

Reports

3-1-1985

The Virginian Oyster

Dexter S. Haven
Virginia Institute of Marine Science

Herbert M. Austin
Virginia Institute of Marine Science

Follow this and additional works at: <https://scholarworks.wm.edu/reports>



Part of the [Aquaculture and Fisheries Commons](#)

Recommended Citation

Haven, D. S., & Austin, H. M. (1985) The Virginian Oyster. Marine Resource Report No. 85-4. Virginia Institute of Marine Science, College of William and Mary. <https://dx.doi.org/doi:10.25773/v5-bgt9-v819>

This Report is brought to you for free and open access by W&M ScholarWorks. It has been accepted for inclusion in Reports by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

THE VIRGINIAN OYSTER

by

Dexter S. Haven

and

Herbert M. Austin

Department of Fisheries Science
Virginia Institute of Marine Science
College of William and Mary
Gloucester Point, Va. 23062

Prepared for the
FISHERIES MANAGEMENT ADVISORY COMMITTEE
to the
Virginia Marine Resources Commission

Virginia Marine Resource Report 85-4

THE VIRGINIAN OYSTER

NATURAL HISTORY

The American oyster occurs along the Atlantic and Gulf coasts. It is a suspension feeder, filtering small particulates from the water. An adult oyster is capable of filtering four gallons of water per hour.

Reproduction

The sexes of the oyster are separate, and both reach sexual maturity by their second growing season. Mature females 3 to 4 inches long may produce up to 6 million eggs each year; smaller sizes may produce 100,000 or less. An unfertilized oyster egg is about 40 microns, or 1/500 inch, the size of a medium sized pollen grain.

Fertilization of the eggs by sperm occurs in the water; in other words, fertilization is external and dependent upon water currents and the proximity of male to female to insure fertilization. Spawning occurs in the lower Chesapeake Bay from mid June to October.

Growth and Development

Fertilized eggs quickly develop into weakly-swimming larvae which are widely scattered by the currents during their 10-14 day pelagic phase. These earliest stage larvae are called trochophores (Figure 1). Later, as they begin to look like a bivalve they are called veligers (Figure 1). The late stage larvae, about 1/50 of an inch across, the size of a dust particle, are called pediveligers (Figure 1). At this stage they sink to the bottom and are ready to attach or "strike" to a hard object (preferably another oyster shell).

Spat

After permanent attachment, a young oyster is called a spat. Spat (by the end of 1 week of growth) are about 1/25 inch (1 mm). By the end of the season they are between 1/2 and 1 inch in length. During the next year, their first full growing season, they reach 1 to 2 inches. Spat are very susceptible to crowding and predation, and consequently mortality is very high during their first season of growth, sometimes reaching 90%.

THE FISHERIES

Seed Oyster

Seed are juvenile oyster ranging from about 1/2 to 2 1/2 inches (1 to 3 years). These are transferred from a good setting area, such as the James River, to areas where setting is poor but where growth is good. These growing areas will usually not produce a good crop unless

"seeded". Such areas include those too far up river into fresh water for the larvae to survive, areas without a hard substrate for setting, or areas which do not receive a natural set.

A bushel of seed oyster sold by tongers working in the James River may contain from 500 to 800 seed 1/2 to 2 1/2 inches. These are largely 2 to 4 years old. Counts of current year spat on seed are generally not considered in these counts. A careful buyer can increase his count by as much as 1000 seed per bushel if he buys seed with a good spat count.

Counts of oysters of various sizes range from thousands of spat on a bushel of shell to 250-280 market oysters per bushel. The following table is an average count of the various sizes.

Market oysters	250-280/Bushel
Seed	500-800/Bushel
Small	1000-1200/Bushel
Yearlings	1500-2000/Bushel
Spat	Several thousands

Generally, a bushel of seed oysters, planted in Virginia's rivers will yield one bushel of market oysters two to three years later. A bushel of seed, in 1985 dollars, cost \$3.50-3.75 to purchase and plant. This bushel will yield \$12-16 on the market.

Market Oysters

Oysters usually reach market size (3 inches or more) in 3 to 5 years after setting depending on where they are growing. They grow faster in high salinity waters than in low salinity areas. Higher salinity waters however, are where most oyster predators and MSX are found.

Too many, too close together grow long and skinny. These are called "cats paws" and are of poor quality. Rapidly growing oysters have a paper thin outer shell margin which breaks easily. They are called "snappy" when in this condition.

In the market, shucked oysters are graded according to size, and identified as follows.

Standards	300 and up/gallon
Selects	210-300/gallon
Extra selects	160-210/gallon
Counts	160 or less/gallon

OYSTER BEDS

Public (Baylor Ground) and Private Grounds

There are about 242,000 acres of public oyster grounds in Virginia (Figure 2). They were surveyed and set aside for public use in 1894.

