

History of the Bay Scallop, *Argopecten irradians*, Fisheries and Habitats in Eastern North America, Massachusetts through Northeastern Mexico

Preface

This is a broad historical overview of the bay scallop, *Argopecten irradians*, fishery on the East and Gulf Coasts of North America (Fig. 1). For a little over a century, from about the mid 1870's to the mid 1980's, bay scallops supported large commercial fisheries mainly in the U.S. states of Massachusetts, New York, and North Carolina and on smaller scales in the states in between and in western Florida. In these states, the annual harvests and dollar value of bay scallops were far smaller than those of the other important commercial mollusks, the eastern oysters, *Crassostrea virginica*, and northern quahogs, *Mercenaria mercenaria*, but they were higher than those of softshell clams, *Mya arenaria* (Table 1). The fishery had considerable economic importance in the states' coastal towns, because bay scallops are a high-value product and the fishery was active during the winter months when the economies in most towns were otherwise slow. The scallops also had cultural importance as a special food, an ornament owing to its pretty shell design, and an interesting biological component of local bays.

Perhaps the tastiest of the marine bivalves, bay scallops have been a favorite seafood for people, especially along the eastern seaboard. The only part eaten is their single large muscle. As the muscles appear in markets, they are nearly white, nearly an inch (25 mm) in diameter and a little over an inch (30 mm) long, with flat ends (Fig. 2). Women have liked eating them in part because their meat is white and various additional organs are absent in servings (Anonymous, 1895). Since

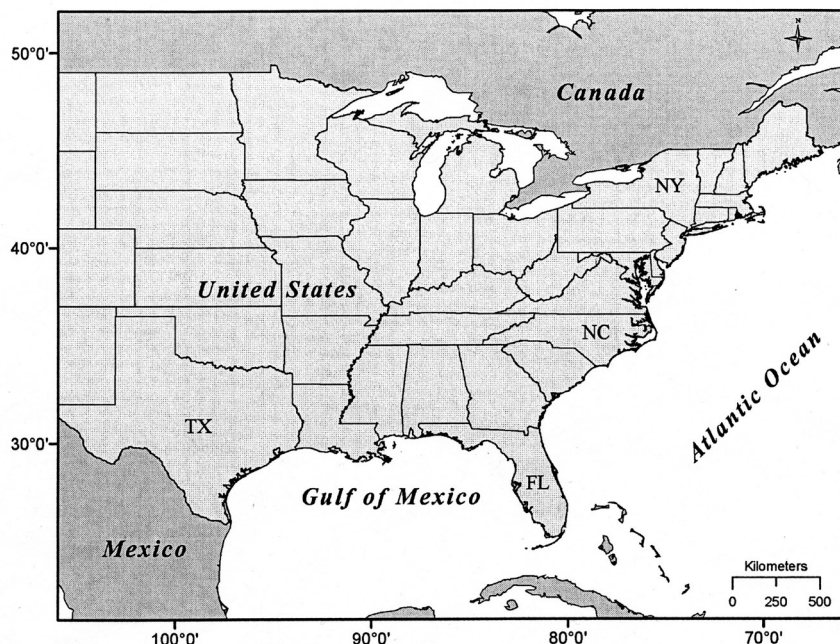


Figure 1.—The distribution of bay scallops, *Argopecten irradians* spp., is from Cape Cod, Mass., to the mid coast of eastern Mexico.

the muscle is the only part eaten, there have been few problems with consumers becoming ill from bacterial or viral diseases. Besides, the scallops were handled in the coolest months when the bacteria and viruses are scarce. The remaining organs (the “guts” or “rims”) of bay scallops are edible and tasty, but some are nearly black and have such an unappetizing appearance they are rarely eaten.

Ingersoll (1887) wrote, “Bay scallops possess an indefinable lusciousness not possessed by any fish or fruit, yet approximating a combination of them all. They are good boiled and pickled,

Table 1.—Average commercial landings/yr during the 1950's of oysters, northern quahogs, bay scallops, and softshell clams from Massachusetts to North Carolina (NMFS landings statistics).

Species	Bushels	Landed value (\$)
Eastern oysters	9,137,000	23,870,000
Northern quahogs	1,606,000	6,900,000
Bay scallops	222,000	1,150,000
Softshell clams	156,000	1,070,000

but much better fried; many, however, do not like their particular sweetness, which is something like the flavor of a fried softshell clam, but much more cloying and satisfactory. When broiled and stuffed with forcemeat and served in

their own shells, they form an ornament on the table.” Parloa (1882), an author of cookbooks in the late 1800’s, noted that bay scallops were not quite as popular as clams because their taste was too sweet and strong.

