BOSTON BY FOOT

THE WATERFRONT

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MEETING PLACE: Under the Arch at Rowes Wharf 50 Rowes Wharf Boston, MA 02110

INTRODUCTION: New England has a great seafaring heritage, yet surprisingly it is the result of acquired skills rather than long tradition brought over from the Old World. In the early colonial years, Boston was dependent on ships from England for supplies, but it was not a reciprocal trade arrangement. Its rocky soil did not foster agrarian efforts and the region produced little that Britain required. Therefore, New Englanders had to exchange their wares with other colonies to obtain products that did command a favorable market in England. The deep, natural channels of Boston Harbor, the nearly 4,000 acres of sheltered anchorages in and around the Harbor's islands and Boston's close proximity to fine fishing grounds soon enticed the more enterprising to turn to the sea for their livelihood. The West Indies welcomed New England fish and timber. In return they exported molasses and raw sugar. These could be traded in the Mid-Atlantic colonies for wheat/flour, pig iron and bar iron. Ships were the tools of trade, used like floating department stores (unlike their more common function now as freight movers) with captains and agents often bartering goods right on board. Ocean trade and its related industries would have a great impact on the growth of Boston and the shape and character of its waterfront.

By the 1790s, Boston's original waterfront was substantially 'wharfed out' with almost 20% of the Town's built environment in the form of piers and related structures. Maritime industries were thriving and promised continued growth. As the 1800s dawned, the 'filling-in' of Boston began in earnest on the waterfront. Shallow bays and inlets were filled with dirt brought down from Beacon Hill and other lofty points, allowing docking facilities to be expanded and modernized.

Today, Boston's maritime industries include cargo transport, seafood processing, ship repair, and tourist-related businesses such as Harbor and whale watch cruises. One industry not present is fishing, which was so important in Boston's early days when nearby fishing grounds were rich with halibut, haddock, cod, and shellfish. Cod, in particular, seemed inexhaustible. Early fishermen claimed they could drop a weighted basket in the ocean and bring it up full of cod. Now, the decimation inflicted by overfishing and use of dragnets has forced regulations that forbid most commercial fishing for cod in New England and Canadian waters. On the plus side, in recent years the Boston Harbor Project *(see Appendix E)* has helped make the Harbor a center for recreational activities; an effort aided by the efforts of Boston Harbor Now, formerly The Boston Harbor Association, an advocacy group which is working with the city and state to make the 43-mile HarborWalk (from the Neponset River to Constitution Beach, East Boston) a reality.

Note: Under the public trust doctrine, a legal principle that dates back nearly 2,000 years, the public has fundamental rights in natural resources such as the air, the sea, and the shore. The Colonial Ordinances, 1641–47, codified the public trust doctrine for Massachusetts. The Legislature through **Chapter 91**, and the State DEP by regulations, apply these principles to (a) historic tidelands (certain land created by filling in the tidal flats and marshes that surrounded the original Shawmut peninsula) and, (b) today's active waterfront. Through Chapter 91, the Commonwealth seeks to preserve public access to and along the shoreline, to promote water-dependent use of tidelands, and to guarantee that private uses of tidelands serve a proper public purpose.

ROWES WHARF Atlantic Avenue at High Street Skidmore, Owings & Merrill, 1987–88

In 1666, the **South Battery**, or the Sconce, was built at the foot of Fort Hill. It provided protection until the battery exploded during the great fire of 1760. In 1764, John Rowe, a patriot and merchant who donated the Sacred Cod that hangs in the State House, bought the land and built the first Rowe's Wharf, which extended a short distance into the Harbor. In 1765, Foster's Wharf was built on the site of the Battery. The first Rowe's Wharf was razed c.1962. A competition was held for the renewal of Rowe's

and Foster's wharves at the base of Broad Street in 1982. There were 5 acres available for a commercial, residential, retail, and maritime mixed-use project.

The present structure — made of brick, Deer Isle, ME granite and dense buff-colored concrete designed to emulate limestone — reflects the look of 19th-century Boston. Yet the complex, with its Chicago-style windows, is unmistakably modern. It now houses the Boston Harbor Hotel, offices, and condominiums. The BRA laid down many guidelines for its construction, notably: a 15-story, 165-foot height limitation; the preservation of various views; continuous public pedestrian frontage along the waterfront via a 30-foot easement; and public water shuttle facilities. The building is curved along Atlantic Avenue to follow the street pattern, while the waterside features 3 finger-like wharves extending into the Harbor.

Two 15-story towers anchor each side of the facade, and are linked by the most distinctive feature of the structure — a 60-foot double-arched entryway at the center of the building. Above the arch floats a copper dome, which crowns a rooftop lounge and observation deck. The dome rests on 4 intersecting arches (double arches with the secondary arches inside) that form an expansive vault.

The arch draws one into the complex; the way the heights of the portions of the building step back from the street to the water forges a visual link between the height of downtown Boston and the old piers of the waterfront. The smaller scale and traditional materials allow the building to fit into the site, and the city, very successfully. The area is a haven for pedestrians, and offers various modes of water transit including commuter ferries, and a water taxi to the Airport.

[Go left behind Rowes Wharf to enter Harbor Towers.]

HARBOR TOWERS 65–85 East India Row I.M. Pei & Partners (Henry Cobb), 1971

The Harbor Towers stand on the site previously occupied by Charles Bulfinch's India Wharf. Harbor Towers introduced a new form and scale to the waterfront. The two 396-foot-tall towers are of cast-in-place concrete, organized radially in a pinwheel fashion around a central core and offer dramatic views of Boston and its Harbor. Balconies, resembling zippers, line the edges of the towers providing a sculptural relief that emphasizes the verticality of the buildings and a sense of depth in contrast to the flat grid of the facade. Pei allegedly commented that the configuration is India Wharf vertically. This modern skyscraper has not been widely copied along the waterfront.

Between Harbor Towers stands a sculpture, *Untitled* by David von Schlegell (installed 1972). It is composed of 4 bent planes of stainless steel and buffed aluminum, each reflecting in various ways against the sun, clouds and shadows. The outlines suggest a ship's hull, a dry dock, or a series of spring sails.

India Wharf: Sponsored by developers Harrison Gray Otis, Francis Cabot Lowell and Uriah Cotting, Charles Bulfinch was responsible for the design and construction of a huge venture that included Broad Street, India Street and India Wharf. The India Wharf building (1807) was the largest Federal-style edifice in Boston: 75 feet wide, 425 feet long, 6 stories high with space for 32 marine-related businesses. The west end of the edifice was demolished in 1868 when Atlantic Avenue was built, and the east end disappeared in 1962 with the advent of Harbor Towers. A few small buildings along Broad Street are all that remain of this vast waterfront project. (There once was a plaque on the waterside Tower depicting India Wharf.)

China Trade: The name India Wharf alludes to the active trade with the Far East that Boston merchants developed after the Revolutionary War when England closed its ports to America. In 1787, Charles Bulfinch and his father were among 7 backers of the pioneering voyage of the *Columbia*, which sailed from Boston around South America to what is now Vancouver Island. There, items were traded with the Indians for sea otter pelts, which were transported to Canton, China to trade for tea, silk, and porcelain. The ship returned after 3 years, having covered 40,000 miles. This was the first time the Stars & Stripes circumnavigated the globe. During her second voyage in 1792, also backed by Dr. Thomas Bulfinch, the Columbia River in the Pacific Northwest was discovered and named. Captain Robert Gray dubbed the bay near its mouth 'Bulfinch Harbor' (now Gray's Bay).

NEW ENGLAND AQUARIUM 50 Atlantic Avenue Cambridge Seven, 1969
West Wing: Schwartz/Silver, 1998
Tank Restoration: Cambridge Seven, 2013

The Aquarium was the first major tourist attraction along the waterfront, and its presence is credited with playing an important role in the waterfront's redevelopment by offering a desirable destination. The classic brutalist form was a pioneering project for many future aquariums. The 4-story concrete box is famous for its floor-to-ceiling 200,000-gallon tank, surrounded by a spiral ramp and housing an assortment of marine life. At that time, the mission was to initiate the public into the wonders of underwater creatures via a dark, windowless edifice designed to transport visitors away from all that was familiar, eliminating exterior light that would have distracted from the aqueous displays inside.

The Aquarium's West Wing was part of a major expansion that aimed to support a new quest: creating an awareness of the interrelationship of the human world and the world of water. Unlike the initial building's sober box-like design, the West Wing is a complex array of angular structures that reach out to form a dramatic entry. It is made of a steel frame with steel stud infill and stainless steel cladding. Shimmering in the light like fish scales, the cladding consists of radially sanded steel panels. The design evokes maritime images such as a lobster, ship, fish or iceberg.

