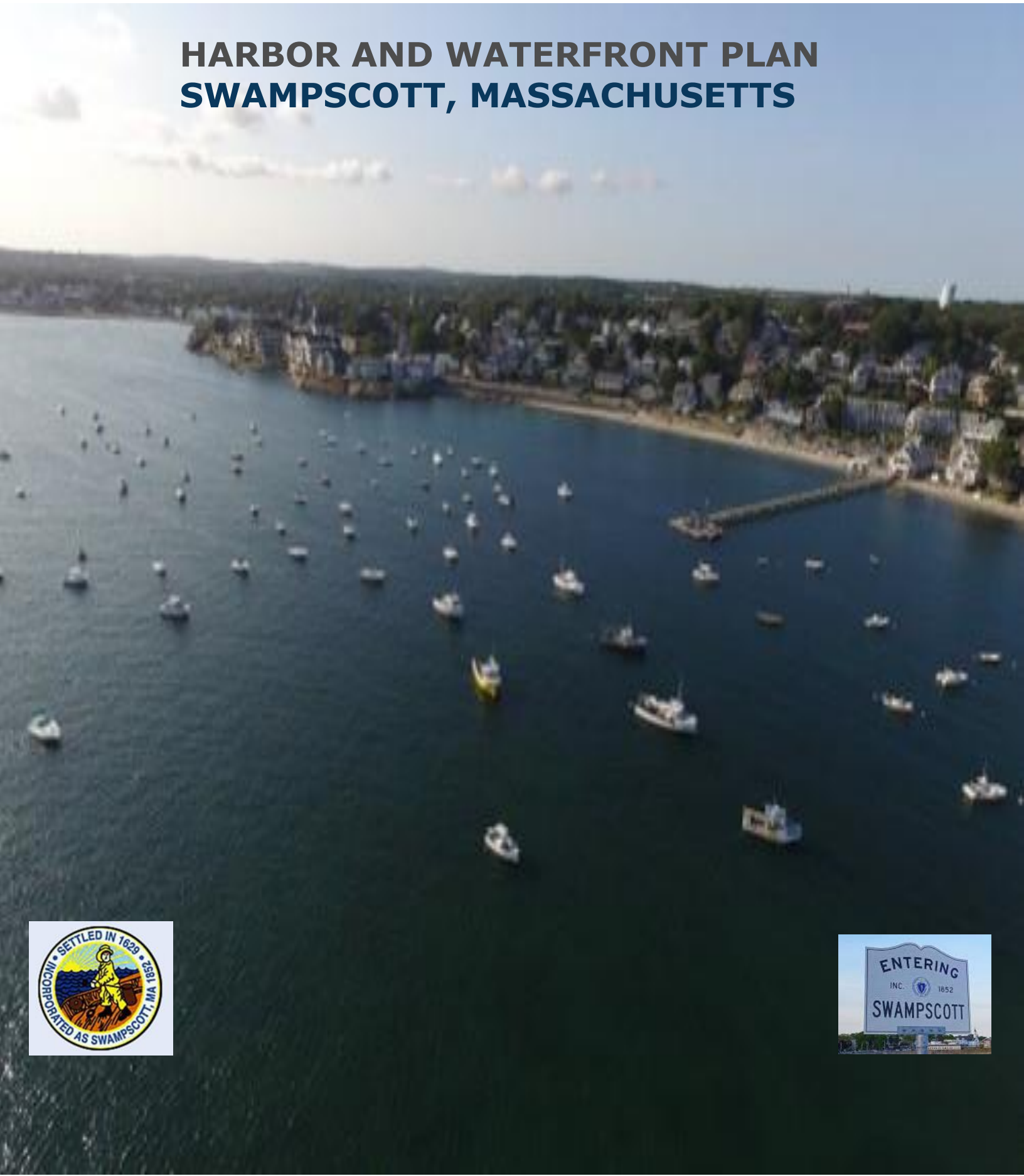


HARBOR AND WATERFRONT PLAN SWAMPSCOTT, MASSACHUSETTS



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Harbor and Waterfront Advisory Committee
Town of Swampscott
(with Cove Harbor Associated Partners - Swampscott)

With Input From:
Ramboll US Corporation
Ref No. 1690001060

EXECUTIVE SUMMARY

The recommendations provided in this Harbor and Waterfront Plan are designed to promote and protect Swampscott's coastal resources and to ensure that Swampscott's historical character as an iconic seaside community continues well into the next century. Swampscott's identity is deeply rooted in its harbor, waterfront, and coastal environments. After many centuries, the town's greatest assets are still its coastal resources. Ensuring that these assets are protected is critical to assuring that current and long-term needs and interests of Swampscott's residents are met, and that use of Swampscott's coastal environments can be promoted to visitors and tourists. With this in mind, protecting Swampscott's coastal resources will help generate much-needed economic activity, especially along the waterfront. The advent of climate change, and its potential to damage Swampscott's coastal resources, increases the importance of planning for the future.

This Plan attempts to provide a menu of potential actions that may be taken by the Town to enhance and protect its coastal resources, both natural and man-made. The Plan identifies vulnerable coastal resources that are at risk to current and long-term effects of extreme weather events. The increased frequency and severity of extreme weather such as coastal flooding, shoreline erosion, as well as inland flooding, are fueled by climate change. The Plan also lays out overarching objectives and associated short-term and long-term primary goals. The Plan identifies potential adaption and mitigation strategies: infrastructure improvements, such as building additional barriers to storm surge (created by powerful coastal storms), increased sea level height, and/or storm induced destructive waves. Additionally, the Plan provides specific enhancements to Swampscott's coastal resources that will promote economic and social benefits to the Town.

The Purpose of the Plan

The purpose of the Harbor and Waterfront Plan is to provide recommendations to the Town of Swampscott Board of Selectmen and to the residents of Swampscott related to protection and enhancement opportunities for Swampscott's harbor and waterfront and near coastal resources. The Plan will serve as a vehicle to help coordinate harbor and waterfront development activities in concert with other Town plans and priorities, including those outlined in the Swampscott 2025 Master Plan, Swampscott's Open Space Recreation Plan, the Swampscott Downtown Vision and Action Plan, the Swampscott Community Development Plan, the Coastal Climate Change Study, the Downtown Humphrey Street Parking Plan, the Swampscott Rail Trail Plan, and the Humphrey Street Overlay District proposal. As coastal conditions and Town priorities change, the Plan will need to evolve. The Plan is a living document and will be updated as coastal conditions and Town priorities change. The Harbor and Waterfront Advisory Committee (HWAC) are the stewards of this plan and commit to re-evaluating the priorities of the plan and revising the document every five (5) years.

The Harbor and Waterfront Plan is Specifically designed to:

- Promote mitigation and adaption measures that address current and future effects of sea level rise, storm surges and storm-induced destructive wave action due to extreme weather events associated with climate change;
- Strengthen protection of the Town's coastal environment;
- Maintain the Town's scenic character and rich maritime history;
- Increase public awareness and access to the harbor and waterfront including, but not limited to boating, fishing, both commercial and recreational, and other water sports;
- Support sustainable economic development in the Town; and

- Help coordinate and collaborate with local, state, and federal agencies and regulators to ensure that the Town can take advantage of local, state, and federal funds as they become available.

Recommendations

The Harbor and Waterfront Plan recommends the following integrated actions relative to future uses of Swampscott's harbor and coastal resources.

- Fund a comprehensive engineering design, obtain regulatory permission, and procure funds to build a Protective Living Reef (PLR) for Swampscott Harbor that will protect the harbor and the Fisherman's beach waterfront from storm damage.
- Fund an engineering dredge plan, obtain regulatory backing and procure funds to undertake harbor dredging to optimize natural resource needs and fishing/recreational boating needs for Swampscott Harbor.
- Design a coastal walkway that provides waterfront protection from increased sea level rise and storm damage and secure funding for the walkway.
- Increase protective measures to Swampscott's barrier beaches and provide better accessibility and amenities to those resources.
- Pursue funding and build infrastructure for enhancing access to Swampscott's coastal resources.
- Promote Swampscott's economy by promoting Swampscott's waterfront for its residents and visitors.
- Protect and enhance the environmental quality of Swampscott's coastal resources.
- Ensure that public investment in Swampscott's coastal resources results in investments in infrastructure that will be sustainable over the long term.

These recommendations are inclusive of the long and short-term recommendations provided in Section 5 of the Harbor and Waterfront Plan.

1. SWAMPSCOTT'S HARBOR AND WATERFRONT

Swampscott's identity is deeply rooted in its history. Promoting the town's historic and cultural assets - historic structures, landscapes - and telling the town's stories not only raises awareness of these resources, but also strengthens the case to preserve and protect them. Celebrating these assets will be critical to ensuring that residents needs and interests are met and in attracting tourists to Swampscott, generating much-needed economic activity, especially along the waterfront.

Swampscott, Massachusetts is a community that has been shaped by the sea. In its early years, fishing was the major economic engine of the town with dories and "jiggers" as the main fishing fleet until replaced at the turn of the 19th century with schooners. Cod and mackerel were the principle catches of the day. Boatbuilding was also an important part of Swampscott life, and the Swampscott Dory, now enshrined on the Town Seal, was a famous design for fishermen.

The advent of rail service in the mid-1800's was a pivotal event in the transformation of Swampscott from quaint fishing village to elite summer resort - and it was the eye-catching seacoast that hooked the tourists in. By the late 19th century, Swampscott's renown as a seaside resort was widely recognized and grand resort hotels, such as the Lincoln House and the Ocean House were built. The eastern portion of the Swampscott shoreline was subdivided to form seaside estates where the wealthy members of Boston society would spend their summers.



