9-24-1969

Marine Resource Information Bulletin Vol. 1, No. 2

Virginia Sea Grant

Virginia Institute of Marine Science

VIRGINIA INSTITUTE of MARINE SCIENCE

TO SHELLFISH INDUSTRY September 24, 1969

JAMES RIVER OYSTERS ESCAPE FLOOD DAMAGE

The threat to oysters in the James River from effects of recent flooding caused by Hurricane Camille is apparently over.

Results of an accelerated water sampling program in the oyster producing area of the river show that the James is recovering rapidly. By Wednesday, August 27th, the salinity over Wreck Shoal reached levels well above the damage point for oyster survival.

The rapid recovery of the James can be attributed to a fast decrease in water levels in the Richmond area, and to high tides coinciding with the fall moon.

During the crisis, the Virginia Marine Resources Commission enlisted the help of area watermen in moving seed oysters to safety further downstream. Oysters were transplanted from public grounds in the vicinity of Deep Water Light to public rocks at Jail Island and Bays Point near Deep Creek.

Oysters were moved because prolonged exposure to water with low salt content causes oyster to stop feeding and die within a few days. The floods caused the James to become completely fresh above Rock Landing Shoals. Normally, the James is salty beyond Jamestown Island.

VIMS is presently concerned about the pesticides and pollutants which washed into the river. Over a ton of DDT and other pesticides are believed to be in the river. The analytical results on oyster samples collected from the James River on 2 September indicated that the pesticide levels in the meats were well below the allowable limits established by the federal regulatory agencies. Harvesting was expected to resume on Monday 8 September.

VIMS will continue an accelerated study program of the James, as well as the York and Rappahannock Rivers and other areas and will later report possible mortalities from fresh water, pesticides, and other pollutants.

SPECIAL NOTE: Heavy losses have been reported by oyster growers in the upper York River as well as in Lower Machodoc and Nomini Creeks in the Potomac River. A bulletin on the extent of the damage will follow shortly.

MSX DECLINES IN SOME AREAS

The microscopic killer MSX, continues to thrive in high salinity areas (above 15 parts per thousand) of Virginia rivers; however, infection and deaths rates were lower than usual in some parts of lower Chesapeake Bay during 1968.

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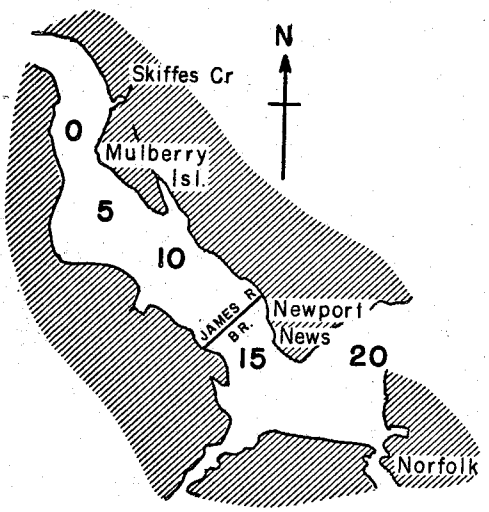
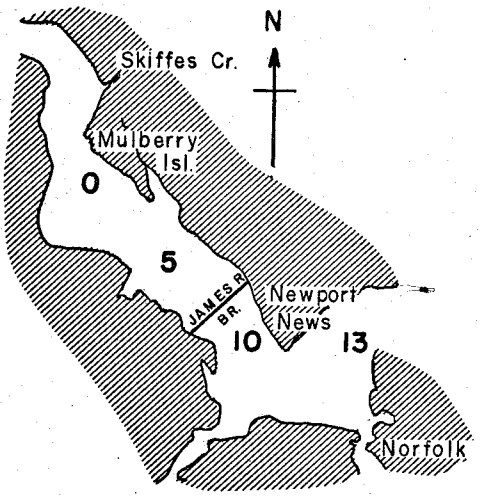
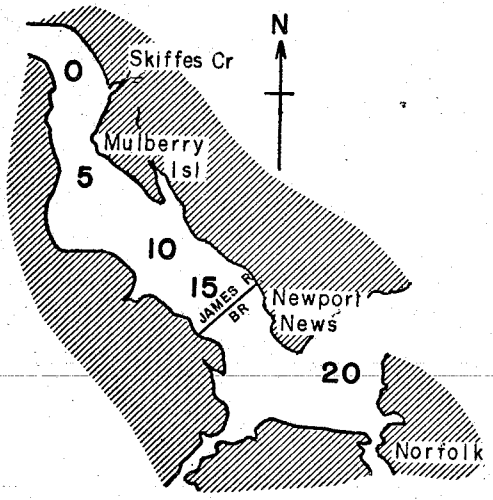