The West Wing features a cafe, gift shop, and large areas of glass curtainwall that allow glimpses inside, while providing cafe patrons with views of the Harbor. The building's skin, with its shingles reflecting sea and sky, connects the human world to the world of water — with views to the city on one side, and Harbor vistas on the other. Water-like elements abound inside. An ultramarine colored terrazzo tile floor and translucent fiberglass ceiling tiles echo the steel panels of the walls, but are smaller and lighter. They create a wave effect like the surface of the ocean seen from underneath. The unusual style has been called 'coastal architecture.' The resemblances to Frank Gehry's deconstruction Guggenheim Museum in Bilbao, Spain, and to his MIT Stata Center are apparent. In 2013, the Giant Ocean Tank was rebuilt, and the surrounding area was refurbished.

Matthew and Marcia Simons IMAX Theater E. Verner Johnson & Associates, 2000–01
The angular metal-clad theater offers large-format movies with 3D capabilities and a 400-seat auditorium.

LONG WHARF

Built c.1711 by Captain Oliver Noyes, Long Wharf was thought to be about 1,600 feet long. With a depth of 17 feet at its end, it permitted the direct loading and unloading of the largest vessels of the time without the use of boats or lighters (barges). Long Wharf was the queen of Boston's wharves, a grand entry to Boston from the sea. Following the path of State Street today, the promenade up Long Wharf met *terra firma* near 75 State Street (named King Street pre-Revolution) and ended at the Old State House. Long Wharf is reputedly the oldest continuously operating wharf in the country.

Gardiner Building/Chart House 60 Long Wharf Date unknown (According to its Historic Register Form, it may have been built in 2 sections, the eastern one in 1763; the western one in 1830.)
Anderson Notter: Renov., 1970s; Platt Anderson Freeman: Renov., 2000
Long thought to be the only surviving pre-Revolutionary War warehouse in Boston, similar structures would have lined Long Wharf in the 1700s.

Custom House Block 66–70 Long Wharf Isaiah Rogers, 1845–47; Renov.: Anderson Notter, 1970s

The ground level is constructed of massive posts and lintels of single stone chunks. A central block with pyramidal roof rises one story above the 4-story edifice, defining the central arched entrance. The brick rear facade is of utterly different character, with several gabled windows. The structure was originally topped with a cupola. Initially, the Custom House Block was rented to the Government for the use of Custom appraisers. For many years it housed the port's immigrant detention station, and then became a residential/office building. "Currently, it is being rebuilt to expose bricks and beams, with an eye on luring tech or creative tenants. The challenge, said the New York developer's David Rattner, is to convert a building built in vertical sections into one with the broad open spaces popular for industrial-style offices. That includes new windows and using loft space under a peaked roof. And the foundation will be improved to better cope with flooding." —Logan, *Boston Globe*, 2/7/2017

Famous Bostonians associated with Long Wharf include:

John Singleton Copley (1737–1815), the American portrait painter, was born on Long Wharf and lived with his widowed mother in a tiny house with a tobacco shop on the first floor.

Nathaniel Bowditch (1773–1838) was born in Salem. A self-taught mathematician, astronomer and sailor, he is best known as the author of The New American Practical Navigator (1802). It was informally known as 'the seaman's bible,' but most seamen just called it 'Bowditch.' Every seaman's gear included: "a quadrant, a chest of sea clothes, a Bible, a Bowditch, and a mother's blessing." The Navigator is still considered the standard, classic American treatise on navigation. From 1823–38, Bowditch served as the first executive officer of the Trustee Company of the Massachusetts Hospital Life Insurance Company, having a title of Actuary. The Company had its offices at what was then 50 State Street (originally Long Wharf). The Company was founded in part to assist the new Massachusetts General Hospital, and a third of the net profits were paid annually to MGH.

LONG WHARF PARK and **PAVILION** End of Long Wharf Sasaki & Assoc., 1989

The plan of Long Wharf Park incorporates traditional materials, nautical elements and a compass rose. The Compass Rose, the focus of the Park, is 60 inches in diameter. It uses the form and letters of a compass card designed by Samuel Thaxter, who worked out of the old Williams Shop at 1 Long Wharf in 1792. The Compass Rose is predominantly a white, red and black 18th-century graphic, and its inlaid bronze *fleur-de-lis* North points give magnetic directions.

Adjacent pavings of Deer Isle, ME granite depict true North bearings. The Rose shows the difference between true North and magnetic North, a deviation that still is important to navigators. True North is calculated mathematically—actual latitude and longitude. Magnetic north is the magnetic center of the earth and shifts periodically. Navigation charts are based on true North, but navigators use magnetic compasses, so they must know the deviation between true and magnetic North. The deviation depends on where one is on the earth. In Boston, it is approximately 17.2 degrees. The paving grid around the compass shows true North, South, East and West, while the compass itself shows magnetic North.

The pavilion at the end of Long Wharf on the north side, constructed in 1990, is a vent for the subway — the MBTA Blue Line — which goes under the Harbor to Logan Airport. In 1997, Boston's Harbor Islands became the Boston Harbor Islands National Recreation Area — 1,200 acres of land on 34 islands and peninsulas. Ferryboats to some of the Harbor Islands depart from Long Wharf.

From the end of Long Wharf, the waterside end of Commercial Wharf with its name incised in the pediment is visible. One can also see a collection of excursion vessels, whale watching boats, and cruise/party boats. From here one also has a nice view of Boston's inner Harbor, which would have been much more open in earlier days.

In-filling of the South Boston mudflats and construction of the Airport have blocked the expanse of horizon that was part of the 19th-century vista. The great piers visible to the right were built on shallow marshy areas that were filled starting in 1836.

[When returning from Long Wharf Park, before cutting through the Marriott Long Wharf, there is a good opportunity to discuss the Custom House.]

View of:
CUSTOM HOUSE State and India Streets Ammi B. Young (Base), 1837–47
Peabody & Stearns (Tower), 1913–15

Goods and merchandise that entered the port of Boston were subject to tax. Over the years, several different buildings housed Custom officials, whose job it was to collect duties on imports. In 1837, Ammi B. Young designed a Quincy granite Greek Revival Custom House featuring four temple fronts. A central rotunda and skylight dome (still intact but covered by the tower) thrust up from the original roof. The Custom House was built on land filled by the Broad Street Associates. To support it, workers drove 3,000 wooden pilings into the unstable fill — an arduous task that took three years to complete. At one time the water lapped up to the steps, and the bows of incoming ships poked close to the windows. Now, due to the infilling of Long Wharf into State Street over the years, the Custom House is several blocks from the waterfront.

In 1913 demands for new space — and a limited budget that could not support purchase of additional land — led the federal government to add a 495-foot Renaissance tower to Young's Custom House. Peabody & Stearns designed the Cape Ann granite-clad steel frame tower. Claiming federal immunity, the government ignored the Financial District's 125-foot height limit and erected what would be the city's tallest building until 1965 when the Prudential Tower was built. The Custom House Tower, with its great 22-foot wide clock has become one of Boston's signature landmarks.

The federal government declared the building surplus in 1986 and sold it to the city for $11 million. Many proposals for its use were put forward but none were viable. In 1996, the Marriott Corporation took a 60-year lease on the building and developed it for interval ownership — the first urban timeshare.

Note: The Custom House Tower was often the last view of Boston for troops being deployed during World War II.

MARRIOTT LONG WHARF 296 State Street Cossutta & Associates, 1980–82

One of the first hotels on the downtown waterfront, its form mimics the cut and thrust of the original wharf, and the brick massing relates loosely to the early warehouses. The end facing the Harbor resembles the prow of a ship. The hotel rests on 500 prestressed, precast concrete piles, 14 inches square with an average length of 90 feet that rest on bedrock. The bolted steel frame is designed to withstand earthquakes. The stepped form rises from 49 to 104 feet and is set back on the south and east sides to

open views to the Chart House from Atlantic Avenue and the Park. The lower floors contain function rooms and a garage. On the main floor, three 5-story spaces serve as lobbies, lounges and function areas. Pedestrians may cut through the hotel on the ground level.