The end of the 19th century saw the town becoming a desirable commuter suburb for families and professionals - a trend which continues to this day, as reflected in a recent Boston Globe Magazine article highlighting Swampscott in its "2013 Top Spots to Live." The article featured a photo of the Swampscott coastline, identified as a part of the eastern Massachusetts Communities where the real estate market is thriving.

There have been many changes over the years - rapid development has led to a loss of connectedness with the waterfront and challenges in managing Swampscott's harbor and waterfront. After many years, Swampscott's greatest asset is still its proximity to the sea. This Harbor and Waterfront Plan is designed

to promote and protect this valuable asset and ensure that Swampscott's historical character as desirable seaside town continues into the next century.

1.1 Purpose of the Plan

The purpose of the Harbor and Waterfront Plan is to provide recommendations to the Town of Swampscott Board of Selectmen to guide development and evolution of the Town's harbor and waterfront, and to coordinate harbor and waterfront development activities in accordance with other Town plans and priorities, including, in particular, the Swampscott 2025 Master Plan, Swampscott's Open Space and Recreation Plan, Swampscott Downtown Vision and Action Plan, Swampscott Community Development Plan, Coastal Climate Change Study, Downtown Humphrey Street Parking Plan, Swampscott Rail Trail Plan, and the Humphrey Street Overlay District proposal.



The Harbor and Waterfront Plan is specifically designed to:

- Increase public awareness and access to the harbor and waterfront, boating and other water sports.
- Maintain the scenic character and rich maritime history of the Town.
- Support sustainable economic development.
- Ensure that necessary infrastructure improvements are made to protect the harbor and waterfront.
- Take measures to address future storm surges and sea level rise.
- Strengthen environmental protection.
- Coordinate and collaborate with local, state, and federal regulators and take advantage of state and federal grants.
- Assist in prioritizing existing maintenance and replacement activities.
- Guide planning efforts through identification of potential enhancements.
- Identify a pathway for creating a resilient coastline and provide alternatives for protective measures, particularly those aimed at protecting life, property, and the historic structures and nature of the Town.
- Establish a platform for proposals for new and attractive amenities that will increase the desirable nature of the Town for residents and visitors alike.



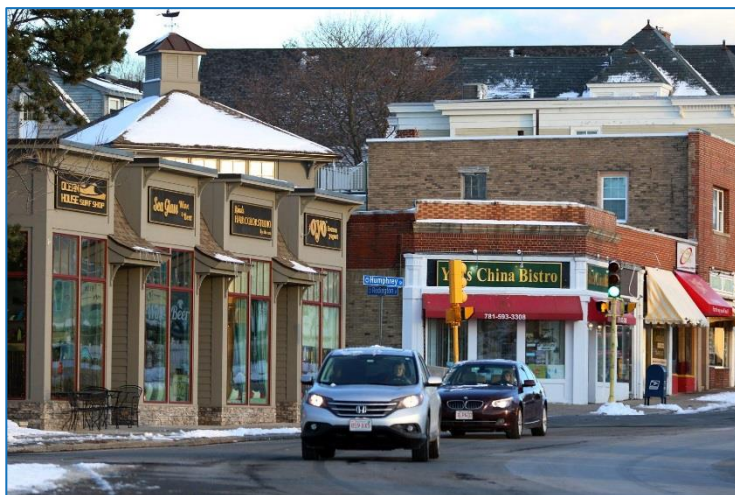
2. BACKGROUND AND EXISTING CONDITIONS

Located just thirteen miles northeast of Boston, Swampscott is an approximately 3-square-mile pie-slice-shaped piece of land that fits into the mainland located between the Towns of Lynn to the south and Salem and Marblehead to the north. The town is home to approximately 13,800 residents and was first settled in 1629. The eastern portion of the Town of Swampscott borders Nahant Bay in the south and Massachusetts Bay in the north. These waters of the Atlantic Ocean are Swampscott's greatest resource.

2.1 Municipal Infrastructure

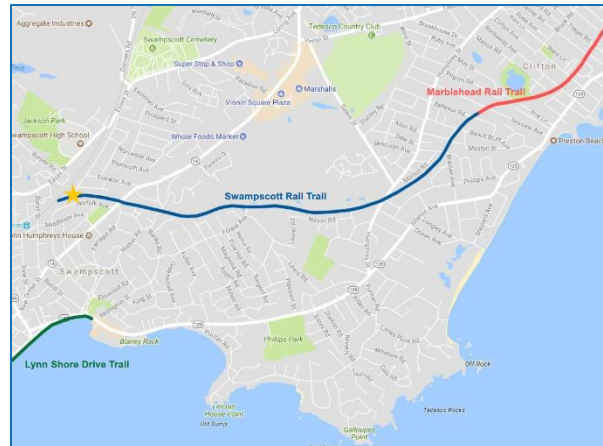
The Town of Swampscott is part of the 85-mile Essex Coastal Scenic Byway, and its scenic resources and unique environments are linked to its historic settlement patterns which were shaped by the natural environment. The history of this region is defined by water, and the scenic view one has when approaching Swampscott from Lynn is the dramatic grand sweep of ocean from the Lynn Shore Reservation to the Swampscott Monument Mall area. Residents, visitors, and passers-by are encouraged to get out of the car and stroll the boardwalk, bike, jog, or relax on a park bench and take in the view.

There are two major streets in town: Paradise Road (Route 1A) on the north side of town and Humphrey Street (Route 129) on the south side of town, along the waterfront. The Massachusetts Bay Transportation Authority (MBTA) North Shore commuter rail line provides Swampscott with regular passenger service to Boston and to communities to the north. The train station is approximately one mile from the waterfront and, therefore, does not provide direct waterfront access. The MBTA also provides regular bus service in the town that connects with its regional network; however, the buses service Paradise Road, located on the northern side of Town and not in the vicinity of the waterfront.



Humphrey Street is Swampscott's "historic downtown" which was the community's heart during its earlier days as a fishing community. The economic center has been retained over the centuries up to current day. The corridor features numerous small retailers in a location adjacent to the waterfront amenities including beaches and the harbor. Although the area features several successful retailers and restaurants, the corridor currently lacks an identity, can be difficult to maneuver (by foot, bicycle and car), is not visually cohesive, and does not maximize its strengths – the waterfront and regional automobile traffic. However, Humphrey Street holds potential to become a more attractive destination – for residents and tourists alike.

Swampscott provides many bikers, walkers, and runners with beautiful ocean views along Humphrey Street. The Marblehead Rail Trail extends briefly into Swampscott by Beach Bluff Avenue. Construction is planned to extend the trail through Swampscott along the old railroad line. The proposed trail would run for 1.1 miles from Walker Road to Beach Bluff Avenue connecting to Seaview Avenue in Marblehead thus connecting the two trails. The desire for the rail trail has been supported by a number of Town Meeting votes as early as the 1970's.



A survey of residents was performed in late 2012 by the Open Space & Recreation Plan Committee. Through this survey, it was determined that of the eight most resident-visited recreation, open space and conservation areas, the majority are accessed via walking. Public transportation is not widely used within the town, but to travel outside of Swampscott.



There is no bus service within Swampscott to the commuter rail station in Swampscott, as buses are not allowed to travel on Burrill Street, the access road to the commuter rail station. The exclusion of buses on Burrill Street is primarily due to the low clearance commuter rail bridge located on the street. There are, however, bus stops on either end of Burrill Street, as well as its intersection with Paradise Road, approximately a five-minute walk to the commuter rail station.

All water for Swampscott comes from the Massachusetts Water Resource Authority (MWRA) via the Quabbin Reservoir, which is located in Western Massachusetts, after being treated at a plant in Marlboro. It travels to Weston where it branches off, eventually reaching Swampscott via a 16-inch water main on New Ocean Street.

All of the town's sanitary sewage is collected at the Humphrey Street pumping station. Four pumps then move the wastewater to Lynn for treatment where the process becomes screening, grit removal, pre-aeration, primary treatment, secondary treatment, disinfection, and effluent discharge. There are two pump-out locations along the waterfront to receive sanitary sewer from commercial and personal watercraft.

Historic combined sanitary and storm sewer outfalls (CSOs) were located along the waterfront. CSOs were built as part of sewer collection systems that were designed to carry both sewage and stormwater in the same pipe. When there is not a lot of storm water, this mix is transported to a wastewater

treatment plant where it is processed. However, after heavy rainfall or snowmelt, stormwater and sewage can overload the system. Without CSOs, this mix would back up into homes, businesses, and public streets. Among other things, pathogens are in the CSO discharges. There is a combined sewer overflow that (until recently) discharged into Stacey Brook in Lynn. This culverted brook, in turn, ultimately discharged to King's Beach and Nahant Bay. The Lynn Water & Sewer Commission recently conducted sewer separation work which resulted in elimination of the outfall. Issues with pathogens and contamination have historically been associated with the CSO and storm water outfalls along the waterfront; these issues are discussed further in Section 5 of this report.



Swampscott is within the North Coastal Watershed. As stated by Office of Energy and Environmental Affairs (OEEA), "[t]he southern reaches of the watershed [where Swampscott is located] consist of an irregular coastline of rocky peninsulas, interspersed with embayments, pockets of salt marsh and vibrant estuaries." The Town is part of the North Coastal Watershed; it is drained to the ocean by local brooks and streams, many of which are largely in underground conduits.