They are named after Navy Lt. J. B. Baylor, who was loaned to the Coast and Geodetic Survey, and who conducted the original survey.

Areas outside the Baylor Grounds, and those not assigned by the State for other purposes, may be leased from the VMRC by private growers. These leases are termed private ground. In 1982 there were 108,602 acres so designated.

Prior to 1960 the some 100,000 acres of private grounds produced over 20 million bushels of oyster annually (Figure 3). The over 240,000 acres of Baylor Grounds produced some 5-10 million. Following the sudden decline in 1960, the private grounds produced only around 5 million bushels, as did the Baylor Grounds. This reduction is due in part to MSX invading the more saline private grounds in the low Bay, and, it has been suggested, the introduction of chlorine.

The Seed Beds

The James River is the principal source of seed oysters in Virginia, as some 444,325 bushels were harvested during the 1982-1983 season. Seed from the James are generally transported by truck or boat to other rivers, such as the Rappahannock, and planted.

Seed oysters are also produced in lesser quantities from the Great Wicomico and Piankatank rivers. The Virginia Eastern Shore also produces seed, but this is largely used in that area.

PREDATORS AND DISEASES

MSX, a protozoan disease, entered the Delaware Bay in 1958 and spread to the Chesapeake Bay in 1960. It killed millions of bushels of oysters in high salinity waters in both areas. This intercellular protozoan is still in the Bay and causes excessive mortalities where fall alinities exceed 15 ppt.

Dermo, another disease, has always been in the Bay. It causes scattered mortalities in the high salinity water during late summer in crowded populations.

Drills are small snails that kill smaller oysters by boring a hole through the shells. Their distribution is limited to salinities higher than 15ppt. They were almost eradicated from some parts of the Bay by the freshwater flows of Hurricane AGNUS.

Blue crabs, are a particular threat to the spat of each year's crop. A small flat worm, and the mud crab are also two spat predators.

Fish, including red and black drum, and cow-nosed rays eat large and small oysters. An "invasion" of cow-nosed rays during the late 1970's decimated some private plantings in the Rappahannock River.

FIGURES

1. Life cycle of the oyster. From Haven and Burrell, 1982
2. Baylor Grounds of Virginia. From Haven, Hargis and Kendall, 1978
3. Oyster landings in Virginia. From Haven, Hargis and Kendall, 1978