CHRISTOPHER COLUMBUS PARK Off Atlantic Avenue Sasaki & Associates, 1976
Renov.: Ken Crasco, City of Boston's Landscape Architect; Halverson Co., 2002–03

This area was the site of an appendage of Long Wharf called T Wharf, built in the 1720s, which jutted out into the Harbor here. It was attached to Long Wharf by remains of the 1673 defensive barricado, forming a 'T.' (The Barricado was a seawall built across the mouth of Town Cove, with openings in it to allow the passage of vessels.) Over the years T Wharf was gradually extended out into the Harbor, parallel to Long Wharf. By the time the packet piers were built in the 1830s, T Wharf extended into the Harbor as far as Long Wharf did. T Wharf was the center of trade with Nova Scotia and the West Indies, and was one of the last active wharves on the waterfront in the early 20th century. As larger cargo vessels came into service after the Civil War, older wharves were abandoned for bigger ones with better rail connections in East Boston, South Boston and Charlestown. Nearly all that remained was the fishing fleet, which called T Wharf home for over 30 years.

In 1882, the T Wharf Fish Market Association (wholesale fish dealers) built a long row of wooden stores the entire length of the wharf. On market days boats of all shapes and sizes crowded up to T Wharf, 3–4 deep. On 17 March 1909, sixty-one fishing vessels put into T Wharf, making it possible to walk from Long Wharf to T Wharf to Commercial Wharf on the decks, without touching land or water. The native Yankee fisherman gave way in the 1850s to immigrants, who brought new ideas to the fishing industry. In the late 19th century, visitors to T Wharf remarked on the powerful fish odor, the maze of masts arising from the crowded fleet of small fishing vessels, and the swarthy seamen hauling on ropes or drawing carts filled with fish and crustaceans. In 1912, Italian fishermen introduced Boston to eating albacore (tuna). Most of the fish dealers relocated to the new Fish Pier on the South Boston flats in 1914. Without occupants and regular maintenance, the wooden block sagged and the wharf crumbled until it was demolished in the 1960s.

Built in 1976 and initially called Waterfront Park, Christopher Columbus Park was part of an overall renewal of the area that began in the 1960s and included rehabilitation of many old granite warehouses. The 5-acre park's centerpiece is a 25-foot-high vaulted trellis, which acts as a connector to various locations in the Park and separates the open area and several outdoor 'rooms' including a rose garden and fountain. The children's play area follows a nautical theme. 'Ship's lanterns' illuminate the promenade, and chains connect the bollards along the seawall. The 2003 renovation added new walkway paving, a maintenance building, and The United Way Children's Plaza — a fountain by day and a stage for concerts and theater productions at night.

Initially, Sasaki designed the park to provide a window to the Harbor and serve as terminus to Boston's Walk to the Sea. Placing the Park directly on the waterfront required realignment of Atlantic Avenue. Sasaki needed to raise the ground level because trees planted at wharf level would have died from the high salt content of the soil, and the site was underlain with utilities.

Note: The Massachusetts Beirut Memorial (Schreiber Associates Landscape Architects, 1992) honors nine Massachusetts Marines who were killed in a 1983 bombing. The memorial includes a circular granite-seating wall and brick detailing; if you stand in its center you can hear your echo. It is located near the Commercial Wharf end of the Park.

[Optional, as the view of Mercantile Wharf from Columbus Park may be obscured by foliage.]

MERCANTILE WHARF Commercial Street Gridley J.F. Bryant, 1856–57
Renovation: John Sharratt Associates, 1976

Building up momentum through the work of the Broad Street Associates and the construction of Quincy Market, Boston entered its 'granite period,' a golden age for the port that lasted from 1830–60. Commercial Street follows the line of what became a busy 19th-century shoreline. Mercantile Wharf is one of the great granite warehouses built during this era and remains one of the least altered of the surviving wharf buildings of this type. The 5-story rectangular block is Quincy granite with a steep gable roof and little ornament. It is designed in the Italianate style — string courses run beneath the windows of each floor and a bracketed cornice defines the top. Rusticated verticals separate each bay and the ground floor has the traditional arched openings. Contrary to type, Mercantile Wharf building ran perpendicular to the three piers it served. Usually, wharf buildings ran parallel to the piers. Mercantile Wharf initially housed riggers (manufacturers of the ropes/chains needed to support and work a ship's sails & masts), and ships' chandlers (dealers in supplies and provisions for long sea voyages). Sometimes the gable roof was used as a sail loft to make sails.

[Continue down Atlantic Avenue.]

COMMERCIAL WHARF from Atlantic Avenue Isaiah Rogers, 1832–34
East section renovation: Halasz & Halasz, 1968–69
West section renovation: Anderson, Notter, Feingold, 1971

In 1832, Isaiah Rogers undertook constructing one of Boston's earliest granite warehouses. As there were few prototypes, Rogers was unsure how the expensive granite would hold up in the sea air. As a result, the rectangular Commercial Wharf is two-faced: Quincy granite to the south and Charlestown brick to the north. The end facing Commercial Street, which was once its public face where the land met the sea, has a classical entrance topped by an inset clock. The use of granite continued until after the Great Fire of 1872 when it was discovered that under intense heat the stone had a tendency to blister and crumble.

Commercial (or Granite) Wharf was the *grande dame* of Boston wharves, housing merchants dealing in foreign trade to the East Indies, South America and Europe. As Colonel Forbes remarked: "It was a high-toned wharf in those days and if a fishing smack or a lobster boat stuck its nose into the dock, it would have been fired out instanter." —W.H. Bunting, p.44

The growth of the textile industry in the 1830–40s encouraged trade with Southern cotton and South American wool ports. The shoe trade fostered traffic in hides from the U.S. Pacific coast and South America. Frederic Tudor's idea of shipping ice to southern ports was laughable to many Bostonians in 1806, but by the mid-1830s most New England villages with access to tidewater began to cut ice from their ponds and ship it out in the expectation of a sizable profit.

Among those who set sail from Boston Harbor, possibly from Commercial Wharf, was **Richard Henry Dana, Jr.** (1815–1882). Born into a prominent Cambridge family, he contracted measles during his junior year at Harvard, which affected his eyesight. He left college, determined to go to sea. He was only 19 years old when he boarded the *Pilgrim*, a 180-foot brig that sailed from Boston Harbor in 1834. Thus began his voyage to California, an experience he later chronicled in Two Years Before The Mast (1840). Like Dana, sailors of the early to mid-1800s were young by today's standards. Captains were often in their 20s; a seaman over age 30 was rare. The vessels were small and the standards of seamanship were high. Dana described the look of the sailors roaming Boston's 19th-century waterfront:

> "A sailor has a peculiar cut to his clothes, and a way of wearing them which a green hand can never get. The trousers, tight round the hips, and thence hanging long and loose round the feet, a superabundance of checked shirt, a low-crowned, well-varnished black hat, worn on the back of the head, with half a fathom of black ribbon hanging over the left eye, and a slip-tie to the black silk neckerchief..." —Dana, p.1

[Between Commercial Wharf and Lewis Wharf on Atlantic Avenue.]

Boston Yacht Haven 87 Commercial Wharf Carr, Lynch & Sandell, 1999

This 100-slip marina features a Raddison Wave Attenuating Floating Dock System, accommodations for vessels up to 300 feet, in slip fueling, locker rooms with showers, and deluxe guest suites.

The **AIRPORT Control Tower** in East Boston is visible from here. In 1923, in-filling and construction began for Boston, now Logan Airport, and the former Apple, Bird, Noddles, and Governor's Islands became part of the mainland. "The Airport is a city within a city on a 1,700-acre footprint of land."
—http://www.massport.com/media/2396/massport-fact-sheet.pdf

LEWIS WHARF 28–32 Atlantic Avenue Richard Bond, 1836–40
Renov.: Carl Koch & Assoc., 1965–69; 1971

In the mid-1600s Thomas Clark built a pier which, until the construction of Long Wharf, was Boston's largest and busiest wharf. In 1761, it became the property of Thomas Hancock and was inherited by his nephew, John Hancock. On 28 April 1780, Lafayette, aboard the wartime frigate *Hermione,* landed here. The pier known initially as 'Lewis's Wharf' was built next to Hancock's Wharf in 1796. Today's Lewis Wharf was built on what was the old Lewis and Hancock Wharves. The present Quincy granite wharf building was constructed in 1836 by a coalition of Boston businessmen. It was built to last with 16-inch granite walls and soaring pine beams, and now houses condominiums.