2.2 Water-sheet and Waterfront Infrastructure

The Swampscott Harbor at Fisherman's Beach is extremely busy during the summer months. Boaters and kayakers alike share the open waters whether staying within the harbor, venturing out to other harbors, fishing, or just enjoying the serenity and solitude that is so plentiful.

According to the Town of Swampscott Harbormasters, Swampscott Harbor, on Nahant Bay, is home port to approximately two hundred commercial and personal vessels. Approximately twenty commercial fishermen currently operate from the Harbor. Commercial fishing boats in the Harbor range in length from twenty-four to forty-two feet. Commercial crews are primarily fishing lobster, and occasionally gill netting for cod and other fish.

Among pleasure craft, lengths run from thirteen to forty feet, with most recreational boaters opting for mechanical power. Sailboats constitute approximately thirty percent of the fleet.

A spindle marker is located approximately one-quarter mile southeast of the harbor and a large nun buoy is located immediately outside the harbor. According to the harbormasters, mariners should approach Swampscott Harbor from the south of the spindle marker and stay to the right/return lane when approaching the nun buoy. The Harbor is a "no wake" area.

Six public beaches and several smaller private beaches are located in the Harbor, as described in Section 2.5. The beaches are marked on the water with swim buoys and "Designated Swim Area" signs.

Swampscott Harbor is serviced with a pier and float system. There is a fifteen-minute tie-up restriction at the floats, however, boats are welcome to "hang off" the pier for longer periods. Fresh water is available at the floats, however there is no shore power available. Low tide depth at the floats can be as little as six feet. The Harbormaster's office is located at the foot of the pier in the Swampscott Fish House, a National Historic Landmark. Public restrooms at the Fish House are open each day from 6:00 a.m. until 6:00 p.m. The Swampscott Yacht Club is situated in the second floor of the Fish House, and also runs a launch service for visiting vessels.

A boat launch ramp is located on the west side of the Town Pier; however, parking for vehicles and trailers in the area is limited. According to the Harbormasters, guest moorings are scarce due to the commercial and seasonal vessels moored at the Harbor. The Harbormaster coordinates short guest stays for visiting vessels.



2.3 Commercial Fishing Fleet

Fishing, agriculture, and manufacturing were the primary industries during the 1600s. Fishing was Swampscott's first industry and continued to be the primary industry following the Revolutionary War. Many innovations in this fishing and seafood processing hail from Swampscott. At the end of the 18th century, Ebenezer Phillips industrialized the Naumkeag's dry fish technique by establishing a processing center for drying cod and shipping it worldwide in barrels.



Fishermen used dories until several residents purchased *the Dove*, Swampscott's first schooner, in 1795. The local fleet grew to include six Chebacco boats, locally called jiggers, by 1826. These were used to catch cod, haddock, pollock, hake, and mackerel. The fleet continued to grow and by 1855 consisted of 39 schooners. Lobstering began in Swampscott in 1808, when the lobster trap was invented by Ebenezer Thorndike. The Swampscott Dory, a modification of earlier fishing boat designs that is still used for fishing today, was invented in 1840 by Theophilus Brackett.

Swampscott's commercial fishing scene exists still today, with approximately twenty commercial fishermen currently operating out of the Harbor. According to the Harbormaster, the fleet is comprised of vessels ranging in length from twenty-four to forty-two feet, and the vessels typically moor at the Town Pier.

2.4 Physical and Environmental Conditions

Swampscott's beaches, wetlands, and water-side environmental resources are critical to its Harbor ecosystems, as well as to the enjoyment and recreation of locals and visitors. The beaches and parks of Swampscott were among the Priority Heritage Landscapes called out in the 2006 Swampscott Reconnaissance Report as part of the Massachusetts Heritage Landscape Inventory program.



2.4.1 Beaches

Swampscott's beaches and their adjoining parks are essential to its coastal identity and history. These were among the Priority Heritage Landscapes called out in the 2006 Swampscott Reconnaissance Report as part of the Massachusetts Heritage Landscape Inventory program. From the Town line with Lynn to the Humphrey Street corridor, these resources include King's Beach, Driscoll Park, Black Will's Cliff, and a small park owned by St. John the Evangelist Church. Moving eastward, Blaney Beach and Reservation includes Fisherman's Beach, the Swampscott Fish House and Town Pier, and Chaisson Park.



From Lincoln House Point to Galloupes Point is Whales Beach, which includes Polisson Park, and an area known as New Ocean House and Eiseman's beaches and the adjoining Johnson Park. From Little's Point to the town line with Marblehead is Phillips' Beach, which features a private beach club, Preston Beach, and Beach Bluff Park. A group formed by Swampscott and Marblehead residents called the Clifton



Improvement Association designed and organized improvements at Beach Bluff Park. Also, near Phillips' Beach is Palmer Pond, a wildlife sanctuary area highlighted for its scenic qualities.

Rounded outcroppings of rocky headlands frame several of the beaches, particularly at Eiseman's Beach and at both the eastern and western ends of Phillips Beach and Preston Beach, where intertidal pools form that provide natural areas for children to play and explore.

Swampscott's six sandy beaches highlight the town's visual character, providing outstanding vistas of Massachusetts Bay. The beautiful landscape features invite residents and visitors to experience it actively and intimately through hiking, swimming, biking, paddling, and boating. Individual beaches are further described in the sections below.

2.4.1.1 King's Beach

King's Beach begins at the Lynn/Swampscott municipal line and extends south along the shore in Lynn to the gateway of Swampscott. The beach forms a deep cove at the beginning of the commercial strip along Humphrey Street. King's Beach is an approximately 1,500-foot-long south-facing beach, located parallel to Humphrey Street for the majority of its length, except for approximately 400 feet at its western end, which is parallel with Lynn Shore Drive.



The western boundary of King's Beach is the municipal boundary with the City of Lynn, which is near the intersection of Eastern Avenue, Ocean Street and Lynn Shore Drive. Located in the vicinity of the western King's Beach boundary is a municipal storm sewer outfall (Outfall 2). To the east, King's Beach terminates at Black Will's Cliff, the bedrock headland (coastal bank) near the intersection of Redington Street and Humphrey Street. On the east side of the Cliff is a small park owned by St. John the

Evangelist Church. This park extends from Humphrey Street to the coast and ends at a point high above the sea. Tall pines filter the view.

The landward portion of King's Beach is a narrow sandy beach with a large seawall forming the landward boundary of the beach for its entire length. The lower intertidal beach is flat and composed of fine sands with a gravel lag deposit on the surface.

A boulevard with new concrete walking surface, lighting and benches has been constructed along King's Beach in Lynn by the Department of Conservation and Recreation (DCR), which owns the beach in Lynn. Swampscott bought its section of the beach from the DCR years ago and because of this the Swampscott portion was not included in the improvements. In January 2013, the Board of Selectmen voted to begin the process of asking the state legislature to have the DCR take over maintenance of King's Beach.

One pedestrian area is located at the town line in Swampscott, in the vicinity of Driscoll Park and adjacent to the beach. The pedestrian area includes a brick terrace at the edge of the beach, as well as the Tomas H. Driscoll Memorial Flagpole, benches, and raised planters.

Public transportation and nearby eating establishments made this a once-popular swimming beach. King's Beach remains a public beach with swimming; however, due to the increase in algae blooms (the brown algae *Pilayella littoralis*), the bacteria contamination from storm and combined sewer overflows in the area, and the fact that there are no lifeguards, it is not often used for swimming on the Swampscott side.



Beach parking is available in marked spaces along Humphrey Street and on Lynn Shore Drive. No vehicles (other than authorized Town vehicles) are permitted on this beach. No boating is permitted.

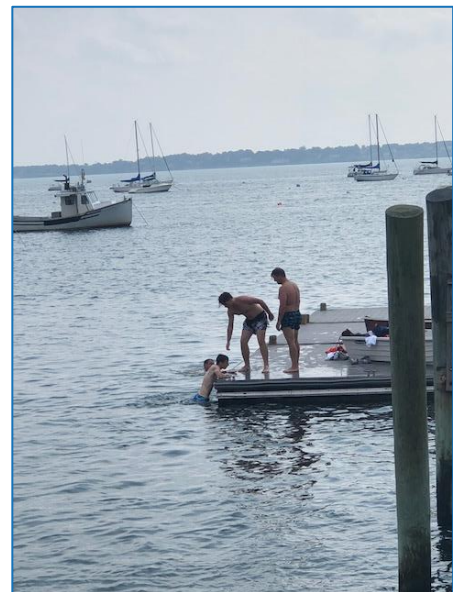
King's beach may be accessed at the following points:

- via Humphrey Street near Lynn border;
- by stair from the walkway along the seawall;
- by vehicle (DPW only) via a ramp located at town line; and
- via public parking along Humphrey Street.

2.4.1.2 Blaney Beach and Reservation - Fisherman's Beach

Blaney Beach and Reservation comprises public and private beach, including Fisherman's Beach, the Fish House (listed on the National Register of Historic Places), Chaisson Park and the Fish House Pier (also referred to as the Town Pier). Several important memorials are located in Chaisson Park, at the western end of Fisherman's Beach, including a War of 1812 cannon, an aviation sculpture and the Seaman's Memorial, which is the anchor from the Tedesco, the ship that sank off Galloupes Point in 1857.