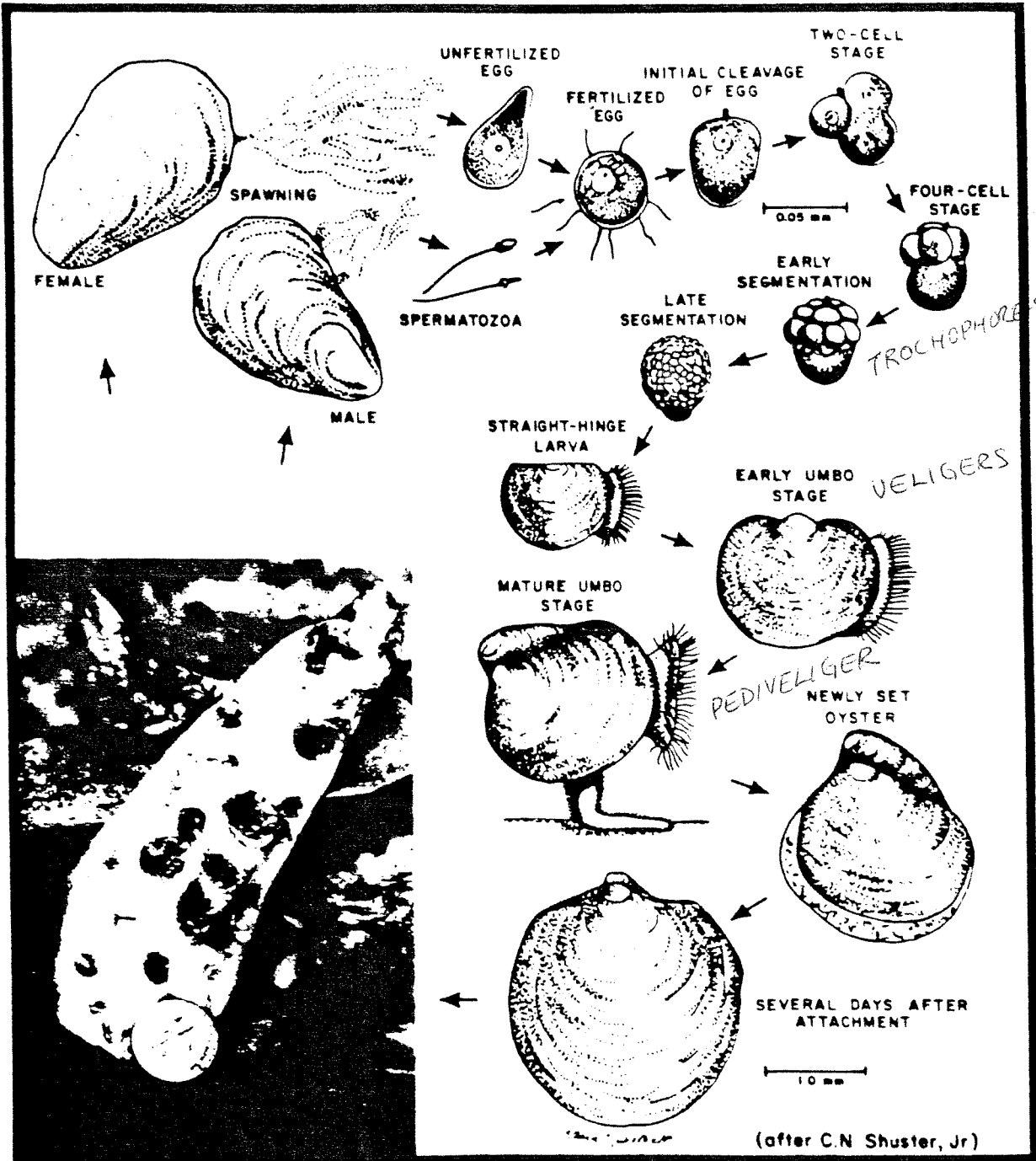
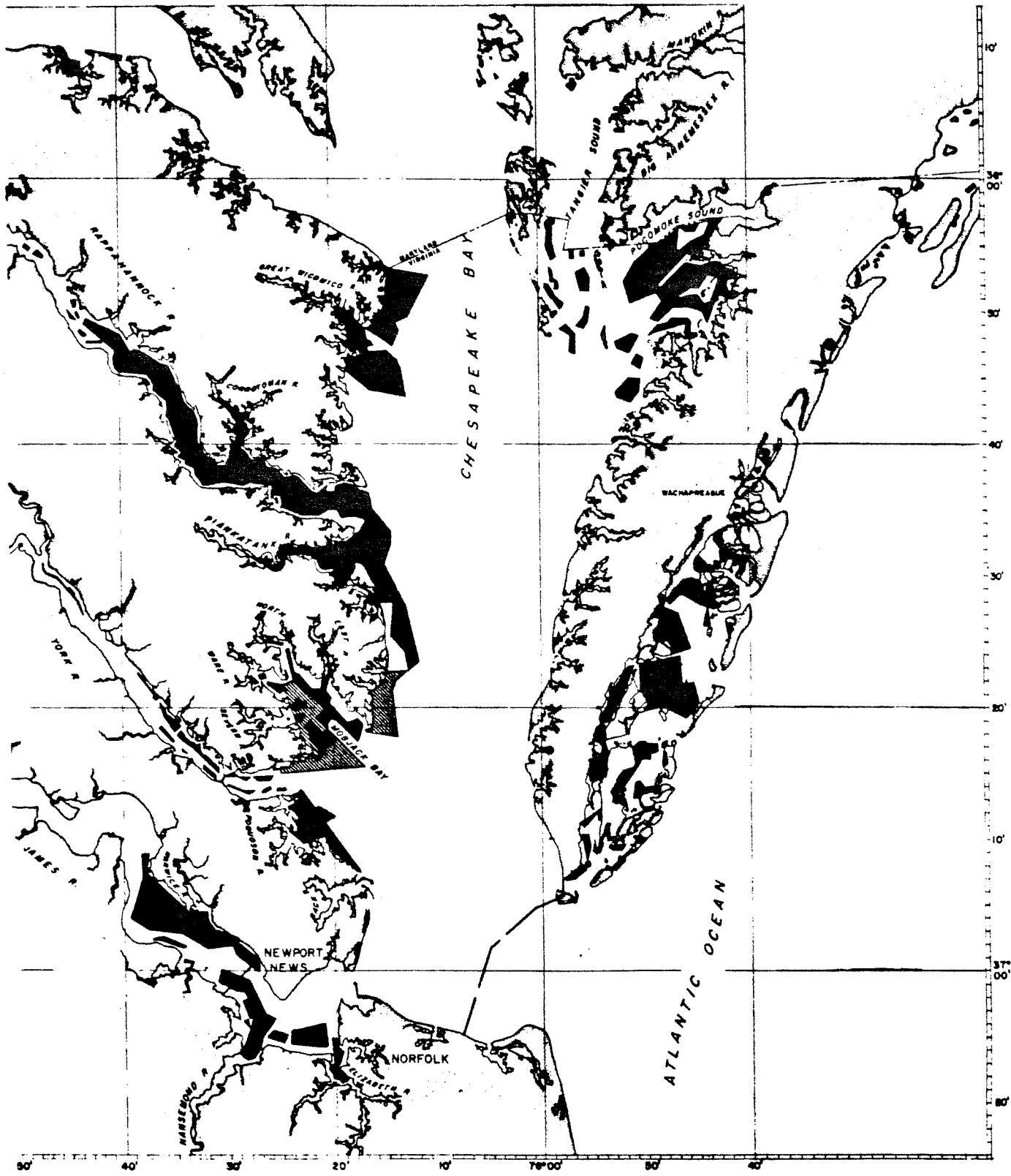