But it once housed the offices of the Williams & Glidden California Clipper Line. From 1845–55, the 'Golden Age of Sail,' the seas were ruled by the Yankee clipper ships, the fastest vessels and largest merchantmen the world had ever seen. Although most clipper ships sailed in and out of New York City, many were built in Boston. One of the best builders of these famous ships was **Donald McKay** (1810–1880), whose shipyard was across the Harbor in East Boston. His most renowned ship was the *Flying Cloud* (1851), which made the trip from New York to San Francisco in just 89 days. The clipper design sacrificed ⅓ of standard cargo space to gain speed. The impetus was the rapidly growing market in California, spurred by the Gold Rush of 1848. They were very expensive to construct. Unfortunately in the heat of the moment, more clippers were built than the market could bear, and owners bet and lost heavily on their ships in races 'round the Cape.' As a result, the clipper era faded in the 1850s, after only 10 years of trade.

Note: Cape Horn, the southernmost point of South America, was an unavoidable part of the route as the Panama Canal wasn't completed until 1914.

> "Never, in these United States, has the brain of man conceived, or the hand of man fashioned, so perfect a thing as the clipper ship. In her, the long-suppressed artistic impulse of a practical, hard-worked race burst into flower. … but they were monuments carved from snow. For a brief moment of time they flashed their splendor around the world, then disappeared with the sudden completeness of the wild pigeon. One by one they sailed out of Boston, to return no more." —Morison, p.370

Like the clippers, the importance of the Port of Boston proved short-lived. Unlike New York's Hudson River, the Charles River offered no useful route for commercial transport. Local merchants grossly underestimated the impact of the railroads and made no provisions to move goods inland. The 1868 construction of Atlantic Avenue was an attempt to improve access to Boston's piers and wharves. Starting just north of Lewis Wharf, it cut a swath through the waterfront area and forever changed its dynamics. It bisected **Commercial Wharf**, leaving half of the building the west of the new roadway, as can be seen clearly and dramatically from here. Central and India Wharves were also halved.

In 1872, tracks for the Union Freight Railroad were laid on Atlantic Avenue and Commercial Street to provide a connection between the railroad terminals near today's South Station and today's North Station.

After the Boston Elevated train opened in 1901, its tracks formed a canopy over the Union Freight RR. The El was discontinued in 1938. The Railroad continued to operate until its closing in 1970.

Note: Lewis Wharf is the home of the Boston Sailing Center, founded in 1977, with unique facilities on a Louisiana Riverboat.

PILOT HOUSE c.1845; Renov.: Carl Koch, 1971; Renovated & extended, 1997–98

In 1843, the Eastern Railroad built a wharf nearby to accommodate its Boston station, as well as ferry passengers from East Boston. This small brick structure was also constructed by the Railroad as a hotel for the travelers. It served a variety of commercial and industrial uses until it was converted to offices in 1972. It is currently commercial space.

TWO ATLANTIC AVENUE Finegold Alexander & Associates, Inc., 1997–98

This 6-story complex was built as a 70,000 SF addition and an underground garage to the Pilot House, which was renovated at the time. The grounds consist of a promenade that connects to the HarborWalk.

Note: The Pilot House Waterfront History Interactive Exhibit at 2 Atlantic Avenue inside the Bank of America ATM, is open to the public Monday–Friday, 8 a.m.–5:30 p.m.

[If time permits, follow the HarborWalk around the Pilot House and along the boardwalk parallel to Union Wharf to return to Commercial Street. Otherwise, just go directly up Commercial Street.]

Optional: If you wish, use this point or vicinity to discuss the **Boston Floating Hospital**.

"**Floating Hospital's** history as a pioneer in pediatric care began with the Reverend Rufus B. Tobey, a kindly Congregational minister who was struck by the sight of indigent women and their sick children enjoying cool ocean breezes on Boston's waterfront on sweltering summer evenings. Healthcare at the time had few means of therapy and fewer cures, but many believed in the cleansing and therapeutic qualities of sea air to ward off poor health and specific diseases.

To help families, Tobey proposed taking sick babies and their mothers for a day's outing on Boston Harbor. The *Boston Herald* reported Tobey's suggestion and the story brought in a flood of donations to help make it a reality. On 25 July 1894, the Boston Floating Hospital was born on a rented boat, *Clifford*. (Initially, the barge *Clifford* was used for romantic evening cruises.) Each day, babies received needed therapy, mothers learned how to care for and feed their children safely, and patients, parents, doctors, nurses, volunteers and crew enjoyed the 'beneficial harbor breezes.' For 33 years the hospital offered medical care for sick children while cruising Boston Harbor.

Teaching and Innovative Research Begin

The Floating Hospital quickly responded to the growing need to train medical and pediatric nursing students. A 170-foot ship was built at the Atlantic Works Wharf in (East) Boston in 1906, enabling the creation of a larger inpatient hospital, as well as an intensive onboard training and research institute for pediatrics.

Floating Hospital established a reputation for making substantial contributions to the knowledge of childhood diseases. Prior to the development of milk pasteurization in 1921, many children suffered from gastroenteritis, popularly known as 'summer diarrhea,' caused by milk that had spoiled in the summer heat. Noted milk chemist Dr. Alfred Bosworth, who maintained that human milk was superior to whole cow's milk for feeding infants, tirelessly researched formulas in his laboratory on the ship in the summer. He developed the formula known today as *Similac*®, which has since nourished millions of infants worldwide. Meanwhile, Dr. Francis Denny pioneered the human 'milk bank' at Floating Hospital, supplying stored human breast milk with which to feed sick infants.

Onshore Operations Broaden

In the 1920s, Floating Hospital created an onshore facility for research and some clinical specialties. It also began its affiliations with Tufts University School of Medicine and Tufts Medical Center's predecessor, the Boston Dispensary, which was founded in 1796.

The Floating Hospital ship was destroyed by fire in the spring of 1927; fortunately, no patients were aboard. Rather than rebuild the ship, the trustees decided to expand the onshore program. In 1931, the Jackson Memorial Building opened at the hospital's current site (755 Washington Street), and Floating Hospital became a year-round facility with ongoing research activities."

— floatinghospital.org/AboutUs/FloatingGlance/History

Note: The above history simply states that the Floating Hospital cruised the Harbor, but didn't say if there was a specific spot where it was berthed, and if so, whether that changed over time. A 1908 postcard shows the Floating Hospital "at her pier at North End Park, as seen from Copp's Hill." Further research indicates the inaugural launch left from Snow's Wharf (south of Foster's Wharf at the end of Oliver Street). The south side of Commercial Wharf was also mentioned as another berth.

UNION WHARF 323 Commercial Street c.1830s; Renov.: Moritz Bergmeyer, 1979

"The sober dignity of Boston's granite warehouses is nowhere better expressed than in Union Wharf. Its rough granite is utterly straightforward and without artifice." —(AIA) It was originally uniformly 4 stories tall, until a 5th floor as added in the late 19th century. The rear section was reduced to 3 stories after a fire in the 1940s. It was first used as a bonded warehouse by the U.S. government, and was later sold to the Metropolitan Steamship Company, which operated steamers between Boston and Maine. It was sold for residential redevelopment in 1977. It is now composed of two granite buildings and 23 townhouses; the townhouses were part of the 1979 renovation.

LINCOLN WHARF 357 Commercial Street 1901; Renov.: The Architectural Team, 1987

This former MBTA power plant has been converted to housing, purportedly the first renovation of a major electrical power plant for residential use. It is almost two separate buildings. The original part is the rear portion that has remnants of "Lincoln Power Station 1901" visible between the added windows. The front portion, with the arched windows is a 1907 addition. One can see the difference between the two sections clearly in a side view, since the height and roofline change at that point. "Conversion of the windowless 150-foot cube-shaped brick envelope required extensive interior demolition of existing steel structure, coal bins, and electrical generation equipment. The design required the insertion of 13 new floors within the brick shell on 12,000 existing wooden piles. The floor plan was organized around a new atrium to provide light, air, and views to internally oriented apartments, and to create a striking sky-lit interior courtyard." —http://www.architecturalteam.com/projects/lincoln-wharf/

BURROUGHS WHARF 40–50 Battery Street Notter, Finegold, Alexander, 1986

Burroughs Wharf is built on the site of the once derelict Lincoln Wharf 'Coal Pocket,' (a structure for coal storage). The two-building condominium complex also includes a fountain encircled by landscaped gardens, a promenade, a public landing area, marina slips, and a water taxi stop.

In addition to residences, Burroughs Wharf houses the Boston Fire Department's Marine Unit, docked at 50 Battery Street since 1991. Marine Unit 1 is the *John S. Damrell*.