Fisherman's Beach is a south-facing beach, with the eastern portion of the beach located parallel to Puritan Road and the western portion of the beach parallel to Humphrey Street. It is a pocket beach with bedrock headlands defining both the east and west ends. The east end of the beach is located adjacent to Lincoln House Point Road; the west end is located near the intersection of Fuller Terrace and Humphrey Street (Route 129). The upper portion of Fisherman's Beach tends to be sandy, and the lower portion is a relatively flat intertidal beach, which tends to be more gravel-laden sand. A survey



of Fisherman's Beach showing beach elevations was conducted in October 2010 and is included as Figure X. Fisherman's Beach has a public boat access ramp located near the center of this beach immediately west of the Town Pier. Immediately east of the Pier is a dedicated fishermen's boat access ramp, which is also maintained by the Town. Chaisson Park, owned by the Town, is located at the west end of Fisherman's Beach, between storm water Outfall 10 and the western beach access-way.

Fisherman's Beach has been traditionally known for its association with 19th century artists and painters. Today, local fishermen and lobstermen still use the Fish House, and the Swampscott Yacht Club holds meetings on its second floor. The beach is enjoyed by beachgoers and is the site for events such as the annual Swampscott Yacht Club's Blessing of the Fleet and Duct Tape Regatta, as well as the annual New Year's Day Polar Beach plunge.



Fisherman's Beach has a special character, because it is used as the main boat harbor and is the site of the Town's fishing pier. Due to its central location and to the park above the seawall, it is perhaps the most accessible beach, both for oceanfront activities and for visual enjoyment. The feeling of enclosure produced by the small scale and crescent shape of Fisherman's Beach is enhanced by the upland cliffs of ledge and till rising directly behind it. These qualities combined with the bustle of fishing and commercial or pleasure boating activities make it one of Swampscott's most attractive beaches for sitting and walking.



The Fish House and Town Pier are a base for lobstermen and fishermen from the area, who dock their boats in the harbor. With the adjoining upland area above the seawall, it is the center of Swampscott's coastal activity. From the Fish House and to the west (including the Pier), the beach and the upland area are owned by the Town and managed by the DPW and Harbormaster. Many smaller craft such as small sailboats, dinghies and kayaks are stored along the beach. The Town Pier has floats on the seaward end that are used to load and unload passengers and supplies to boats.

The Town holds events at Fisherman's Beach, including concerts, bonfires, barbecues, and other celebrations. The Town's summer sailing program is administered from the Fish House and Fisherman's Beach.

Portions of the eastern portion of the beach are privately owned by abutting property owners to the high-water mark. The public is allowed to walk along this portion of the beach. As of 2013, lifeguards are stationed at this beach.

The Town's primary recreational beach area at Fisherman's Beach is located between the public boat access ramp and the western end of the beach. Public swimming at Fisherman's Beach occurs mainly in the beach area west of the public boat access ramp and continues west to where the sandy beach is replaced by boulders. There are no lifeguards on duty for this beach area.



Fisherman's Beach may be accessed at the following points:

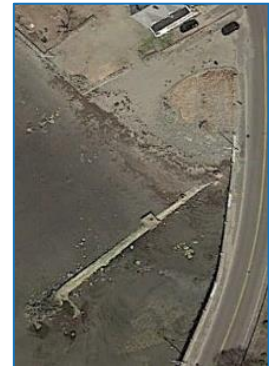
- water access via boat ramp and Town Pier;
- pedestrian and vehicle access at the entrance between municipal parking lot and Chaisson Park (opposite Greenwood Avenue); and
- public parking in the municipal lot and on Humphrey Street.

2.4.1.3 Sandy Beach

Sandy Beach is a small sandy strip of Town-owned waterfront, approximately 250 feet in length. The stretch of beach is located at the far east end of Fisherman's Beach. The land, also known as Francis J. Cassidy Reservation, begins at the right-of-way between Puritan Road and Sculpin Way, and ends at Lincoln House Point. There is a flagpole, a memorial to Francis Cassidy (former town selectman and sailing enthusiast), and two park benches on a sea grass covered dune. There are no lifeguards on duty for this beach area.



Sandy Beach is accessed via a curb-cut drive (Martin Way) via Putnam Road. There is a storm sewer outfall at the eastern edge of Sandy Beach, as shown to the right. To better blend into the scenery, this outfall should be reduced in size and reconstructed to include a floatables separation chamber.



2.4.1.4 Whale's/Eiseman's Beach

Whale's Beach is a wide crescent-shaped beach that extends from Galloupes Point in the east to Lincoln House Point in the west. The northeasterly end of this beach is called Eiseman's Beach. This south-facing pocket beach is located in the middle of the Town's shoreline and runs parallel to Puritan Road. This beach is bound on the east by a bedrock headland which is located seaward of houses that abut the west side of Puritan Lane on Galloupes Point and extends to the west to another bedrock headland just to the east of Lincoln House Avenue. This beach is primarily sandy with rocky intertidal shoreline areas fronting and in proximity to the bedrock headlands.



Two parks are associated with this 1,840-foot beach: Paul A. Polisson Park on the western side of the beach and Richard B. Johnson Park centered along the beach front. The parks and the beach are accessible from Puritan Road and local residents can park at Phillips Park on Humphrey Street when using the parks and Whale's Beach. Polisson Park is named after a prominent resident, Paul A. Polisson. Johnson Park, named after another prominent Swampscott citizen, Richard B. Johnson,

is land once owned by the New Ocean House, a large hotel that was a summer resort until it burned in 1969.

Whale's and Eiseman's Beach is Town-owned, managed by the Recreation Department and maintained by the DPW. There is no conflict with boating or commercial activities at the beach. The entire beach is open to the public, but it is not easily accessible by out-of-town visitors.

The condition of Whale's and Eiseman's Beach is generally good, with a smooth flat sandy surface and relatively clean water and sandy bottom. Current use and recreation potential for Whale's and Eiseman's Beach is high with a variety of possible activities, including surfcasting, picnicking, swimming, sunbathing, children's sand play, dog walking between October and May, body surfing, and paddle boarding.

This beach currently has swimming and there is one lifeguard on duty on the beach area in front of the Town Beach Park. The eastern portion of the beach and Polisson Park do not have lifeguards on duty. Vertical concrete seawalls are located at the Town Beach Park and at Polisson Park. Concrete public access stairs are located at the Town Beach Park. Resident sticker parking is available off Humphrey Street to the north of this beach area. No vehicles (other than authorized Town vehicles) are permitted on the beach.



Whale's/Eiseman's Beach and associated parks may be accessed at the following points:

- pedestrian and vehicle (DPW vehicles only) access via curb-cut paved drive between #259 and #273 Puritan Road;
- pedestrian access via 2 stairways to beach located at Johnson Park, a grassy park facing Eiseman's Beach;
- pedestrian and vehicular (DPW vehicles only) access to beach via abutting sandy/rocky curb-cut entrance near Polisson Park, a grassy park facing Whale's Beach; and
- pedestrian access from resident parking areas behind Phillips Park and Whale's Beach, where a right-of-way path leads to the beach. No parking is permitted on Puritan Road.

2.4.1.5 Phillips Beach

Phillips Beach lies between two rocky outcrops: Little's Point at the southern end and Flirtation Rock at the Marblehead Town line. The northernmost end of Phillips Beach, from the Marblehead line to Ocean



Avenue, is referred to as Preston Beach by residents. That portion of Phillips Beach located south of Preston Beach that runs southward from Ocean Avenue at its north end is approximately 1,400 feet. The combined length of the Phillips Beach/Preston Beach shoreline is 5,260 feet. Phillips Beach is the Town's only barrier beach. It was mapped as a barrier beach in the state Barrier Beach Inventory Project conducted by the Massachusetts Coastal Zone Management in 1982.

Phillips Beach has a well-developed coastal dune system and landward freshwater wetlands with small open-water areas including brackish Palmer Pond, which lies between Atlantic Avenue and Phillips Beach. The sediment grain size of the northern half of Phillips Beach is sandy. The southern half of Phillips

Beach is comprised of mostly pebbles. A wood slat walkway provides beach access across the well-vegetated coastal dunes from the Ocean Avenue beach accessway.

Swimming is allowed at Phillips Beach and there is a lifeguard on duty in the summer. Resident parking is allowed with a Town sticker along Ocean Avenue. No vehicles (other than authorized Town vehicles) are permitted on the beach.

The primary right-of-way to Phillips Beach is via the boardwalk at the end of Ocean Avenue. This entrance permits access for the mobility impaired, as it is relatively flat and enhanced by the seasonally installed planked boardwalk which extends from the right-of-way on Ocean Avenue to the beach. The boardwalk is on privately-owned land, is open to the public and maintained by the Friends of Phillips Beach. On-street parking on Ocean Avenue is restricted to town residents with current recreation stickers between May 1 and October 1. There

is one small pedestrian path Right of Way located between private homes, 80 and 86 Phillips Beach Avenue. The right of way is unmarked and there is no parking on Phillips Beach Avenue. The entire beach is open to the public and maintained by the DPW. The condition of Phillips Beach is generally good, with relatively clean water and sandy bottom. There are some ongoing litter problems, and debris from occasional bonfires mar the appearance of the beach



above the high tide line. The Friends of Phillips Beach carry out an annual beach cleanup in May that contributes to keeping the beach in good condition. Current use and recreation potential for Phillips Beach is high with a variety of activities available, including surfcasting, picnicking, swimming, sunbathing, children's sand play, bird watching by the ponds behind low dunes, dog walking between October and May, surfing, paddle boarding, and launching for small boats. This beach is staffed with lifeguards from Recreation during the summer hours.

