sophisticated instruments. The zoom transfer

scope allows you to view a map and a photograph simultaneously. The map can be magnified and/or expanded so that it assumes the exact proportions of the photograph. Aspects of the photograph such as vegetation, topography or coastline features can then be manually transferred to the map.

The electronic digitizer planimeter makes automatic measurements of flat areas on a map. For example, acreage of a certain wetlands area can be automatically measured by tracing the area with an arm extended from the automatic recording device. The data are recorded on a magnetic tape from which a computer printout containing the specifically desired information can be obtained.

Aerial photography to altitudes of 10,000 feet is accomplished by the staff from the VIMS DeHavilland Beaver aircraft using the Hasselblad 500 and Nikon F2 cameras with color, color infrared, black and white, and black and white infrared film.

The remote sensing section is equipped to conduct research and evaluation of specific coastal problems with a staff trained in physical oceanography, environmental geography, biophysics, physics, geology, and general marine science. The program began seven years ago with several NASA grants. It is now supported by a continuing NASA grant and through various users of remote sensing capabilities within the Institute.

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Similar studies of freshwater fishes has been underway for some time at other laboratories, but parallel work on marine fishes is lacking.

The knowledge and expertise gained in the diagnosis of fish disease are not easily applied to natural systems. For example, knowing that a fish kill was caused by bacteria does not mean a cure can be effected, since it is impossible to treat even portions of rivers with antibiotics. Enlightened management of a fishery or the reduction of man-induced stress such as pollution can certainly help, however.

Diseases in aquaculture operations are amenable to control. The crowded conditions in aquaculture which make it so productive also promote the rapid development of problems that can wipe out large numbers of fishes quickly. Because of crowded conditions, stress increases and disease agents and parasites transfer from one fish to another more easily and reach greater numbers more quickly than in nature. In-depth knowledge of parasites, their effects, and interaction with stress to produce disease is mandatory for aquaculture to be successful.

Providing information and advice on fish diseases and other afflictions serves not only the requestor but also assists VIMS investigators toward a better understanding of the parasites and disease agents in local fish populations. This knowledge, together with ongoing research, will shed light on many of today's problems and prepare for aquaculture activities in the future.

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Chesapeake Bay Foundation took his group in canoes through the Poquoson marshes, while others visited with Barbara Thomas at the Shackelford-Schlifer Seafood House in Severn. A third group went for a cruise on the York River with educational staff aboard the VIMS research vessel *Langley*.



FISHERIES SYMPOSIUM

TAX GUIDES AVAILABLE

The third annual Marine Recreational Fisheries Symposium will be held at the Omni International Hotel, Norfolk, VA, on March 29 and 30.

The meetings will deal with social, economic, and scientific aspects of marine recreational fisheries, with special emphasis on the mid-Atlantic region. Symposium sponsors are the International Game Fish Association, the National Coalition for Marine Conservation, the National Marine Fisheries Service, the National Oceanic and Atmospheric Administration, and the Sport Fishing Institute.

Major segments of the recreational fisheries to be analyzed by panels are: Shore Fisheries - pier, jetty, bridge, beach; Inshore Fisheries - small boats in bay, sound and nearshore waters; Offshore Fisheries - continental shelf troll and bottom fishing; User Groups - views of research programs and needs relative to management. Speakers are from academic institutions, state and federal government, regional management councils, recreational fishery user groups, citizen activist groups, and commercial fishery groups.

Advance registration fee (prior to February 15) is \$30. Further information and registration forms may be received by contacting Dr. Frank Carlton, National Coalition for Marine Conservation, P.O. Box 5131, Savannah, GA 31403, or Jon Lucy, VIMS Department of Advisory Services.

VIMS has a supply of the 1978 edition of the *Tax Guide for Commercial Fishermen*. The tax guide is for use in preparing 1977 returns, and will assist commercial fishermen in becoming familiar with federal tax laws as they apply to the fishing business. For example, it explains when and how certain kinds of income expenditures may be deducted.

The publication has been designed primarily for the commercial fisherman who operates a business as a sole proprietorship and reports the profit or loss on Schedule C (Form 1040). However, much of the material in this publication will apply to all commercial fishermen regardless of how their business is organized, or the dollar volume of business conducted. It does not cover the corporate or partnership form of business operation.

The publication is divided into 13 chapters, each of which provides tax information relating to a different aspect of a fishing business. Chapters include Filing Requirements and Return Forms, Recordkeeping and Preparation of Returns, Business Expenses, and Acquisition and Depreciation of Business Assets.

Free copies of the tax guide may be ordered from the VIMS Sea Grant Communications Office.

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