BATTERY WHARF 377 Commercial Street The Architectural Team, 2005–07

In 1646, it was a shoreline gun battery off Merry's Point, securing the mouth of the Charles River, and protecting Boston from an attack via the sea. It was known as North Battery after a South Battery was constructed near Rowes Wharf in 1666. It was rebuilt of stone in 1744. After the Revolutionary War, it

was deemed no longer needed. It was known as Jeffrey's Wharf from 1789–c.1800. North Battery and its connecting wharf were sold as Battery Wharf, "named for its ancient purpose" in 1803. One of its owners was Joseph Warren Revere, a son of Paul Revere, who purchased it in 1831.

The Wharf changed in size and shape over the years. J.W. Revere rebuilt it in 1855, after it was destroyed by fire. It was rebuilt again in 1892–93, and many of the old pilings were donated to the indigent for firewood. In 2000, all the wooden pilings were replaced by concrete ones during the hotel construction.

The Wharf and its surrounding area was a center for shipbuilding, marine shipping and warehousing. The Wharf's ferry to East Boston* (known as the North Ferry, as opposed to the South Ferry near Lewis Wharf) began in 1853. Battery Wharf was also a stop on the Union Freight Railroad and the Boston El. From the end of the 1800s until just before the Great Depression of the 1930s, the area accommodated three major Boston entities: Lowney Candy Company (later bought by Hershey), Quincy Market Cold Storage, and the Lincoln Power Station.

Several wartime events took place at this Wharf: On 18 April 1775, Paul Revere was rowed from a spot near North Battery to Charlestown, where he began his famous midnight ride. During the Battle of Bunker Hill on 17 June 1775, many of the British soldiers were deployed from the wharf at North Battery to Charlestown. On 28 May 1863, the sendoff parade for the Massachusetts 54th Regiment made its final stop at Battery Wharf, where the men were transferred to a steamship en route to the South.

During the last half of the 20th century, the Wharf was home to the Coast Guard station, and the Boston fire boat dock at Burroughs Wharf. Bay State Lobster Company was here from the 1960s–1990s. Now it hosts the **Fairmont Battery Wharf**, a luxury hotel and residential complex that opened December 2008. Note the tree planters, which are shaped like boats, or sport wave motifs.

The complex also contains a 'pocket museum'— the Maritime Museum at Battery Wharf, which was launched in 2009, and combines the various aspects of the Wharf's 350+-year history. Its floor is fashioned from the old Wharf's oak pilings. Among the exhibits is a large live-oak timber preserved at the Charlestown Navy Yard for use in repairing frigates like *U.S.S. Constitution*, which was built in Edmund Hartt's shipyard near Battery Wharf in 1797. (She is berthed at Charlestown Navy Yard.)

CONCLUSION: For most of the 20th century, the Harbor and Waterfront had been of little use or importance to Bostonians, but that has changed. The renovations which began in the 1970s, and continued though the 1980s and beyond, brought people back to the Waterfront. Though imports and exports are moving out of Logan Airport and piers in South Boston, East Boston and Charlestown, Boston Proper's Waterfront is now a vibrant mix of hotels, restaurants, residences, & recreational spaces.

*In 1870, the City of Boston took over both the North and South ferries. They took 20 minutes to cross the Harbor, and were called "Penny Ferries" because people insisted that they should be free (or almost free), like bridges and highways.

PR: Boston has a great seafaring heritage. Ocean trade and its related industries had a major impact on the growth of Boston and the shape and character of its waterfront. This tour includes the beginnings of Long Wharf as the grand entry into Boston, and the genesis of its Financial District, and the lore of clipper ships and the China Trade. Also featured are some classic Boston Granite wharf buildings such as Commercial Wharf, Lewis Wharf and Union Wharf. Take in the spectacular views of Boston Harbor as we wind our way among the wharves old and new, from Rowes Wharf to Battery Wharf in the North End

APPENDIX A • RELATED SITES and INFORMATION

ATLANTIC WHARF Congress Street and Atlantic Avenue CBT, 2011

The mixed-use development contains 31 floors of office space, 86 residential units, ground-level retail and public spaces, six stories of below-grade parking, and a waterfront plaza. The complex sits on a platform of restored and renovated historic structures. From c.1898 to 2007, the site contained 3 low-rise mercantile buildings eventually called the Russia, Graphic Arts and Tufts Buildings. The preservation of the historic 1897 Peabody & Stearns Russia Building and the existing facades of the other wharf buildings were an essential component to the project. The office tower was constructed on the site of the Graphic Arts and Tufts Buildings. These two buildings were built in 1897 by Rand and Taylor, Kendall and Stevens. The Graphic Arts Building was a center for printing and publishing; one long-term occupant was American Type Founders. The Tufts Building was named for James W. Tufts, whose Arctic Soda Fountain business manufactured, displayed and shipped its products here. The Russia Building was initially known as the Library Bureau Building after its first major tenant.

"The office tower's taut glass curtainwall introduces a contemporary aesthetic and the exterior wall projects at an angle beyond the bold structural frame to create a sail-like form. The 31-story tower emerges from the ground level and a soaring 8-story glass-enclosed atrium creates the grand tower entry." cbtarchitects.com It is certified LEED Gold.

A 1796 map sited this as Russell's Wharf, which was then owned by Thomas Russell. By 1807, maps noted it as **Russia Wharf**. William Underwood, Father of the American Canning Industry, established his business here in 1821. This wharf was the major center of Boston's Baltic trade in the 1800s. From 1790–1850, vessels left New England with sugar, rum and molasses, and returned with candles, goose quills and shipbuilding supplies like resin, iron, canvas, and, most importantly, hemp for making rope.

INTERCONTINENTAL HOTEL 500 Atlantic Avenue Elkus|Manfredi, 2006–07

The first private development completed on a Big Dig parcel is the InterContinental Hotel and Condominiums. The InterContinental parcel is another major piece of tunnel infrastructure — a vent building, in this case Vent Building #3. This edifice completely surrounds and hides the ventilation structure, except for some evidence of air-intake vents on the side. The building houses a luxury hotel and condominiums. The design is intended to reflect the sky and water, and to convey the idea of a ship at sea. A subtle nautical theme continues in the lobby, with river stones on the floor and dark wood meant to be reminiscent of a yacht. "Inspired by the tall ships that once lined the wharves of the Boston waterfront, the winds that once filled the magnificent sails are remembered in the ever-changing reflections of the sky moving across glass facades, the window grids reminiscent of the rigging and curved podium evocative of Boston's maritime trade." —Howard Elkus

INDEPENDENCE WHARF 470 Atlantic Avenue Renov: Bergmeyer Assoc., 2001

This office building was renovated by Modern Continental, one of the major contractors of the Big Dig, and dubbed Independence Wharf. During the renovation, Modern Continental added floors that caused the building to exceed its permitted height. As a result, the developers agreed to open the top level to the public as an observation deck, which provides a view of Fort Point Channel and the Harbor. The deck is purportedly open daily from 10 to 5.

Note: The expansion of Boston's waterfront has obscured the stretch of Griffin's Wharf into the Harbor. The actual location of Griffin's Wharf remains unsettled. (According to Nancy Seasholes, Griffin's Wharf was on the site of what is now the InterContinental Hotel.) Griffin's Wharf was where colonists dumped unwanted tea into the water during the Boston Tea Party on 16 December 1773. A plaque on the building states: "No! Ne'er was mingled such a draught in Palace, Hall or Arbor, As Freemen brewed and Tyrants quaffed That night in Boston Harbor."

[From the side walkway, one can view the Tea Party plaque, and mention the Fort Point Channel.]

Fort Point Channel is a maritime waterway separating South Boston from downtown Boston, feeding into Boston Harbor. The southern part of it has been gradually filled in; altogether ~1,000 acres were filled. These fill projects have resulted in the way the Fort Point Channel looks today. It is about a mile long, and is currently crossed by 7 bridges. In the 19th century, it became an industrial center, warehousing wool from around New England. Today, it is a 55-acre landmark district, known as an artists' colony, complete with lofts, studios, galleries and museums.

Note: Fort Point Channel is named after Fort Hill. Part of the hill jutted out into the Harbor, hence Fort "Point." The hill was an excellent defense location, and cannon were mounted atop it in the 1600s. Fort Hill (located at the intersection of today's Oliver & High Streets) was cut down in the mid-1800s and used for landfill. Neither the fort nor the hill nor the point exist any longer.