Palmer Pond and Phillips Beach may be accessed at the following points:

- pedestrian access to Phillips Beach via Ocean Avenue extension, a sandy/rocky curb-cut entrance between the Swampscott Beach Club and Phillips Beach.
- pedestrian access to Phillips Beach and Palmer Pond conservation area via a boardwalk extending off the Ocean Avenue extension.
- vehicle access to parking on Ocean Avenue with resident permit.
- pedestrian access via a wooden walkway right-of-way to Phillips Beach (rocky end) located between 80 and 86 Phillips Beach Avenue.

2.4.1.6 Preston Beach

As noted above, the northern-most portion of Phillips Beach is referred to as Preston Beach by residents. Preston Beach, a sandy beach armored by seawalls, spans the border between Marblehead and Swampscott. There is a small park at the access point to Preston Beach Bluff Park. The land for the park was donated by the Blodgett family in memory of John and Ruth Blodgett in 1999. A public-private partnership was formed with a group of Marblehead and Swampscott residents, the Clifton Improvement Association, designing the park with a boardwalk, memorial benches, and landscaping with tall coastal grasses, thistle, and beach roses.



Preston Beach is the northern-most beach in the Town. It extends from the Marblehead town line approximately 2,000 feet southward to the vicinity of Blodgett Avenue. Preston Beach is seaward of Atlantic Avenue. At the northern end of the beach is the beach accessway at Beach Bluff Avenue. Preston is a narrow beach with the high tide line at the toe of the seawall. It is composed of fine sand with some gravel near the low tide line. For most of the length of the beach, a concrete seawall with large rip rap rocks fronts residential homes. The seawall and rip rap are owned and maintained by the respective property owners.

Swimming is allowed at Preston Beach. However, there are no lifeguards on duty. Resident parking with sticker is allowed on Atlantic Avenue. No vehicles (other than authorized Town vehicles) are permitted on the beach.

Rocky headlands at the Marblehead end shelter tidal pools full of marine life, such as hermit crabs, anemones, sea urchins, and sea stars. Here, the beach is gently sloping, and small sand-filled tidal pools often form at low tide. They provide a safe swimming area for young children. The gently sloping, smooth expanse of Preston Beach in summer turns into a much steeper, boulder-strewn beach in winter. Winter storm-generated wave action transports sand from the beach to a sandbar, where it remains until longer-cycled summer waves moves the sand back to the beach. Little sand is lost during this annual cycle because the shore currents that run parallel to the beach are weak.

Preston Beach can be considered to be in good condition, with daily high tides “sweeping” and smoothing the beach sand. However, much of the beach is covered at high tide, limiting its use for traditional recreational beach activities such as walking, jogging, sunbathing, children’s play, etc., to times of day when the tide has ebbed.



Swampscott's right of way to the beach exists between Beach Bluff Park and 441 Atlantic Avenue. This right of way is strewn with rocks and sand and is not accessible to people with disabilities. It consists of either a cobbled slope to the water or a cement stairway with railing descending sharply from Beach Bluff Park. Beach Bluff Park abuts the beach and is accessible from the street via planked pathways for viewing, strolling, picnicking, and sunbathing. Beach Bluff Park has a number of architectural and artistic amenities, including a stone sundial, walking paths, and benches. As noted, there is also a stairway from the park to the beach. In the summer, parking is available on Atlantic Avenue with town recreation stickers or in a lot across the street from the park for a daily or seasonal fee.

Preston Beach may be accessed at the following points:

- pedestrian access via steps from Beach Bluff Park.
- pedestrian access via the sandy and rocky curb-cut entrance between Beach Bluff Park and 441 Atlantic Avenue.
- vehicle access to parking on Beach Bluff Avenue with a resident permit.

2.4.2 Environmental Conditions

Off Fisherman's Beach in Swampscott's shallow harbor, a significant area of eelgrass offers habitat for juvenile fish and crustaceans. Palmer Pond, an unusual geologic feature, is separated from Phillips Beach by a low barrier dune, creates a scenic vista of a different sort – calm brackish water framed by wetland plants and beach rose in which redwing blackbirds, ducks, geese and wading birds shelter and feed.

An important Swampscott aquatic resource is the bed of eelgrass (*Zostera marina*) at Fisherman's Beach. Eelgrass is a productive near shore marine habitat that supports diverse floral and faunal species, absorbs nutrients, stabilizes sediments, and provides habitat and detrital biomass for a diversity of life. In a study taking samples in Nahant, Gloucester, and Boston, 34 different species of fish were found to use eelgrass as either refuge, nursery, spawning or foraging habitat. Species identified in the study ranged from tiny fish, such as sticklebacks and bay pipefish up to apex predators like sand tiger sharks and striped bass. A local Swampscott example of a species that relies on eelgrass is the black brant (*Branta bernicla*), a small goose, whose diet largely consists of eelgrass.

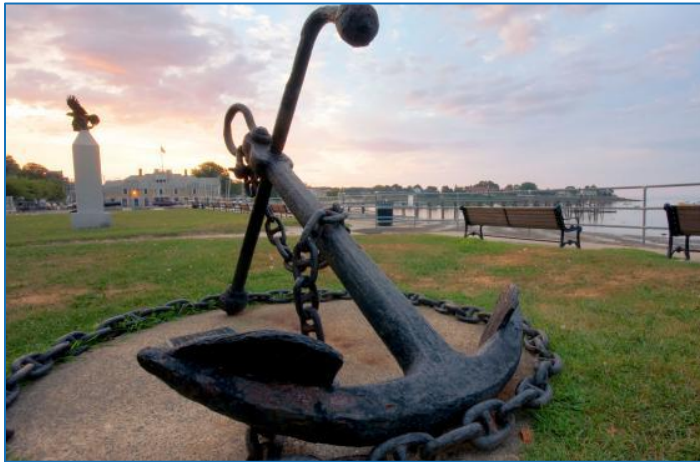


A flock of up to 40 brant spend a portion of the winter at Fisherman's Beach dining on eelgrass. Sea lettuce and other marine vegetation is also found in shallows at other town beaches.

A Conservation Commission has been created in Swampscott to protect the vital coastal ecosystems surrounding the Harbor, particularly wetland areas. Wetlands are further described in Appendix C.

As previously noted, water quality has historically been affected by CSOs associated with storm water and sewers in Swampscott and Lynn. The discharge to King's Beach has been eliminated. This is further discussed in Section 3 of this report.

2.4.3 Artistic and Historic Resources



Early historical accounts of Swampscott report that people of the Naumkeag, a sub-group of the Pawtucket Tribe of Native Americans, settled in the area, referred to the area as "land of the red rock," in the seventeenth century to fish and hunt.

Two important Native American trails pass through town: Essex Street (called Marblehead Lane during the Colonial period) which was functionally a highway in 1673, and Humphrey Street, which extended along the shore to Marblehead and Salem. The latter was extensively used

by both Native Americans and Colonial settlers, and on July 5, 1659 was officially designated as a public highway, possibly the first in the Colonies. The first English settlers were William Witter, Samuel Smith, and Francis Ingalls, who in 1629, had received permission from Governor Endicott to settle where they wished but without grant or title of land. The original settlement of Swampscott lay within a radius of a few hundred yards from Lady Moody's beach, now King's Beach, at Monument Square and adjacent to the traditional site of Poquanum's hut or dwelling on Black Will's Cliff. Thus, for more than 300 years this area has been the historic and civic center of the town.

Originally part of the large Saugus land grant and later the eastern part of Lynn's Ward One, Swampscott was settled and established in 1629 when Francis Ingalls came and built the first Massachusetts Bay Colony tannery on Humphrey's Brook. Swampscott was originally a district of Lynn. When the Town of Swampscott was incorporated (May 21, 1852), the Humphrey Grant was increased by 653 acres, taken from the City of Lynn. Swampscott separated from Lynn when a group of 97 petitioners told the General Court of the Commonwealth of Massachusetts that:

1. They are situated somewhat remote from the central portion of Lynn; and
2. That their business is different from that of the principal part of Lynn; and
3. That their convenience and interests would be promoted by a separate government, especially after the citizens of Lynn opted to switch from a town to a city form of government.

Lynn offered no substantial opposition, so the legislature passed an enabling act which authorized the organization of a separate town government under the date of May 21, 1852. On October 9, 1852 Lynn was paid \$5,450.00 for the land it lost to the new community now known as the Town of Swampscott.

In 1857, a small strip of land known as the “Salem Finger”, of approximately 68 acres in size, was taken by an act of the General Court from the City of Salem and added to Swampscott at the northern boundary. This brought the total area of the town to the present 3.05 square miles, equivalent to 1,951 acres.¹

Swampscott remained a quiet village for several years following incorporation. Fishing was the major economic engine with dories and “jiggers” as the main fishing fleet until the turn of the 19th century when schooners were first used. In the late 1700s, Ebenezer Phillips learned the dry fish process from the Naumkeag’s and set up a processing facility for cod whereby the cod was dried, put in barrels and shipped all over the world. Phillips’ business was a success and he became one of this country’s first millionaires.

Fishing for lobster in the waters off of Swampscott began in 1808, and Swampscott reached worldwide status as the place where Ebenezer Thorndike invented the lobster pot (in 1808) and revolutionized lobster harvesting. Additionally, the Swampscott Dory, a fishing boat still in use throughout the world today, was invented in 1840 by Theophilus Brackett to row and to pull lobster pots. The dory was considered the best seaworthy boat for fishermen due to its unique flat-bottomed design.

