

MAINE OYSTERS



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INTRODUCTION

The American or Eastern oyster (*Crassostrea virginica*) is a bivalve shellfish native to Maine bays and estuaries. Today, oysters are produced primarily via aquaculture, a \$5 million industry that is part of the working waterfront and supports hundreds of Maine families.

Read on to learn more about Maine oysters.

HISTORY

Ancient shell heaps (or middens) and fossil oyster shells are evidence that oysters were once much more widespread in Maine.

For a time after the ice sheet melted, the boundary between land and sea was lower than it is today. The Gulf of Maine was a shallow, tide-less lagoon with much warmer water. Such conditions allowed “temperate” fauna like oysters, which had taken refuge in areas to the south not covered by ice (around present-day Virginia), to expand their range. Ten-thousand-year-old oyster shells have been recovered from Georges Bank and the waters around Mount Desert Island.

Then sea levels rose, tides developed, and the Gulf cooled, restricting oysters to isolated pockets where habitat remained suitable: the upper reaches of narrow, “current-swept” estuaries like the Piscataqua, Damariscotta, and Sheepscot rivers. There, the water stayed warm enough for the strongest oysters to spawn and survive, and was fresh enough to keep out most marine predators.

Two to three thousand years ago, the native Wabanaki people harvested large numbers of oysters, leaving behind giant middens (piles) of discarded shells. Then something happened and the oysters began to disappear. Harvesting may have been a contributing factor, but scientists also have proposed that oysters suffered from continuing sea-level rise, which brought in colder water and/or marine predators. And after European colonists arrived, their brickyards, sawmills, forest clearing, and pollution also played a role in eliminating oyster habitat.



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Remnant populations survived into the twentieth century. The relict oyster beds provide habitat for other species that became established at the same time: mud crabs, scuds, beach hoppers, and other tiny crustaceans. Because these wild oysters have been isolated for so long, they may have evolved unique traits for survival.

The historic and persistent presence of oysters in Maine waters inspired attempts to bring them back in the middle of the twentieth century.

INDUSTRY

In 1949, the Department of Sea and Shore Fisheries (predecessor to the Maine Department of Marine Resources) began efforts to re-establish oysters in Maine. Initially, fisheries managers focused on European or “flat” oysters, *Ostrea edulis*, because of their market potential and because Maine was one of the few places on the Atlantic Coast cold enough for European oysters to survive. The State imported them from Holland, screened them for disease and parasites, and planted them in Basin Cove, Harpswell, Boothbay Harbor, and the Taunton River in Franklin. More were introduced to additional Midcoast locations in 1954.

The experiment didn’t take off the way the agency had hoped, because Maine waters were too cold, and lacked the hard bottom oysters need to establish beds. However, a few hardy individuals did take hold and became self-sustaining populations in the Midcoast region.

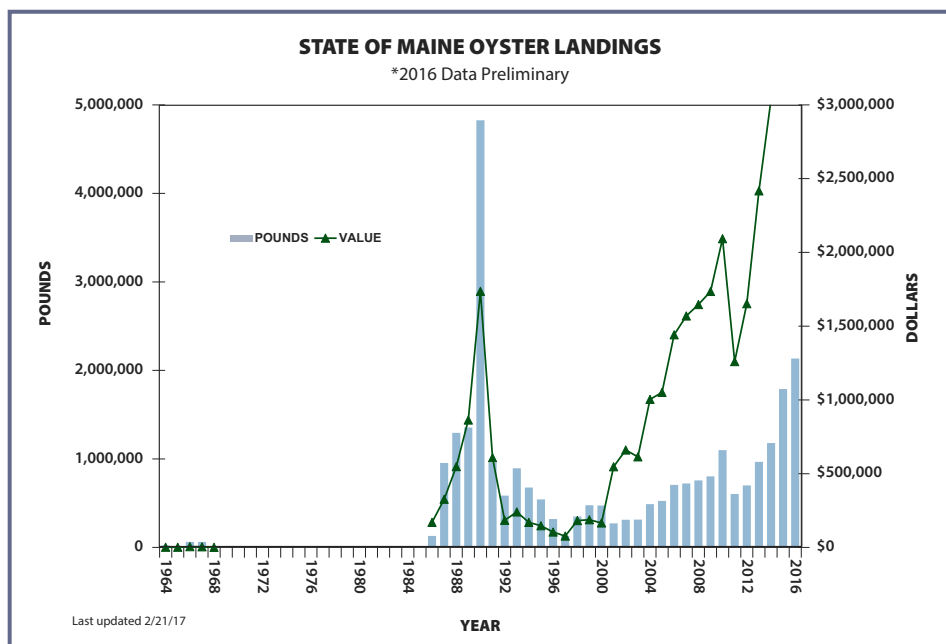
In 1972, Herb Hidu, a professor at the University of Maine, began investigating the cultivation of oysters in Maine waters, along with Ed Myers and other entrepreneurs. With funding provided by Sea Grant (in fact, the very first Sea Grant funding in Maine), Hidu developed methods to culture the European oyster in the Damariscotta River adjacent to the University’s Darling Marine Center. Experiments were successful, until the parasite *Bonamia* arrived in the mid-1980s and wiped out almost all of the European oysters.