Captain John Foster Williams Coast Guard Building 408 Atlantic Ave. James A. Wetmore, 1918

"Captain John Foster Williams (1743–1814) A native Bostonian, John Foster Williams was an extraordinary man who courageously served his country. He went to sea at the age of 15 and by the age of 22, was commanding merchant vessels. During the Revolutionary War he commanded several vessels including the Massachusetts Navy 14-gun brig *Hazard*, which was captured by the British as a prize of war. Sent to England onboard a prison ship, he later escaped and returned to American to continue to fight. Selected by President George Washington, John Foster Williams commanded the first revenue cutter,* the *Massachusetts* in 1791 as part of the service which came to be known as the Revenue Marine, a predecessor of today's **U.S. Coast Guard**." (From a plaque on the federal building that houses the First Coast Guard District, and is named in his honor.)

*A Revenue Cutter sailed the waters of the East Coast making certain that inbound cargoes were not offloaded in locations other than approved Ports of Entry, thus ensuring that import tariffs were collected.

"The **U.S. Coast Guard** is simultaneously and at all times a military force and federal law enforcement agency dedicated to safety, security, and stewardship missions. We save lives. We protect the environment. We defend the homeland. We enforce Federal laws on the high seas, the nation's coastal waters and its inland waterways. We are unique in the Nation and the world.

Our official history began on 4 August 1790 when the first Congress authorized the construction of 10 vessels to enforce federal tariff and trade laws and to prevent smuggling. Known variously through the 19th and early 20th centuries as the 'revenue cutters,' the 'system of cutters,' the Revenue Marine, and finally the Revenue Cutter Service, we expanded in size and responsibilities as the nation grew.

The service received its present name in 1915 under an act of Congress that merged the Revenue Cutter Service with the Life-Saving Service, thereby providing the nation with a single maritime service dedicated to saving life at sea and enforcing the nation's maritime laws. The Coast Guard began to maintain the country's aids to maritime navigation, including operating the nation's lighthouses, when President Franklin Roosevelt ordered the transfer of the Lighthouse Service to the Coast Guard in 1939. In 1946, Congress permanently transferred the Commerce Department's Bureau of Marine Inspection and Navigation to the Coast Guard, thereby placing merchant marine licensing and merchant vessel safety under our purview.

The Coast Guard is one of the oldest organizations of the federal government and until Congress established the Navy Department in 1798, we served as the nation's only armed force afloat. We protected the nation throughout our long history and served proudly in every one of the nation's conflicts. Our national defense responsibilities remain one of our most important functions even today. In times of peace, we operate as part of the Department of Homeland Security, serving as the nation's front-line agency for enforcing the nation's laws at sea, protecting the marine environment and the nation's vast coastline and ports, and saving life. In times of war, or at the direction of the President, we serve under the Navy Department." — www.uscg.mil/history

Commercial Block 126–144 Commercial Street Gridley J.F. Bryant, 1856; Renov: Mintz Associates, 1978
Italianate style similar to Mercantile Wharf. A bracketed cornice tops a granite facade organized horizontally by string courses, and rusticated verticals that strengthen the corners.

State Street: Nautical motifs abound on the building facades: waves, anchors, dolphins, Neptune, and prows of ships. Note especially:

Cunard Building	126 State Street	Peabody & Stearns	1901
Farlow Building	92 State Street	Willard T. Sears	1891
India Building	84 State Street	Peabody & Stearns	1904
Board of Trade	131 State Street	Winslow & Bigelow	1901–03

State Street Block 177–199 State Street Gridley J.F. Bryant, 1858

One of the old granite warehouses, the rusticated upper floors contrast with the smooth granite string courses between floors, and segmental arches with keystones over the windows. The central pavilion features the name of the building, and a massive broken segmental pediment framing a granite globe and semi-circular window. The mansard roof is a later addition. Originally the building was longer, extending to the waterfront, but was shortened with the construction of the Southeast Expressway in the 1950s.

255 State Street: This was built in 1917 as an 8-story warehouse that was part of the 'granite block' on State Street, on the path between Central Wharf and the Custom House. Initially, it was connected to buildings on the other side of the Central Artery and was severed when the highway was constructed. In 1998, Schwartz/Silver refurbished the limestone facade and renovated the 11 floors of commercial space.

Central Wharf Warehouses 146–176 Milk Street *Attributed to* Charles Bulfinch, 1816

The original Central Wharf buildings were a row of 4-story brick structures 1,300 feet long stretching from Milk Street into the Harbor. (The Aquarium now marks the end of Central Wharf.) Of the 54 brick bays of the original, these 8 survive in various altered states. The hipped roofs and tall chimneys are typical of Bulfinch's Federal style warehouses. Most of the warehouses here were demolished for the construction of Atlantic Avenue.

Dock: A protected water area in which vessels are moored between two landing piers or wharves. The term is often used incorrectly to denote a pier or a wharf. The dock is the water adjacent to a pier or wharf.

Jetty: A pier, wharf or other structure, usually masonry, projecting out from the shore to influence the current or tide; a jetty may protect a harbor entrance or shoreline.

Quay: (kē, kā) A wharf or reinforced, paved embankment for loading and unloading vessels.

Pier: A loading platform extending at an angle from the shore. A structure built out into the water, usually with its greatest dimension at right angles to the shore, forming a landing place or a place alongside which vessels can lie.

Wharf: A man-made structure built along or at an angle from the shore of navigable waters so that vessels may lie close alongside to receive and discharge cargo or passengers, or be berthed there.

APPENDIX B • Selected Waterfront/Maritime Definitions

Boston Light: Erected in 1716 at the Harbor entrance on Little Brewster Island, Boston Light was the first lighthouse in the new world. It is the country's oldest continuously used lighthouse site.

The Broad Street Association: Fearing that facility limitations in Boston were leading to a business decline in the early 1800s, Federalist leaders and entrepreneurs organized the Broad Street Association to build harbor and waterfront improvements. "The leading spirit of this group was Uriah Cotting, a man of tremendous imagination and energy, to whom Nathaniel Ingersoll Bowditch, with cause, accorded the title of 'Chief Benefactor of Boston.' " (Whitehill, p.85) The Association's members included Harrison Gray Otis, Francis C. Lowell and Rufus Amory. Following Boston's tradition of expansion via landfill, the Association filled in the shoreline south of Long Wharf to create India and Central Wharves. The Association leased the land for warehouses, which were built according to strict design standards laid out by Charles Bulfinch and detailed in each lease agreement. The Association also built Boston's first Federal Custom House. With Bulfinch as planner, Cotting and his associates utterly transformed the face of Boston's waterfront. Several Broad Street buildings from 1805–10 remain standing today, including #63–73, #64, #72 and #102, as well as 146–176 Milk Street, c.1819. Following Bulfinch's model, they feature flared window lintels, hipped roofs, diminishing fenestration, dentil cornices, and string courses of the Federal style. "The growth of Boston's early 19th-century maritime trade led to series of speculative building projects along the waterfront. In 1805, Charles Bulfinch created a plan for the Broad Street Association, which unified the row of stores and warehouses at 5, 7–9, 64, 68–70, 72 and 102 Broad Street. This row replaced the decrepit wharves in the Custom House area and was one of several civic improvements Bulfinch undertook." —Bostonian Society plaque on 102 Broad Street. There is a similar plaque on 25–27 India Street.

Cod: Considered groundfish since they live in the ocean's bottom layers, they range from Cape Hatteras, to Maine, to the Hudson Strait, off western Greenland. Newfoundland—particularly off the Grand Banks—and Labrador have typically been home to the greatest abundance of cod. The heavy bodied, firm-fleshed cod was unsurpassed for salting and drying. "By the 18th century,

cod had lifted New England from a distant colony of starving settlers to an international commercial power." —Kurlansky, p.78 "Puritan Massachusetts derived her ideals from a sacred book, her wealth and power from the sacred cod." —Morison, p.14 Cod created the 'codfish aristocracy' of New England and was so important to maritime trade that John Adams made fishing rights off the Grand Banks part of the Treaty of Paris in 1783.

Impressment: The legal act of the forcible recruitment of men to work the ships of the Royal Navy. There were three main rules to honor: 1) There were exceptions to the threat of impressments: farmers, gentlemen, apprentices, ships officers and skilled craftsmen. That left the working poor generally living in urban port centers. 2) If men weren't pressed from ports, only men from inbound ships could be taken. Taking men from outgoing ships would put merchant vessels (and trade) at risk. 3) The Admiralty had to give sea captains permission and the civilian authorities had to agree. In the colonies, royal governors had to agree to the impressment of their citizens, but often this was ignored and ships' captains pressed without permission. Boston, like many of the colonies, would protest; the town's Impressment Riot occurred on 17 November 1747. However, the practice would not be declared illegal in the colonies until 1775.