Bay scallops are comprised of three subspecies over their range. The northern bay scallop, *Argopecten irradians irradians*, ranges from Cape Cod, Mass., to New Jersey where it intergrades between New Jersey and Maryland with the southern bay scallop, *A. i. concentricus* (Clarke, 1965; Waller, 1991), which lives from there down the south Atlantic Coast, around Florida, and westward to the Mississippi Delta. The valves of *A. i. concentricus* are more convex and are thicker and harder than those of *A. i. irradians*. The third subspecies, the Gulf bay scallop, *A. i. amplicostatus*, ranges from the Mississippi Delta to the mid coast of México (Broom, 1976).

Each subspecies lives for about 18–30 months. Just two year classes, the adults and the seed (juveniles), are present in the beds.¹ Annual recruitment of juveniles is highly variable, and thus the abundances and landings of market-sized bay scallops have been highly variable from year to year in each of the various bays (Belding, 1910; Blake and Shumway, 2006). Bay scallops inhabit beds of hard sand in the bays from Cape Cod through Barnegat Bay, N.J., and in North Carolina the bed sediments are firm mud. Scallops are most abundant in grass meadows, especially eelgrass, *Zostera marina*, in the northeast, but they can be found on bottoms free of grasses.

Commercial-scale harvests of bay scallops began later than the harvests of oysters and clams, mainly because they inhabit deeper waters, 3–15 ft (1–5 m), and were not as available to fishermen as the others were along bay shores. During the late 1850’s, their harvests on a commercial scale began to become established, though slowly at first, when the infrastructure associated with oyster

¹Conant, K. L., and T. L. Curley. 2006. Nantucket nub scallops, *Argopecten irradians*, overwinter twice and spawn for the first time at 21–22 months of age. Unpubl. Rep. Mar. Coastal Resour. Dept., Nantucket, Mass., 25 p.



Figure 2.—The white adductor muscles in a plastic pan after the scallops were opened in eastern Long Island, N.Y. Photograph courtesy of Debra Barnes, New York State DEC.

and northern quahog fisheries was being developed. Railroad lines were expanding then, passing by seaside towns, where fish sellers could load and ship bivalves on trains heading to population centers. The natural ice industry developed a couple of decades later, and it provided ice to preserve the bivalves during railroad transits (Jones, 1984).

Bay scallops from Cape Cod through Long Island, N.Y., have been harvested in tightly-regulated seasons that ran from fall and winter through March, a time when the adult scallops had already attained their full growth and, due to the cold water, were nearly dormant on the bottom. This makes them easier to harvest than if they were active because they can swim away from harvesting gear in warm water. The legal season in North Carolina is from December or January into May. The seasons everywhere often lasted 2–8 weeks for most fishermen, because the bulk of the season’s scallop crop was harvested by then. In the seasons when the scallops were in high abundance, as much as 10–50% of the labor force in some of the smallest coastal towns was employed in the fishery, mostly as fishermen and openers, and at least 1,000 fishermen in Massachusetts and 300–500 in both New York and North Carolina harvested bay scallops. The harvests brought the



Figure 3.—The fishermen are happy at the beginning of a good season, mainly because their earnings are good, Katama Bay, Edgartown, Martha’s Vineyard, Mass., 1950. Photograph by C.L. MacKenzie, Jr.

fishermen their highest weekly earnings of the year (Fig. 3), as the monetary return per unit of their effort was high. The scallops also have been harvested as a recreational pastime especially in recent decades in some states including Florida.

The overall range of the bay scallop fishery is not continuous. The coastal environments of South Carolina and Georgia are not suitable for supporting many scallops. The west coast of Florida had a limited commercial fishery for bay scallops until they became too scarce in the early 1990’s. Florida then prohibited further commercial harvesting and promoted recreational harvesting, which has been popular for tourists (Fig. 4). Along the Gulf Coast from Alabama into Mexico, bay scallops were harvested to a limited extent only in Texas and northeastern Mexico. Separate articles on those states are listed below.

Since 1985, bay scallop abundances and landings have fallen sharply, and in the 2000’s commercial fisheries for them barely exist in many once-productive bays (Fig. 5). Commercial bay scallop fisheries of some magnitude exist only in a few places, such as on Martha’s Vineyard and Nantucket, Mass., and even they have had sharp declines. Some papers in this series will attempt

to explain the reasons for the declines. The abundance of bay scallops may be an indicator of the abundances of the other species of invertebrates that also occupy the same bays. Will the bay scallop fisheries return to their former sizes? The answer lies in whether the quality of habitats improves to support more scallops.