By 1826 the Swampscott fleet had six Chebacco boats (27-40 tons), which were used to fish for cod, haddock, pollock, hake and mackerel. Long known as a seafaring fishing village, Swampscott hosted a large commercial fishing fleet which sailed daily from our protected bay. Early accounts of Swampscott considered it a “community of modest means” and indicated that one man in three was a fisherman. By 1855 there were 39 schooners. Shoe manufacturing was a close second to the fishing economy followed by agriculture with 29 farms by 1865. Other modest mid-19th century manufacturing included the production of tin ware, boatbuilding, basket making and three house building firms. Cod and mackerel were the principle catches of the day. Boatbuilding was an important part of Swampscott life, and the Swampscott dory, now enshrined on the Town Seal, has been the fisherman’s friend ever since.



¹ Swampscott Open Space and Recreation Master Plan, 1983



Alongside Swampscott's fishing heritage came the advent of large hotels and homes as the community attracted summer residents from every corner of the world. There were also homes of specific historical significance. For example, John Humphrey, the first deputy governor of the Massachusetts Bay Colony, lived in an attractive saltbox home in 1637, which is now home to the Swampscott Historical Society at 99 Paradise Road and is now listed on the National Register of Historic Places.

The advent of rail service in the mid-1800's, both by steam locomotive and streetcar, was a pivotal event in the transformation of Swampscott from quaint fishing village to elite summer resort. The Swampscott Depot, constructed in 1872, is the last surviving train depot in town. It is a remnant of the Eastern Railroad, one of the nation's earliest rail lines. In 1838, the Eastern introduced steam rail transportation between Swampscott and Boston.

The expansion of the railroad and the trolley car system triggered an unparalleled building boom along the shoreline, "from Fishing Point in Swampscott to Peach's Point in Marblehead."² Savvy landowners petitioned the railroad to extend the line from Swampscott's main depot to remote beachfront areas, investing huge sums to construct small train depots that would cater to the wealthy vacationers. Easy access by train or trolley made Swampscott even more desirable as a resort.

Stately homes which evolved in Swampscott include Professor Elihu Thomson's Georgian revival mansion with its unique and ornate interior carvings. Professor Thomson was an electrical engineer and inventor, and founded the Thomson-Houston Electric Company, which in 1892 merged with the Edison General Electric Company (founded by Thomas Edison), and became the General Electric Company. The building, designed by James T. Kelley, now serves as the Town Administration Building and is also listed on the National Historic Register. Andrew Preston, founder of the United Fruit Company, had one of the major summer estates in Swampscott. The Preston estate covered over 100 acres and included its own golf course. Architect Arthur Little built several of the first shingle-styled homes in Swampscott, all expansive summer homes with ocean views and most with ballrooms.

The hotel and boarding house business flourished to serve the influx of summer visitors with the Ocean House, the Hotel Preston, the Lincoln House Hotel, the Hotel Bellevue, and the New Ocean House Hotel. Notable summer guests, including President and Mrs. Calvin Coolidge, and Woolworth heiress Ethel Donahue frequented our lavish accommodations.

² "Swampscott, Massachusetts: Celebrating 150 Years 1852-2002"

None of the large hotels remain standing today, most having been destroyed by fire or savage coastal storms, and most of the large estates have been subdivided into single family homes.

By the late 19th century, Swampscott's renown as a seaside resort town was widely recognized and the town became an increasingly attractive area for building. The grand resort hotels for which the town became known were built. A few large resorts were built in the 1800's which attracted wealthy patrons, families, and businessmen from across the country. Many stayed and built grand homes in the area which played a vital role in the town's diverse history. These included the Taft, once located on Galloupes Point; the Hotel Preston, at the Marblehead line on Phillips Beach; the Lincoln House, on Lincoln House Point; the Hotel Bellevue, near Bellevue Road; and the Ocean House and its successor, the sprawling New Ocean House, on Whale's Beach.

The eastern portion of the Swampscott shoreline was subdivided to form seaside estates where wealthy members of Boston society would spend their summers. From the 1870's to the end of the 1920's, the "summer people" were a mainstay of the local economy, and many townspeople worked on the estates. Among the houses built in this era were many key examples of what Vincent Scully called the Shingle Style, a romanticized revival of early American architecture perfectly suited to summer life along the sea. Atlantic Avenue came into being in this period as an elegant carriage drive from Swampscott to Marblehead.³



The end of the 19th century saw the town becoming a commuter suburb. With good rail service to Boston and booming industry in Lynn, Swampscott became a favored year-round residential community. The Humphrey Street area continued to be the center of business activity, with a downtown and civic hub that extended along Burrill Street to the train station. As the 20th century advanced and economic fortunes changed, most of the old summer estates were demolished, and the land redeveloped as year-round residential neighborhoods. A small number of great houses from this era remain to this day.

One of Swampscott's greatest legacies from the late 19th century is Monument Avenue and the surrounding residential area, designed by Frederick Law Olmsted, the renowned landscape architect. The Olmsted Historic District⁴ was developed on the former estate of Enoch Redington Mudge. It was later enhanced by the addition of the Town Hall (formerly the Elihu Thomson House) with its broad lawn and Linscott Park, which flank Monument Avenue. This graceful gateway into the town serves as an excellent example of the virtues of thoughtful environmental planning.

³ "The Shingle Style and the Stick Style (revised edition)" pp104-105, "The Era of the Summer Estates" and "The North Shore" chapter two

⁴ Listed on the National Register of Historic Places

In the mid-20th century, further inland areas of town were developed as residential subdivisions, and an automobile-era commercial zone developed along Paradise Road near the Salem town line. One large area of open space became the Tedesco Country Club and golf course. As the summer hotels along the coast burned or were demolished, they were replaced by further residential development, and Swampscott assumed the character it retains today.

Train service to Marblehead was discontinued in 1959, and the two small depots serving this line, Phillips Beach Depot and Beach Bluff Station, were demolished in 1962 and 1960, respectively. The right-of-way for the branch line remains as a utility corridor by National Grid, crossing Swampscott from the still-operative MBTA line in the western side of the town to the Marblehead border. Though inactive, the right-of-way remains a landscape feature in the town, with the potential to become a greenbelt and non-automotive access path through the middle of town.

The Fisherman's Beach area remains a primary focus of maritime activities. It is primarily used by recreational boaters, but a number of fishermen and lobstermen work out of the historic Fish House. Swampscott's fishing heritage is well known among residents. This heritage includes the development of the first lobster pot in 1808, the design in 1840 of the Swampscott Dory fishing boat, and the Swampscott Fish House, built by the Town in 1896 - it is the only municipal facility of its kind in the U.S.



Swampscott is a part of the Essex National Heritage Area, a federally designated heritage region comprised of 34 historically and naturally rich communities in northeastern Massachusetts. It contains natural and historic resources that have received national or regional designations or protections. Swampscott is one of 13 communities contributing to the 85-mile Essex County Scenic Byway, which connects these resources with a cohesive route. It traces historic settlement patterns and provides

Interesting Historical Facts About Swampscott:

1. Swampscott was originally part of Saugus and then Lynn, only becoming a separate incorporated entity in 1852.
2. The renowned landscape architect Frederick Law Olmsted designed one of the earliest parks in the U.S. in the Monument District in Swampscott (now known as the Olmsted Historic District).
3. Elihu Thomson, the founder of the Thomson-Houston Electric Company which later became the General Electric Company, was a Swampscott native.
4. Professor Thomson was an inventor and a flight enthusiast, and in the late 1890's, along with other inventors of the era, used to test fly early aircraft designs off of the beach in Swampscott (flown from the beach in order to provide "soft" landing in the ocean in case of failure).
5. President and Mrs. Calvin Coolidge used to summer in Swampscott at the sprawling resort known as the New Ocean House.
6. The Swampscott Dory, the now famous sailing fishing boat was invented by Theophilus Brackett in 1840 in Swampscott.
7. The lobster trap (which revolutionized lobster fishing) was invented by Swampscott resident Ebenezer Thorndike in 1808.

access to the defining historic and natural features. The Byway's resources attract visitors from outside the region, creating an opportunity to use the byway program to reinforce and grow heritage tourism and recreation-based businesses. Some of the cultural and historical areas that highlights the Town's rich history related to the waterfront are described in the following sections.

2.4.4 The Fish House

Evidence of the town's historic marine-based industry, the Fish House was built by the Town in 1896 and is the oldest, active municipal facility of its kind in the U.S. From its pier and adjacent Fisherman's Beach, one can enjoy dramatic views of the Boston skyline, Egg Rock, Massachusetts Bay, and the Nahant peninsula and causeway.

The Fish House is listed in the National Register of Historic Places. The Swampscott Fish House was built to offer fisherman leasable units in a single building, which replaced the numerous small fishing shanties previously dotting the Swampscott coastline. The Fish House is located at 391 Humphrey Street, where Humphrey Street and Puritan Road converge, and the Town Pier extends toward the water from the Fish House. The large, rectangular shingle-style building with Colonial Revival features, designed by Henry W. Rogers, is a two-story block under a hipped roof. A central pavilion under a hipped roof with wood balustrade forming a look-out rises above the two ends of the building. Large wall dormers dominate the end elevations and several steeply sloping shed roof dormers enliven the side elevations. Windows and doors have lattice sash. Present restoration efforts for this historic building are focused on repairing all areas damaged by the last several severe storm events, installing a new roof and fixing the "widows walk", repairing plumbing and wiring issues, and repairing water damage to the interior and exterior of the building.