Jack Tar: Seamen were often called Jack Tar in England and in the colonies. The term was used more or less interchangeably along with 'seaman,' 'sailor,' and 'mariner.'

Moon Cussers: From 1793–1833, the average number of vessels wrecked annually on British shores increased from 550 to 800. In England and America, sailing was made even more dangerous by the infamous moon cussers, who set up false lights to lure vessels onto rocks, only to plunder them there. Survivors were often killed to eliminate witnesses. Under a bright moon, however, their ploy would fail, hence the name. Eventually, more and better lighthouses put them out of business.

Navigation Acts: Legislation passed by the English Parliament in the 17th and 18th centuries to promote and protect English industry and commerce against foreign competition. The Acts were originally aimed at excluding the Dutch from the profits made by English trade. The mercantilist theory behind the Acts assumed that world trade was fixed and the colonies existed for the parent country. The Acts required that imports and exports to English territories be carried by English vessels with English crews and that colonists could export certain items only to another colony. The only people who were allowed to trade with the colonies had to be British citizens. Items such as sugar, tobacco and cotton wool, which were produced in the colonies could be exported only to British ports. The Acts also attempted to prevent manufacturing in the British colonies that might threaten the industrial economy of England. Before 1763, the English civil war and the Glorious Revolution were taking place in Europe. Due to their preoccupation with these wars, the British didn't enforce the Navigation Acts. Colonists stopped following the laws, and smuggling & bribery became common practice throughout the colonies. The colonists began trading with non-British colonies in the Caribbean, which contributed to the prosperity of many colonial merchants and farmers. During and after the French and Indian War (1754–63), Parliament sought to increase revenues by enforcing these laws, levying heavier duties under the Navigation Acts. The colonists sternly objected and these Acts aroused great hostility in America, precipitating the Revolutionary War. The Navigation Acts were finally repealed in 1849.

Privateering: During the Revolution, privateering was legalized piracy. Under a state or Continental letter of marque, a privately owned vessel was authorized to take enemy vessels as prizes. There were 626 letters of marque issued to Massachusetts by the Continental Congress — some thousand more by the General Court.

Shanghaiing: The practice of conscripting men as sailors by coercive methods such as trickery, intimidation, or violence. Those engaged in this form of kidnapping (usually by drugging) were known as **crimps**. This method of securing sailors for voyages to eastern Asia generally took place in the NW United States in the mid to late 1800s.

Smuggling: Esther Forbes wrote: "Much of the 'extensive commerce' Thomas Hancock and his fellow merchants had 'turned their view' towards what might (by a purist) be considered smuggling." "We called it free trade—the British called it smuggling." —Morison, p.27 "Regulations of the colonies were framed for the benefit of the Mother Country, not the colony. The wants and needs of the colonists were ignored or taxed or hamstrung or denied in many arbitrary and vexatious ways. Interpretation of the regulations was often capricious. Smuggling became the understood and accepted method to make the system 'work.' " —Seaburg, p.41 "For the first time, the Navigation Acts were to be enforced and the money due England collected. Sympathy with smugglers was so universal, customs officials could not get an unbiased jury. Admiralty courts, which needed no juries, were established, but evidence couldn't be collected. The most conservative were as bitterly opposed as the most radical. The enforcement of these old laws, which had never been obeyed, was such an innovation and led so directly to the Revolution, Charles Francis Dana could say with considerable accuracy on the 100th anniversary of Lexington, 'The King and Parliament were the revolutionists. We were conservators of existing institutions. They were seeking to overthrow and reconstruct on a theory of Parliamentary omnipotence… we broke no chains.' " —Esther Forbes, p.63

APPENDIX C • **Additional Information** on **Hancock Wharf** and **Union Wharf**

Hancock Wharf: In May 1768, one of Hancock's ships, the *Liberty*, arrived in Boston with a load of Madeira. The custom officers did not inspect the ship until the next morning, when they found the ship was less than one-quarter full. The agents claimed that no wine had been unloaded during the night. The next month, while the warship HMS *Romney* was in port, one of the custom officers now said that he had been forcibly held on the *Liberty* and was threatened with death if he told about it. The government seized the ship. A mob gathered at the homes of the custom officers, smashing their windows and threatening to attack the custom officers if they returned.

Hancock was able to obtain the release of the *Liberty* until the case came up in court. James Otis and Samuel Adams accused Hancock of capitulating to the government, in response to which Hancock canceled his deal to recover the ship. In August, the charges against Hancock were dropped, but his ship was ordered forfeited. In November, after British troops had arrived, Hancock was again arrested for smuggling on the *Liberty*. After three months, with no evidence or eyewitness testimony to his guilt being presented, he was acquitted. In February 1769, the events associated with the *Liberty* caused Parliament to order the Massachusetts Governor to apply the Treasons Act 1534, commanding those suspected of treason to be brought to England.

John Hancock vehemently protested these new taxes, and continued to import tea without paying the duty. As a result his ship, *Liberty*, was seized, its cargo of tea confiscated, and he was arrested and charged with smuggling. John Adams mounted a rigorous defense in court, and the case was eventually dropped, but anger swelled in Boston. Hancock then organized an incredibly successful boycott of East India Tea, and over the next several years the company's sales dropped from £320,000 to £520.

Lewis Wharf: It has long been said that Edgar Allen Poe's masterpiece of the American Gothic genre, *The Fall of the House of Usher* (1839), was inspired by events that took place in the Usher House, an actual home on Lewis Wharf. An elderly Mr. Usher purportedly trapped his cheating young wife and her seaman lover in their secret trysting place—an underground tunnel. During the demolition of Usher House in 1800, two skeletons (allegedly belonging to the young couple) were found in the wreckage, embracing each other.

Note: On Lewis Wharf's south side near the Harbor, Carl Koch designed the Ruth Chamberlain Koch Memorial Park in the 1970s in honor of his late wife. A hidden gem, the space features an herb garden, a fountain and seating enclosed by foliage.

Howe & Bainbridge, Inc. 220–230 Commercial Street (Across the street from Lewis Wharf)
"Founded in 1917 as Howe and Bainbridge, Bainbridge International is one of the longest established sailcloth manufacturers in the world with over 85 years' experience in developing and manufacturing sailcloth. Originally the business served commercial sailing vessels, supplying sailcloth for traditional sailing vessels. Over the years, it became progressively more focused on the needs of the leisure sailing market, but also diversified into many other none-marine markets." —bainbridgeint.com The building became condominiums c.1989.

Union Wharf: "While a portion of the **Union Wharf** bulkhead was constructed in the late 18th century, it did not assume its present form until 1845 when merchant John L. Gardner purchased it. The wharf's construction is typical of Boston's 19th-century waterfront, which used timber cribs filled with rubble stone to form the perimeter. Earth filled the interior and granite blocks placed alongside the cribs formed a durable, protective seawall. The wharf's surface is now covered with a variety of paving materials, including granite pavers, asphalt and landscaping. Gardner expanded the wharf to the north to create a larger building site and erected a granite-faced warehouse, which is the major building occupying the wharf today. Completed in 1847 on the NW section of the property, the warehouse was initially 4 stories tall. The fifth level is a 19th-century brick addition. Gardner sold the property to the Union Wharf Company in 1847, but apparently retained the principal interest. The U.S. government subsequently leased Union Wharf as a bonded warehouse. By the late 19th century, the ports of New York and Philadelphia gradually became more important to maritime commerce than Boston. In response to this shift, Boston became a center for steamship lines and railroad terminals.