Friday 22 August, 1969

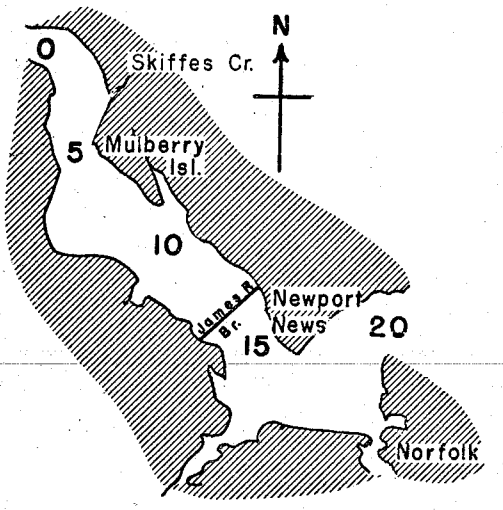


Monday 25 August, 1969

FRESHWATER INTRUSION



Wednesday 27 August, 1969



Friday 29 August, 1969

SALINITY RECOVERY

Fig. 1 Salinity changes in James River caused by flood waters of Hurricane Camille. Salinities measured at 10' depth — slack before ebb tide. Numbers indicate salt content in parts per thousand ($^0/_{00}$). Open sea water averages about 35 parts salt per thousand parts water.

Susceptible oysters (those easily contracting the disease) are placed in trays in various rivers and checked periodically to discover how many contract the disease and to measure death rates. Susceptible seed transplanted to the Rappahannock River, Piankatank River, and Hampton Bar in the lower James River showed fewer MSX infections and deaths in 1968 than usually. Few native oysters were infected with MSX.

However, these findings do not indicate that the disease is disappearing. Previous research has shown that native populations are selected by MSX activity and also that oysters acquire some immunity if exposed to the disease at an early age. Furthermore, 1968 may represent only an annual fluctuation.

Susceptible James River seed imported into the Piankatank River became infected in 1968 even though native seed did not. Susceptible oysters placed in the York River at VIMS in spring 1969 already reveal typical early-summer infections.

August and September are crucial months for losses from diseases. Beds of oysters should be checked frequently. If freshly killed oysters are found in high-salinity areas, they probably died from MSX or Dermocystidium, and more losses can be expected unless they are harvested immediately.

Some losses may be attributable to recent rainfall which produced low oxygen waters over some areas in disease prevalent zones. Thus losses this fall may be attributed to MSX, Dermo, or low oxygen due to poor mixing of surface and bottom waters.

TESTS SHOW SEED OYSTERS CAN SURVIVE IN MSX AREAS

Culturing oysters in MSX areas using methods advocated by VIMS was tested commercially in 1968-69. Seed oysters selected from beds continuously exposed to MSX acquired resistance early in life and resisted MSX successfully until marketable size was reached. These oysters had excellent meats, and no sick oysters were found when marketed.

Essential requirements of the VIMS Program are 1) Seed oysters must be reared in areas where MSX is active, 2) Native oysters are adequate as brood stock to produce resistant seed, 3) Size of seed oysters and the time of transplanting are critical factors in obtaining good survival, rapid growth, and early harvesting.

The test began in April 1968 when oystermen transplanted some 5,600 bushels of stunted shellstrike of the 1965 yearclass from the Piankatank River to Mobjack Bay, the area where MSX is most active.

In the fall of 1968 sampling revealed good growth, good survival and no disease in the oysters.

Oysters were harvested in early April 1969 and sent to a souphouse. These were in excellent condition and gave an exceptionally good return of meats per bushel of oysters. However, yield of oysters per bushel of seed planted was low because of losses to predation and smothering, and poor quality seed (low count per bushel and too many blank shells in dredged shellstrike).

Oysters left on the grounds after harvesting were tested again. In the spring of 1969 no MSX was found and oysters had excellent meats.

This planting in Mobjack Bay, together with the one-load trial planting by the Marine Resources Commission in May 1966, confirms results obtained from tray-oyster experiments and demonstrates that seed oysters can be grown successfully in MSX areas if seed oysters can be obtained from beds where MSX is active and can be planted on good quality growing bottoms.

DISEASE AND CULTURE RESEARCH STRESSED

Dr. Frank O. Perkins, microbiologist promoted in July to head of the Microbiology-Pathology Department at VIMS, says his department will continue to emphasize disease studies of commercially important marine animals and the culture of shellfish larvae and algal organisms. Due to present-day trends toward marine farming both the culture studies and the work on diseases are becoming increasingly important.

Perkins has been using the Institute's electron microscope to learn more about the tiny parts making up the cells of marine pathogens (disease organisms) so that he will know better how they reproduce and grow.

Much of his work is with the organisms responsible for oyster diseases such as Dermocystidium, MSX and SSO. He feels, as other oceanographers do, that an understanding of the life cycle of MSX and other disease organisms is necessary before scientists can suggest better ways to control epidemics.

VIMS Bulletins are prepared and distributed by the Information and Education Department, Virginia Institute of Marine Science at Gloucester Point, Virginia 23062. Work is done in cooperation with the School of Marine Science, College of William and Mary as a project of the Virginia State Technical Services Program under authority of the State Technical Services Act of 1965. Bulletins are mailed to persons licensed to catch, harvest, process and buy seafood, as well as others using or managing the sea for profit or service. Purpose is to inform on matters relating to use, development, and replenishment of marine resources, including scientific studies, technological advances, legislation and problems. Comments and suggestions for items in bulletins are welcomed. References to trade names of commercial products do not imply endorsement.

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