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CURRENT MSX ACTIVITY IN CHESAPEAKE BAY

Research aimed at rearing disease-resistant oysters for rehabilitating abandoned oyster grounds in lower Chesapeake Bay has shown that oysters can be grown successfully in areas infested with the microscopic parasite MSX, according to Dr. Jay D. Andrews, head of the VIMS Department of Malacology. The problem is to obtain commercial quantities of resistant seed oysters.

Both native and selected laboratory-bred offspring have been reared from spatfall to market size without sustaining intolerable losses, Dr. Andrews said. Predation, winter smothering and storm damage continue to be important causes of mortality.

According to the scientist, offspring of oysters native to the lower Chesapeake Bay have exhibited resistance to prevailing levels of MSX activity in seven consecutive yearclasses from 1964 through 1970. Oysters of these yearclasses have exhibited mortalities of less than 20 per cent per year, not including losses from smothering and predation.

Use of areas where MSX is active requires resistant seed oysters. These may be obtained in two ways, Dr. Andrews explained. Brood oysters heavily selected by MSX for several years may be bred in hatcheries and thus produce genetically resistant seed. The hatchery method has not yet been proven economically feasible and the quantity of seed needed is too large for existing hatcheries. The other method is to obtain seed with acquired resistance gained by exposure to MSX from egg and larval stages to seed size. The parents of these natural sets in seed areas are upriver; they are not exposed or selected and do not exhibit resistance.

Areas where MSX is active usually have predators that prevent tiny seed oysters from surviving. Certain marginal areas such as the Piankatank River have produced resistant seed but growth and spatfalls have been inadequate. These seed areas must be monitored with susceptible imported oysters to determine the level of MSX activity and insure that seed oysters have acquired the necessary resistance. Native set oysters usually exhibit little mortality and very few infections of MSX.

Virginia's oyster planting and growing grounds have been classified by VIMS scientists into four types of areas according to intensity of MSX activity. These types, described below, are illustrated on page 2.

TYPE I areas have a high-level of MSX activity, with prevalences of

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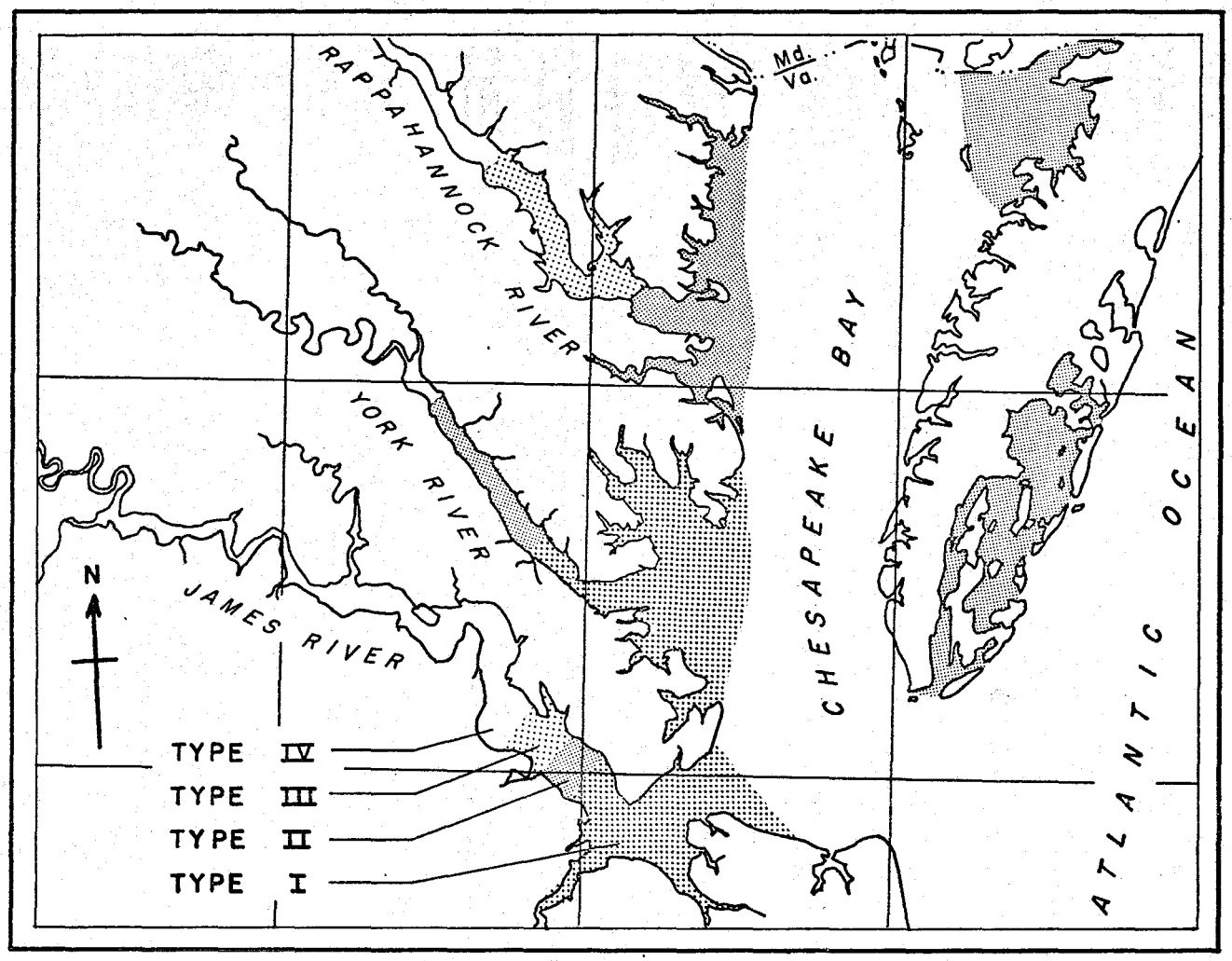