In 1900, Union Wharf was purchased by Metropolitan Steamship Company, which already owned nearby India Wharf and operated steamers between Boston and cities and towns in Maine. After experiencing several periods of reorganization, the Metropolitan Steamship Company eventually sold the property to Robert P. Gable and Frank Leeder in 1945. The J.L. Kelso Company used the warehouse for storing goods until it was sold to Union Wharf Development Associates in 1977, who converted it to housing. Today, six buildings occupy Union Wharf, but only the warehouse is considered historically significant." — www.nps.gov/nr/travel/maritime/uni.htm

APPENDIX D • Types of Vessels (a selected listing)

Barkadeer: A small pier or jetty vessel.
Barge: A boat of a long, slight and spacious construction.
Barque: A sailing vessel with 3 or more masts, square-rigged on the fore and main and with only fore-and-aft sails on her mizzenmast or aftermast.
Barquentine: Resembling a barque, but square-rigged on foremast only.
Boat: Small open craft without decking and propelled by oars, sometimes assisted by a small lugsail on a short mast.
Brig: Originally an abbreviation of brigantine, but later a 2-masted, square-rigged sailing vessel.
Brigantine: A 2-masted ship, rigged square on the foremast, and fore and aft with square topsails on the mainmast.
Cutter: A one-masted vessel rigged with a gaff mainsail, topsail, headsails and usually a square topsail.
Dory: A fisherman's dugout. Small rowing vessel with narrow, flat bottom and high sides curving outward.
East Indiaman: The name given to ships of the various East India companies. These ships were highly gilded and decorated with carving, often well-furnished for the comfort of passengers and crew, and provided large cargo space. They were always well-armed as warships to protect against pirates and warships of other nations. The English and Dutch companies built and serviced their own ships and maintained them in their own private dockyards.
Frigate: A large vessel of at least 22 guns. Any small cruising warship. Usually three-masted and fully rigged.
Galleon: 3 or more masts, lateen (triangular)-rigged aftermasts, square-rigged fore & main masts. Used as warship or for trade.
Gig: A light, narrow ship's boat, built for speed.
Jollyboat: A small ship's boat, used for a variety of purposes. It was clinker-built, propelled by oars, and was normally hoisted on a davit (crane-like device) at the stern of the ship.
Ketch: A vessel fitted with two masts (i.e. the main and mizzen masts).
Lighter: A large, open, flat-bottomed boat, with heavy bearings, employed to carry goods to and from ships. An open or covered barge equipped with a crane and towed by a tugboat. Used mostly in harbors & inland waterways.
Longboat: The largest ship's boat.
Lugger: A small vessel with four-cornered cut sails, set fore-and-aft, and may have 2 or 3 masts.
Packet: A small vessel usually employed to carry mails between ports.
Pinnace: A type of ship's boat that was rowed with 8 oars (later increased in length to take 16 oars).
Privateer: An armed merchant ship, licensed by a letter of marque to cruise against enemy ships to her owners' profit.
Prize: An enemy vessel captured at sea by a ship of war or privateer. The word also was used for a contraband cargo taken from a merchant vessel and condemned in an Admiralty Court.
Schooner: A small vessel rigged with fore-and-aft sails on 2 or more masts; required a smaller crew than a square-rigged vessel of comparable size. A sailing vessel with at least 2 masts with all lower sails rigged fore and aft.
Ship: From the Old English *scip*, the generic name for sea-going vessels (as opposed to boats). Initially ships were personified as masculine but by the 1700s, almost universally expressed as feminine. In strict maritime usage signified a vessel square-rigged on three masts. With the advent of powered ships, any vessel that carries smaller boats is now also called a ship. *Note:* In the Royal Navy, a three-masted ship would have to be called a ship, and could not be commanded by anything less than a Post Captain.
Ship of the line: A line-of-battle ship.
Sloop: A small man-of-war, rigged as a ship, brig or ketch. A single-masted vessel rigged fore and aft with a long bowsprit, much favored by the pirates because of its shallow draught and maneuverability. *Note:* In the Royal Navy, any boat commanded by a Captain is a ship. If the commander isn't ranked a Captain, it was a "sloop of war."
Smack: A sailing vessel usually sloop-rigged, used in coasting or fishing.
Tender: A vessel employed to assist or serve another, an auxiliary vessel. Towed or carried by another ship.
Transport: A cargo vessel engaged by the government to convey troops, convicts, or stores, (invariably these were chartered merchantmen — the Navy owned and manned only a small number).
Whaleboat: An open boat, pointed at both ends to be convenient for beaching either on the bow end or the stern. It had no rudder — steered by an oar over the stern. A whaling ship carried as many as 6 or 8 whaleboats.
Whaler: The vessel, with its complement of whaleboats, which sailed to catch whales with hand-thrown harpoons.
Wherry: An open boat used for the carriage of passengers on the tidal reaches of the River Thames. Light rowing boat used in inland waters and harbors.

APPENDIX E • WATER QUALITY — THE BOSTON HARBOR PROJECT

*Information in this appendix comes from **The State of Boston Harbor Mapping the Harbor's Recovery**, Massachusetts Water Resource Authority, 2002, and from www.MWRA.com.*

Boston Harbor, like most harbors in metropolitan areas, long suffered from wastewater contamination from industry and residences. Industrial pollution includes heavy metals and toxic chemicals; poorly treated or untreated sewerage discharges contain bacterial and viral disease-causing contaminants. Both endanger marine life, make swimming a dangerous recreation, and affect water clarity. The Boston Harbor Project (BHP) was created to address serious concerns about the impact of an increasingly polluted harbor on Boston's citizens and its future.

The BHP began in 1986 and ended in 2000. A 1985 federal court order charged the newly formed Massachusetts Water Resource Authority (MWRA) with building new sewage treatment facilities that would end the discharge of untreated and partially treated sewage to Boston Harbor. The project required four major construction efforts: treatment facilities at Fore River Shipyard in Quincy; a new wastewater facility at Deer Island [1] to replace the undersized, failing Deer and Nut Island facilities; a tunnel from Nut Island to the new Deer Island facility; and an outfall-diffuser system to discharge treated effluent 9.5 miles offshore into Massachusetts Bay. In addition, the MWRA is addressing the problem of sewer overflows that, in the 1980s "discharged an estimated 3.3 billion gallons of partially treated or raw combined sewage annually." [2] Combined sewage outflows (CSOs) occur when municipal storm drain systems handle excess rainfall by combining the storm drain and sewage systems.

Completion of the Project has greatly reduced industrial and sewage pollutants. Many industrial pollutants have been eliminated at the source. Newer treatments of sewage, including ending sewage sludge discharges in 1991 (sludge is now taken to landfills) has rapidly improved the floor of the harbor. Levels of lead and other heavy metals "are about half of what they were 20 years ago." [3] Less organic material is settling, and sediments are more oxygenated, which is good for bottom-dwelling organisms or benthos. The benthos is now more abundant and diverse. The MWRA describes the recovery of the benthic community as some its "most exciting findings." [4]

> Since Boston Harbor is an estuary that receives outflow from three rivers — the Charles, Mystic, and Neponset — it is affected by any pollution carried by those rivers. Both the Charles and the Mystic continue to have water quality problems, although the Charles' water quality has dramatically improved during the past ten years. Water quality for the Mystic has only improved slightly, and all three rivers have poorer water quality than the harbor. The Neponset watershed is less polluted than the others but does have some bacterial contamination from leaking septic systems and some toxic chemicals in sediments.

MWRA studies of fish and shellfish consist of testing blue mussels, lobster, and flounder. Flounder and lobster are collected near Deer Island, while mussels are collected "from relatively pristine sites" and placed in cages near Deer Island and in the Inner Harbor for 60 days. Prevalence of liver disease in flounder is now much lower than it was in the 1980s, and "levels of mercury, PCBs, and pesticides… are well within" FDA guidelines. Although lobsters are healthy, they should not be eaten because PCBs are above FDA guidelines. Mussels, chosen for testing because they feed by filtering particles out of the water, have lower PAHs [5] than in the 1990s, while PCB and pesticide levels have been stable for decades and are within FDA guidelines.

Boston Harbor's eight beaches (Short, Winthrop, Constitution, Pleasure Bay, Carson, Malibu, Tenean, and Wollaston) "are generally swimmable." Sampling for enterococcus bacteria from1996–2001 shows that six of the beaches met the standard 92% to 96% of the time. Tenean, at 86%, and Wollaston, at 87%, had more frequent problems. The MWRA has significantly reduced untreated sewage discharges, eliminating them from the Neponset River and plans to eliminate them from South Dorchester Bay near Tenean and Malibu Beaches.[6] The MWRA points out that "although the 'Boston Harbor Project' is finished, the 'Harbor Cleanup' is not." Efforts continue to remove effluent from the shoreline and to clean up the tributary rivers.

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[1] Deer Island is actually a peninsula. A 1938 hurricane filled Shirley Gut, which once separated Deer Island from the mainland, with sand. A 2.6 mile perimeter walkway provides views of the island and Boston's skyline.
[2] The State of Boston Harbor, p.2.
[3] Ibid., p.18.
[4] Ibid., p.21.
[5] PAH: "Polycyclic aromatic hydrocarbons. Complex organic chemicals found in petroleum and in products of fossil fuel combustion. Many PAHs are known carcinogens." Ibid., p.26.
[6] Ibid., p.10.

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