Figure 2



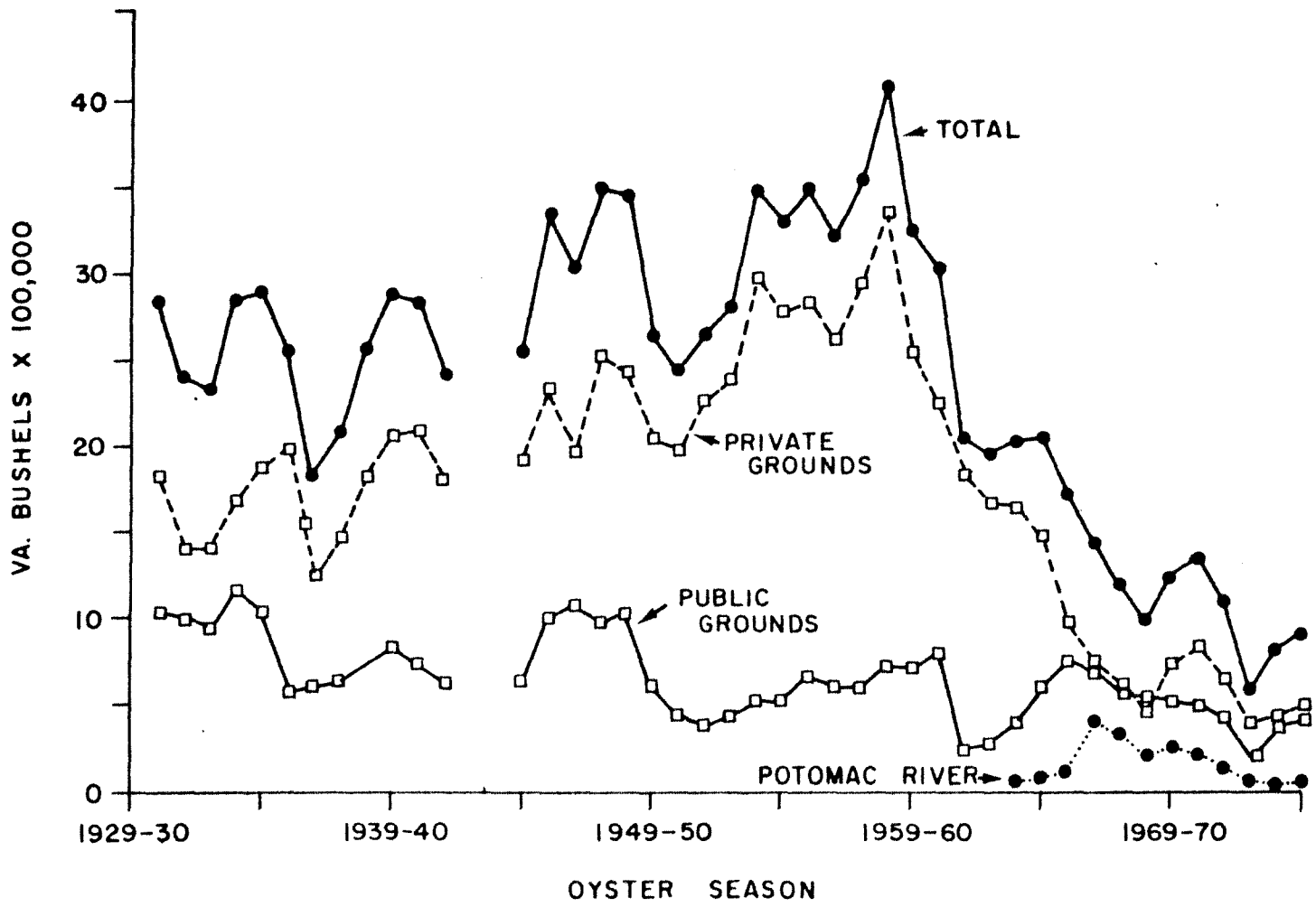


Figure 3