Classification of Virginia oyster grounds by intensity of MSX activity. Four types of areas are designated ranging from high-level MSX activity to none.

of 30 per cent or higher in live oysters, and with late-summer and fall mortalities of 20 to 50 per cent by December of the first year. (Heavily shaded areas on map).

In TYPE II areas, MSX exhibits the same timing but at lower levels of prevalence and mortality (less than 20 per cent for both usually). Activity fluctuates considerably from year to year. (Moderately shaded).

In TYPE III areas, infections appear late (October and November) and little or no mortality occurs. Typically, oysters in these areas have light infections which are carried through the winter but are discharged by oysters in spring without deaths. In dry years, these areas may become TYPE II, or even TYPE I areas. (Lightly shaded).

TYPE IV areas are free of MSX. These are always low-salinity areas usually free of predators and other diseases. (No shading).

Average conditions for many years are shown on the map since boundaries

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(Continued from page 2)

of the areas vary in location due to change of salinity and other factors, and it is necessary to monitor each yearclass of seed oysters for MSX.

Excluding Seaside of Eastern Shore, only three rivers now provide public seed in Virginia, Dr. Andrews said. The James River is the major source despite a drastic decline in production, and its seed has been infected at significant levels three of the eleven years since MSX appeared. Dr. Andrews said this has been no problem, provided oysters are planted in areas with equally low salinities.

The Piankatank River has exhibited low-level MSX infections in native seed rather persistently and the level of exposure demonstrated by susceptibles has been moderate, said the scientist. This river (and Mobjack Bay and tributaries, if seed can be obtained on shell plants) is the only natural source of resistant seed for lower bay planting. Several trial plantings have demonstrated that this seed does survive in MSX areas.

"An import of 1968 yearclass Piankatank seed at VIMS had 19 per cent death rate and no cases of MSX in 50 live oysters sampled in 1969," said Dr. Andrews. "Unfortunately, shell plantings in the Piankatank River have not attained sets adequate for tongers to sort in the past two years, and the State has had to move unculled seed to public oyster rocks."

The Great Wicomico River is essentially free of MSX and the seed is considered to be susceptible. New trays have been established in the Piankatank, lower and middle Rappahannock and James rivers with susceptible oysters for 1970. These are visited and sampled monthly. Trays of oysters are often lost through vandalism and other activities in the rivers hence information is missing for some rivers and some years. Fortunately, most watermen recognize and respect test stations and often cooperate by bringing samples and information to the laboratory, Dr. Andrews said.

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VIMS FORECASTS ABUNDANCE OF FISH AND SHELLFISH

Most fish and shellfish which support the Middle Atlantic Coast fisheries will experience a decline in abundance in 1971, according to a forecast from the Virginia Institute of Marine Science.

Striped bass are expected to decline somewhat in abundance but fish will be of good size. This species is rather cyclic, with good broods being produced at intervals of approximately six years. The hatch of young in 1970 appears to have been good. These fish will not enter the fishery in 1971 but promise a good year for pan-size stripers in 1972.