FISHERMENS' BEACH, SWAMPSCOTT, MASS.



Swampscott Fish House (circa 1950) on Fisherman's Beach.

Today, the building is still used by fishermen, making it the only municipal fish house in continuous operation on the East Coast. It is also home to the Swampscott Yacht Club and the office of the Town's Harbormaster.

On February 17, 1933, Frederick W. Cook, Secretary of the Commonwealth of Massachusetts, issued the certification of incorporation for the official commencement of the Swampscott Yacht Club to Richard B. MacFarland and 69 other names ending with Sidney T. Doane. The Club was founded with the

purpose of promoting yachting and socializing, and particularly for encouraging and engaging in athletic exercises and yachting, with an established and maintained place for holding meetings.

The Forward to the Club's original by-laws stated its Principal Purpose: "It is intended to give every encouragement to boys who are interested in the handling of sailing craft, and in order to make it easy for them to become members of the Club, their dues have been set at \$2.00 annually, without requirement of any entrance fee. They remain junior members until they are 17 years old, when they automatically become Senior Members even though the Membership List is full at that time." Dues that first year were \$5.00 with a \$2.00 initiation fee (David W. Brewin).

The Yacht Club still operates as a private group with facilities and services at the Harbor for its members, including events, restrooms and showers, and meeting space in the Fish House. A yearly Polar Plunge charity event is conducted by the Club each January and has raised over \$100,000 for local charities since it began.

The Swampscott Fish house has recently (in 2018) received a large grant to affect the repairs noted above. The HWAC and the Town will determine how the grant funds will be disbursed.

2.4.5 The Town Pier

The Town Pier was built by the Town in 1896. In 1961, the pier was named Williams Town Pier in honor of Tech. Sgt. Albert J. Williams, killed during WWII.

The Pier extends from the Fish House to docks in the water, currently the mooring place of approximately 200 vessels. The Town Pier has floats on the seaward end that are used to load and unload passengers and supplies to boats and is an access point to the water and beaches for both recreational and commercial use.



2.4.6 Humphrey Street Commercial Corridor

The Humphrey Street Commercial Corridor is considered the town center and follows the ancient coastal pathway toward Marblehead. From the mid to late 19th century into the early 20th century, boarding houses and hotels built to accommodate summer residents lined this street. Henry Wadsworth Longfellow reportedly wrote his poem "The Cliff" from The Cliff House, which at one time stood along Humphrey Street overlooking the water. Beginning at Monument Avenue, this corridor is the setting for key public buildings and monuments including the Civil War Memorial, Town Hall, the Hadley School, St. John's Church, Chaisson Park and the Fish House, as well as downtown retail and office buildings. It provides broad vistas of Nahant Bay at King's Beach and Fisherman's Beach, and the views to the bay framed between the ocean-side buildings enhance the town's connection to the sea.

2.4.7 White Court (former Marian Court College)

A few houses from Swampscott's summer estate era still exist in town. Marian Court, one such estate located on six acres of oceanfront property, was converted into a college. The original mansion, constructed in 1895, served as the summer White House for President Calvin Coolidge in 1925. Specimen trees are found on the rolling lawn that affords striking views to the rocky coastline. The Marion Court College estate was recently redeveloped into a three-building condominium complex called White Court.

The adjacent property, Blythswood, is the only summer estate in Swampscott that remains essentially intact and in its original use as a residence. A 2011 conservation agreement between the owner and the Town provides for public access to the shoreline and views, and planning is under way to develop a public use plan. Together the properties provide a picture of the early 20th century landscape of the estate area along the rock-bound coast.

2.4.8 Monument Mall and Town Hall Lawn

Monument Mall, designed by Frederick Law Olmsted as the centerpiece of what is now called the Olmsted Historic District, creates a dramatic entrance parkway to the heart of Swampscott. The formal green planted median of Monument Avenue is quintessential Olmsted – gracefully curved lines in the street layouts, generous spaces, and the absence of sharp corners. Sited here are memorials reminding visitors of the contributions the town has made over the centuries to the nation’s armed conflicts. Flanking the Mall on one side is the Town Administration Building, located in the historic Elihu Thomson House, a Georgian Revival structure built in 1899. On the other side is Linscott Park, former site of the Chick Estate. Views out onto Nahant Bay are particularly enjoyable from the gazebo.

2.4.9 Olmsted Historic District

On the National Register of Historic Places, the Olmsted Historic District is a well-preserved residential area designed in 1888 by Frederick Law Olmsted, revered as the father of American landscape architecture. The subdivision was largely complete by 1917, a neighborhood of picturesque roadways winding through rolling hills set off by beautiful plantings. Throughout the intervening years, the neighborhood has remained strikingly true to Olmsted’s vision of “happy tranquility.”

2.4.10 Swampscott Railroad Depot

The advent of rail service between Boston and Swampscott in 1838 was a pivotal event in the transformation of Swampscott from quaint fishing village to elite summer resort. The Swampscott Depot, constructed in 1872, is the last surviving depot in town. It is listed on the National Register of Historic Places and is a priority site for preservation and restoration.





3. COASTAL RESILIENCY AND COASTAL PROTECTION

3.1 Climate Change and Sea Level Rise

Climate change is manifesting itself in many ways, affecting both inland and coastal resources. Swampscott should expect to experience an increase in ambient temperatures, more severe coastal and frontal storms, additional sea level rise, more severe coastal flooding, and increased damage to man-made and natural coastal resources. Although seasonal extremes in temperature in Swampscott are buffered by the town's coastal location, Swampscott's normal temperature ranges for January at 20-35 °F, and the normal temperatures in July are 63-85 °F. According to the U.S. Environmental Protection Agency ("EPA") report on climate change impacts (the *National Climate Assessment*, Nov. 23, 2018), the Northeast has experienced noticeable changes in its average weather over the last several decades, such as increased ambient temperatures, changes in seasonal weather, and increased frequency of extreme weather events. The weather is changing as a result of our changing climate. For example, since 1970, the average annual temperature in the Northeast has risen by > 2 °F and the average winter temperature increased by > 4 °F. These long-term weather conditions are changing due to regional (and global) climate change.

Over the past decade, Swampscott has taken steps to reduce its energy and environmental footprint to meet the challenges of climate change. In December 2010, the Massachusetts Department of Energy Resources designated Swampscott as a "Green Community." This designation indicates that Swampscott has made a commitment to reducing our fossil fuel dependence and negative impact on the environment. A requirement for achieving this designation was the development of a five-year energy reduction plan where the town would achieve a 20% reduction in energy use using 2009 as the baseline. This energy reduction plan was approved by Town Meeting and as of the end of fiscal year 2012, the town is approximately halfway towards achieving this 20% reduction. The reduction goal impacts energy use at all municipal and school properties. Swampscott also commissioned a report from Kleinfelder entitled "Coastal Climate Change Study" (Kleinfelder, 2016) to identify climate change impacts on coastal flooding, vulnerability of municipal infrastructure to flooding, and to highlight potential adaptation strategies including engineering, regulatory, and policy solutions.

3.2 Storm Resiliency

Flooding issues from both coastal and inland stormwater runoff is not a localized issue. Experienced across the region, and the world as a whole, flooding and the drainage required to mediate it must be planned out thoroughly. Open spaces and recreational areas can play a part in supporting the drainage system, but this may be done hand-in-hand. Any drainage work in Swampscott should also be developed to minimize negative drainage impacts on these open space areas. The Town has in the past performed dredging of the harbor to provide better boat access. The harbor however is home to large areas of eelgrass which act as a wildlife habitat. There is currently a planning effort underway to map out the next dredging of the harbor. Protection of the eelgrass and this habitat will be important, requiring the balancing of the boat access need along with the open space and habitat need.



Swampscott's waterfront represents the Town's most endearing, iconic, and historic asset. Swampscott is a Coastal Community. Many of its residents live in Swampscott because of the amenities that being on the coast affords. Swampscott is a destination for visitors because of its beautiful setting and its waterfront location.



Figure 3-1. Fisherman's Beach and Lower Uptown Business Districts of Swampscott. (Source: Google Earth Enhanced Imaging, 2018).

But the very thing that makes Swampscott such a great place to live and a wonderful destination to visit also represents the greatest threat to the Town, its waterfront, its business district and the livelihood of the Town itself. Coastal storm and ocean inundation is increasing at a rapid pace. Historically, super-storms or hurricanes occurred about once every decade or two (e.g., hurricanes effecting the north coast of Massachusetts occurred in 1938, 1944, 1954, 1960, 1985, 1991). Today, super-storm events are occurring at a rate of approximately two major storms per year, with significant damage storms occurring

at a frequency of three to four times per year. The accumulated damage from these storms is extensive. The coastal erosion, wave, and water damage threaten the waterfront all along the coast in Swampscott. Nowhere is this issue more evident than along the Fisherman's Beach and lower uptown portions of the Town. Here, successive storms over the last decade have severely damaged infrastructure, including the historic and iconic Fisherman's Beach Fish House, the Town Pier, and the lower downtown areas of the Swampscott business district (Figure 3-1). Along this stretch of the Town, the land topography is low and coastal storm energy is translated onto the built environment even during weak-moderate storm events; and during extreme events, the area succumbs to damage that is both dramatic and costly.