The Scallop use in Ancient History

The design of the scallop shell has been used as a decoration and symbol since ancient times. In 1957, the Shell Transport Company, LTD, published a 135-page book titled, "The Scallop, Studies of a Shell and its Influences on Humankind," as a celebration of the company's Diamond Jubilee (Cox, 1957). Of the book's eight chapters, five discuss the shell as a decoration and symbol. The remaining chapters describe the general nature of the scallop, its biology, and its use as a food. The chapters on the use of its shell over several centuries are described below.

A Symbol in Ancient Times, by Mortimer Wheeler

The art of the ancient world is strewn with scallop shells. A myriad of scallop motifs appear in Hellenistic and Roman terra-cotta, metalwork, painting and carving. One example is a long series of representations of the birth of Aphrodite (Venus) from a shell. The earliest known example of the architectural use of the scallop shell motif is dated by an inscription to the year 87 B.C.

The scallop motif was used to illustrate a wide range of art between the 4th century and the 5th or 6th century A.D. in lands included within the Roman Empire. Many flasks and other vessels of earthenware or glass sometimes assumed the form of the scallop. It also decorated Roman gravestones and coffins.

The Badge of St. James, by Christopher Hohler

St. James, in life, was a fisherman and one of the 12 apostles. After the death of Jesus Christ, St. James undertook the evangelization of Spain. In death, he became the patron saint of Spain and



Figure 4.—Family and friends harvesting bay scallops in the wading waters of St. Joseph Bay, Fla. Photograph courtesy of Port St. Joe Dept. of Commerce.

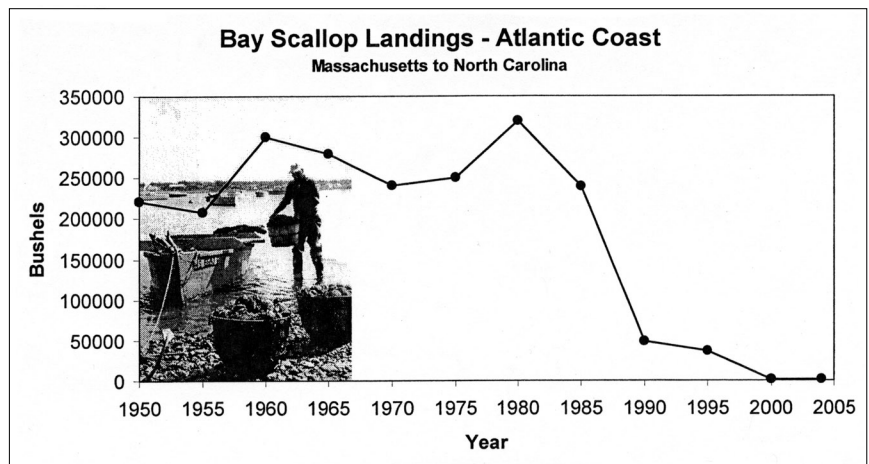


Figure 5.—The landings of bay scallops, *Argopecten irradians irradians* and *A. i. concentricus*, Massachusetts to North Carolina. Insert, landing bay scallops in Fairhaven, Mass., early 1950's.

also of religious pilgrims, and the scallop shell was his symbol. Religious pilgrims traveling to the shrine at Santiago de Compostela where he was buried wore the scallop shell motif on their hats; the first sign of this was in about 1130 A.D. It was a mark of devotion and it signified that the pilgrims had really traveled to the shrine. Pilgrimages to the shrine have been made from distant points in Europe. The scallop shell motif

in every statue, painting, stain-glass window shows that St. James represents an invitation to visit his grave.

The Cradle of Venus, by James Laver

With the Renaissance in Europe (1300's–1600's), the scallop symbol became a decorative motif to be used without any special significance. The most famous of the representations is

Botticelli's Birth of Venus. The use of the shell design became commonplace in painting and in architecture and was used in the minor decorative arts all over Europe. Commonly used as a background in fountains, it was imitated in precious metals and used as a decorative motif.

Escallops in Armory, by George Bellew

Depictions of scallop shells have occurred in armorial bearings since the beginning of heraldry. The earliest ones appear on seals and in rolls of arms about 700–800 years ago. Since then, they have consistently occupied a prominent place. Various fraternities of knights and orders of chivalry used scallop shells as a badge in various ways. In heraldry, the scallop shell is nearly always depicted with the beak (open end) uppermost. This may be because it was commonly seen in that position attached to the uppermost raiment of pilgrims.