With the European oysters devastated by disease, Hidu and the next generation of students reconsidered the native species and continued their research into the 1990s, this time focused on *Crassostrea virginica*. Many students earned graduate degrees studying ways to breed oysters that grew faster and were better adapted to Maine’s cold waters; some of them went on to start their own aquaculture companies.

Maine’s oyster companies are small, owner-operator businesses. Each “farmer” can have multiple lease locations. Today, some 80 leaseholders using 600 acres of state waters annually produce about 2 million pounds of oysters.



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Several commercial hatcheries around the state raise baby oyster “seeds,” also called spat, from a speck the size of a grain of sand to quarter-inch size, which growers then purchase and set out in leased areas of coastal waters.

Oysters need flowing water in order to filter out food particles. Oyster farmers put their seed in plastic mesh bags or cages that float on the water surface; some growers use “up-weller” bins in quieter waters for the early stages of growth.



BOTTOM CULTURE

Growers spread oysters below low tide, over firm bottom areas with food availability, good water temperatures, the correct flow rate and sediment type, and limited predation. During harvest time, farmers will often work the beds with specialized drags, or sometimes rakes or via SCUBA diving.



SUSPENSION CULTURE

Shellfish bags come in many shapes and sizes, but most often are hung on the surface in long paired lines. Cages are rotated by hand to keep marine organisms from “fouling” the surface. Submerged cages or bottom-culture areas are marked with buoys.

The oysters “grow out” for two to three years until they reach market size. In the wintertime, oysters are either set in cages on the bottom, kept in refrigerated storage until the next growing season, held in floating rafts in an ice-free area, or, if they are large enough, they are seeded directly to the bottom for final growout.

Cultured oysters are tended and closely monitored. Many growers move their product to locations farther from shore before harvesting to let the oysters filter-feed in cooler, saltier water.

RACK AND BAG CULTURE

Since oysters can easily withstand being in the open air for several hours each tide, one common way of growing oysters is to place them in the intertidal zone where

they regularly air dry. This keeps biofouling to a minimum, and provides easy access for harvesting and maintenance. Rack-and-bag systems are typically metal or plastic frames that sit on the seabed, with bags of oysters connected with bungee cords or rubber straps. Periodically, farmers will flip the bags over.



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ECOLOGY

Eastern oysters are native to the East and Gulf Coasts of North America.

A filter-feeding bivalve mollusk, oysters grow in warm water (ideally above 70 degrees Fahrenheit) and can withstand wide swings in salinity. Oysters feed by filtering algae and other particles from



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the water, and so they take on the characteristics of the place where they live. The taste of oysters varies from river to river depending on what kind of algae they eat, and the temperature and salinity of the water. In colder regions like Maine, oysters filter water more slowly, and so they have more time to rest in their shell and develop the flavor of their home.

Water quality is one of the biggest concerns of the oyster farmer. While the filter-feeding oysters themselves actually help to keep the water clear, pollution and harmful algal blooms (“red tide”) can shut down oyster growing areas for months. But if oysters are on the menu, they are safe to eat.

The Maine Department of Marine Resources monitors for toxins between April and October and for bacteria year-round.

For more information, visit maine.gov/dmr/shellfish-sanitation-management/index.html

CONSUMER INFORMATION

Maine oysters are available year-round. Some consider fall and winter to be the “peak” season, however, as Maine oysters prepare for a sort of hibernation during the winter months by storing glycogen, which makes them fat and sweet. The cold also keeps away the diseases that plague oysters of more southerly waters.

Keep oysters cold! Purchased oysters should be stored in the refrigerator, packed loosely and covered with a damp towel. Eat within 14 days.

Eating raw oysters presents some risk of exposure to viruses and bacteria, especially for people with compromised immune systems.

Growers sell their oysters under different “brands” or trade names, usually related to the location. Some Eastern oysters that originated as aquaculture product have “naturalized” or become self-sustaining in the Damariscotta River. A handful of licensed harvesters collect and sell them as “wild” oysters.

For an updated list of Maine oyster companies and names, visit oystertrailmaine.com.



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