After the near record year for spot in 1970, some decline seems inevitable for 1971, VIMS reports. The fish which supported the fishery in 1970 were mostly two-year-olds. A few of these will still be around next year as 10-inch long fish, but small fish will be scarcer than usual. The result will be only

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(Continued from page 3)

mediocre spot fishing in 1971.

Croaker and grey sea trout probably will continue to increase at the rate experienced in 1970, but the numbers will be far below those of the 1940's when these fish reached the peak of their abundance.

In early spring when the river herring and shad come into Chesapeake Bay and swim up the rivers to spawn, the pound-netters begin their season. In 1969 and again in 1970, the foreign trawlers, mostly Russian, cut deeply into the supply of river herring. VIMS reports that the success or failure of the 1971 season probably will depend largely on the extent to which foreign fishermen harvest this resource which is the backbone of the pound-net fishery.

Shellfish also are expected to experience a decline in abundance, except for the surf clam, which, according to the VIMS report, are expected to increase sharply in 1970.

Catches of hard clams will be about the same as in 1969 since production has declined only slightly since 1963. Production of soft clams has declined sharply since 1965 and no production is expected in 1970.

The prediction for blue crabs is for a smaller than average yearclass available from September 1970 through August 1971. Small crabs hatched in 1970 are already present in Virginia waters, however, and have appeared in such large numbers that the scientists are predicting larger than average supplies for the 12 months beginning September 1971.

There has been a downward trend in abundance of oysters since 1960 and levels in 1970 are expected to be about equal to or slightly less than in 1969.

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OCTOBER OYSTER MEATS QUALITY INDEX

Surveys to determine the condition of oysters in Virginia rivers are directed by Dexter Haven, head of VIMS Department of Applied Biology. Representative stations on public rocks are sampled, beginning at the mouth of each river and proceeding to the transition zone between fresh and salt water. (See maps on page 6 for locations). Samples for the October meats quality index were collected from all rivers during the period from October 8 through October 22.

A substantial increase in meat quality was reported at all stations in the Rappahannock River with the largest change recorded at Hogg House bar at Urbanna. Oysters were rated as above average during September; their substantial increase during October represents a further increase in quality.

Oysters in the James River were rated as average, and, with the exception of Brown Shoals, were the same as during September. In the York River meats were average to above average with an increase in quality over September.

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OYSTER MEATS QUALITY INDEX

	July 1970	August 1970	September 1970	October 1970
JAMES RIVER				
Brown Shoals	7.8	6.7	6.1	5.6
White Shoals	8.4	6.8	6.7	6.8
Wreck Shoals				
shallow	6.6	6.5	6.5	6.6
deep	7.6	6.2	6.2	6.2
Point Shoals	9.6	9.7	9.1	9.3
Horsehead	6.8	6.6	6.7	6.8
Deepwater Shoals	7.2	9.0	8.6	8.6
YORK RIVER				
Green Rock	9.0	8.3	7.9	8.9
Pages Rock	8.9	7.9	6.7	7.8
Aberdeen Rock	9.1	8.3	7.1	7.9
Bells Rock				
deep	8.2	7.2	6.3	7.0
RAPPAHANNOCK RIVER				
Urbanna	10.1	9.1	9.3	12.9
Smokey Point				
shallow	10.0	8.0	N.S.*	9.8
deep	N.S.*	8.9	8.8	9.6
Morattico Bar				
deep	9.7	8.4	8.5	9.8
Bowlers Rock				
shallow	10.1	9.6	8.7	10.0
deep	N.S.*	9.5	N.S.*	10.2