An Excursion into the Americas, by Adrian Digby

The scallop shell was used on drawings and vases by the Native Americans of South and Central America. From the earliest times and in isolation from Europe, they derived much of the same sort of stimulation from the scallop as did their contemporaries in the Old World. In modern times, the scallop shell design is used to decorate a broad range of objects including store signs, napkins, and gravestones.

Scope of This Treatise

Parts I and II cover the bay scallop, *Argopecten irradians* spp., over its entire range along the east coast of North America from the Canadian Maritimes to the mid coast of Mexico. Descriptions of its biology, autecology, scallop usages by Native Americans, a history of its fishery, insults to the scallops' environments, and restoration efforts are included. A paper on eelgrass describes its role as an extremely important component of the bay scallop habitat, and another on geomorphology describes how the inlets and bottom

morphologies of bay scallop estuaries have changed through time. When inlets have widened, scallops usually have become more abundant and vice versa. The final paper describes the history of the Massachusetts shellfish officers (wardens) service. A Shellfish Officer Service exists in all coastal states and it has the primary goal of conserving the shellfish stocks and abundances. Its history in this series is the first to be written. Papers on some other habitat components that likely have a substantial role in governing abundances of bay scallops, i.e. water chemistry, phytoplankton, and such predators as crustaceans and finfishes could not be included due to a lack of specific information on their relationships to scallop populations. Altogether seven papers are included, each written by scientists with expert knowledge gained over a long experience with studies of the subjects they cover.

Paper 1.—The Bay Scallop, *Argopecten irradians*, Massachusetts Through North Carolina: Its Biology and the History of Its Habitats and Fisheries, by Clyde L. MacKenzie, Jr.

This paper covers the bay scallop fishery from Massachusetts through North Carolina, the principal harvesting area. The biology and habitats of bay scallops, descriptions of improvements in historical harvesting gears, historical landings and fisheries in each state, and many photographs of the gear, harvesting, and processing are included. The sharp declines in scallop landings after the early 1980's and efforts to restore the bay scallops are also described.

Paper 2.—The Bay Scallop, *Argopecten irradians*, in Florida Coastal Waters, by William S. Arnold

The historical importance of the bay scallop as a commercial and recreational shellfish in Florida coastal waters is described. A review of the biology and habitats of bay scallops, the declines in abundance, and the efforts to restore the scallop populations are included.

Paper 3.—Bay Scallops, *Argopecten irradians concentricus* and *A. i. ampli-*

costatus, in the Northwestern Gulf of Mexico (Alabama, Mississippi, Louisiana, and Texas), by Kim Withers and Matt Hubner

Scallops, *Argopecten irradians ampliocostatus*, here are widely distributed but too scarce to support fisheries nowadays. This paper emphasizes the presence of bay scallop shells in Indian shell middens in Texas, and describes brown tides along the coast of the U.S. Gulf of Mexico.

Paper 4.—The Bay Scallop, *Argopecten irradians ampliocostatus*, in Northeastern Mexico, by Armando T. Wakida-Kusunoki

Though not plentiful here, the distribution of the bay scallop, *Argopecten irradians ampliocostatus*, and its habitat in northeastern Mexico are described. The paper also includes usage by prehistoric Indians and current harvesting methods and markets of the bay scallops.

Paper 5.—Eelgrass, *Zostera marina*, as Bay Scallop Habitat, by Mark S. Fonseca and Amy V. Uhrin

The biology of eelgrass including its life history, seasonal growth cycle, and adaptation to its habitat, and the relationship of bay scallops to eelgrass meadows are described. In addition, the historical distribution of eelgrass, the effects of the wasting disease in the 1930's, and efforts to restore depleted eelgrass meadows are included.

Paper 6.—The Changing Geomorphology of Estuarine Inlets, Atlantic Coast of the United States, by Norbert Psuty and Tanya Mendes Silveira

The sizes and shapes of inlets and sand bars in bay scalloping bays have played a huge role in the sizes of scallop crops that the bays can support. The paper provides examples of how the inlets and sand bars have been modified through history.

Paper 7.—History of the Shellfish Officer Service in Massachusetts, by Henry Lind

The Shellfish Officer Service in each coastal state has the important role of

enforcing conservation rules and carrying out some shellfish restoration practices. The officers in Massachusetts oversee fishermen's catches of bay scallops, quahogs, softshell clams, and oysters.

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- Clyde L. MacKenzie, Jr.
James J. Howard Marine Sciences
Laboratory
Northeast Fisheries Science Center
National Marine Fisheries Service, NOAA
74 Magruder Road
Highlands, NJ 07732