*Not sampled

KEY TO INDEX NUMBERS

3.0 to 5.5 -- Below average

5.6 to 7.5 -- Average

7.6 and up -- Above average

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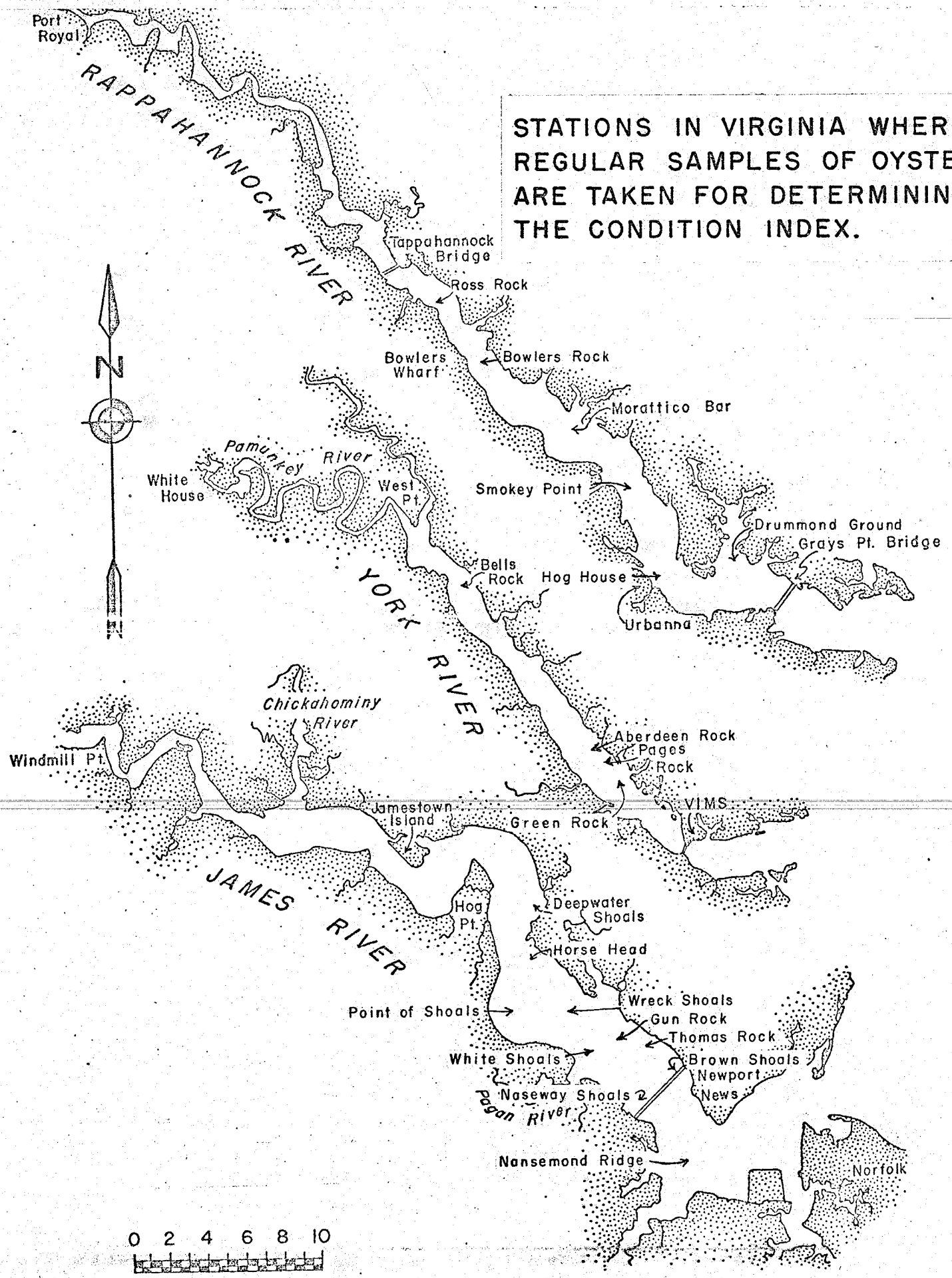
STATIONS IN VIRGINIA WHERE REGULAR SAMPLES OF OYSTERS ARE TAKEN FOR DETERMINING THE CONDITION INDEX.
Port Royal
RAPPAHANNOCK RIVER
Tappahannock Bridge
Ross Rock
Bowlers Wharf
Bowlers Rock
Morattico Bar
Pamunkey River
White House
West Pt.
Smokey Point
Drummond Ground
Grays Pt. Bridge
Bells Rock
Hog House
YORK RIVER
Urbanna
Chickahominy River
Windmill Pt.
Aberdeen Rock
Pages Rock
Jamestown Island
Green Rock
VIMS
JAMES RIVER
Hog Pt.
Deepwater Shoals
Horse Head
Point of Shoals
Wreck Shoals
Gun Rock
Thomas Rock
White Shoals
Brown Shoals
Newport News
Naseway Shoals
Pagan River
Nansemond Ridge
Norfolk
N
0 2 4 6 8 10
NAUTICAL MILES

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Dr. William J. Hargis, Jr., VIMS Director. Robert S. Bailey, Head, Information and Education Department. Editorial staff: David Garten, Editor; Robert S. Bailey and Fred C. Biggs. Jane Davis, Kay B. Stubblefield and Bill Jenkins, Illustrators. Virginia Camechis and Becky Ashe, Typists.