Impacts of storms on Swampscott's Harbor and water-sheet are even greater. The main Town Pier and the vessel moored in Swampscott's Harbor receive direct hits from storms that have east and southeasterly wind patterns. Swampscott has an active harbor that is home to both commercial fishing and recreational vessels. The Harbor in its current configuration is at maximum capacity for moored vessels, with a growing waitlist of additional and larger vessels that desire moorage. The Harbor is extremely vulnerable during these events, and when they occur when vessels are in the water (between March and November), the results can be devastating. Extensive property damage to the Swampscott fleet has occurred due to storm damage during storms having south and southeast fetch because of the lack of protection in the Harbor from such storms.



Figure 3-2. Aftermath of August 2011 Storm. (Source: Swampscott Reporter).

3.3 Damage to Swampscott's Coastline and Near Coastal Areas is a Major Issue.

Based on historical and recent trends, as well as models and an overwhelming amount of temporal data, the scientific and engineering communities of the world have come to the conclusion that one of the leading issues that societies will face over the coming decades is that of Climate Change induced weather events. Projections indicate that as much of 90% of coastal areas, representing over 15% of the earth's surface, is at risk from serious coastal damage. And the damage is not constricted to the immediate coastlines. Many coastal areas lie adjacent to low upland areas that are tied to the coastline and equally vulnerable to damage.

The sub-sections below describe the nature of the vulnerability issue along the Swampscott coastline and discuss potential resiliency solutions that could be employed. This Harbor and Waterfront Plan (2018) strongly supports the initiation of a series of coastal resiliency interventions along the Swampscott waterfront aimed at greatly reducing and/or ameliorating the impacts of the increasing frequency and severity of storms.

Over the past two decades, the coastal areas in Swampscott have endured 4 Major Hurricanes and over 2 dozen significant storm events that have caused between moderate (> \$ 250,000) to severe (> \$ 1,000,000) property damage. In addition to property damage, the Town has suffered loss of life from several of the severe storms (see Appendix D article). Storm damage has accrued to an estimated \$42,000,000 since 1980 (see Analysis, Appendix E). And, like the federal and state estimates for damage, those statistics only take into account existing property and infrastructure damage, and does not take into account the secondary impacts (such as to historic structures, beach and waterfront amenities, tourism, business activity, and ecological and environmental resources). Estimates of additional non-direct costs such as these can add as much as another \$20,000,000 to \$40,000,000 to the cost of storm damage in the Town. With total physical, business, and environmental impacts in the \$60M - \$ 80M range for the 25-years past, and projected increase to be on an accelerated path, it is likely that the next several decades will experience an even higher cost. The Massachusetts Coastal Zone Management (MCZM) authority has compiled a map of the inundation levels within the Swampscott downtown area which shows that expected inundation areas from modelled Category 1-4 hurricanes.

In the worst-case scenario modelled, the flooded area (red in the map in Figure 3 below) would reach from the immediate coastline as far back as the MBTA rail station.

Damage Experienced to Date. Much of the cost of damage has been experienced to date along the lower coastal areas, such as locations at Fisherman's Beach, the Town Pier, the Harbor, and the lower uptown business district adjoining these areas. Examples of the damage and destruction that the highly vulnerable Fisherman's area have are included below (Figures 3-4 through 3-9).

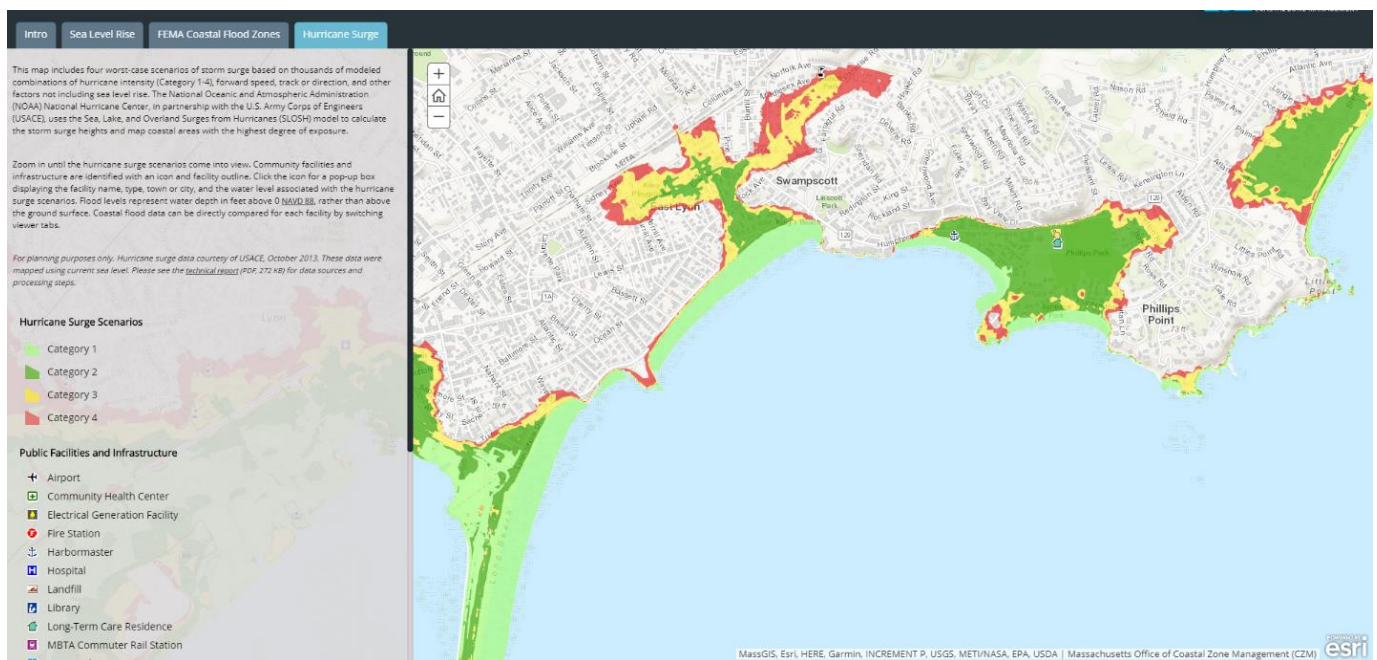


Image credit: Massachusetts Coastal Zone Management (CZM) and the National Oceanic and Atmospheric Association (NOAA), 2017.

Figure 3-3. Modelled scenario of sea level inundation within the Town of Swampscott for Category 1, 2, 3 and 4 storms.



April Storm Damage, 2007



April Storm Damage, 2007



August 2011 Storm



2011 – Hurricane Irene



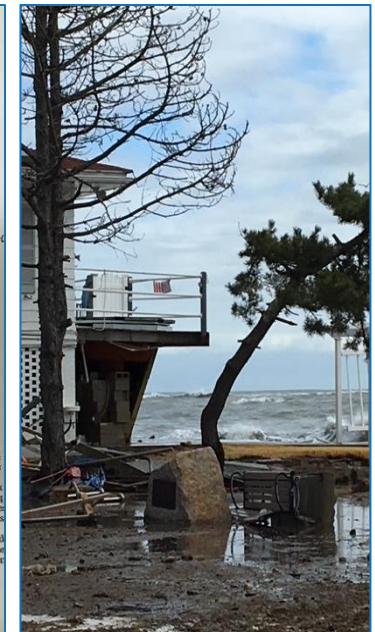
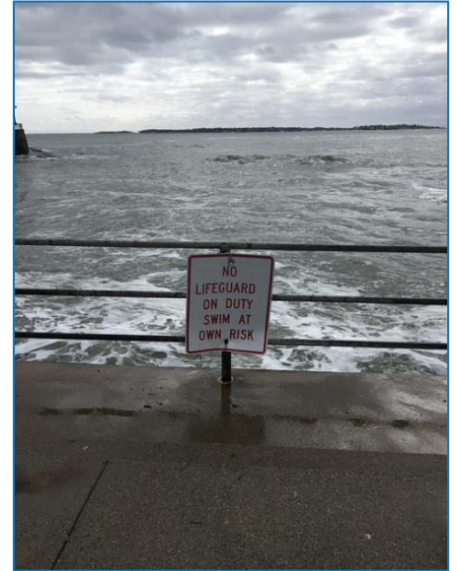
Super Storm Sandy, October 2012



Blizzard, February 2013

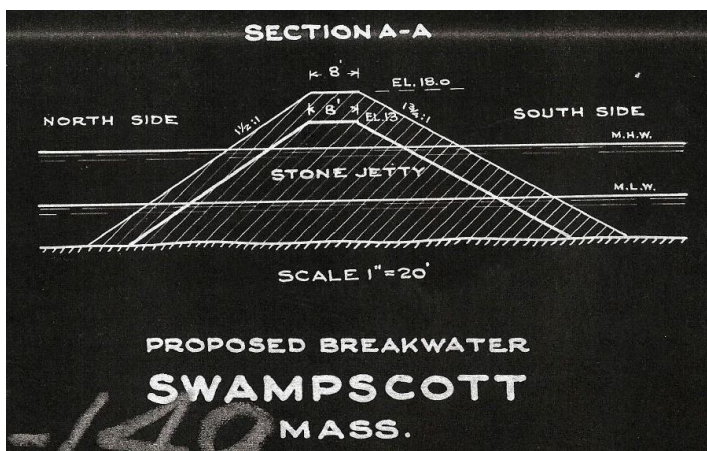
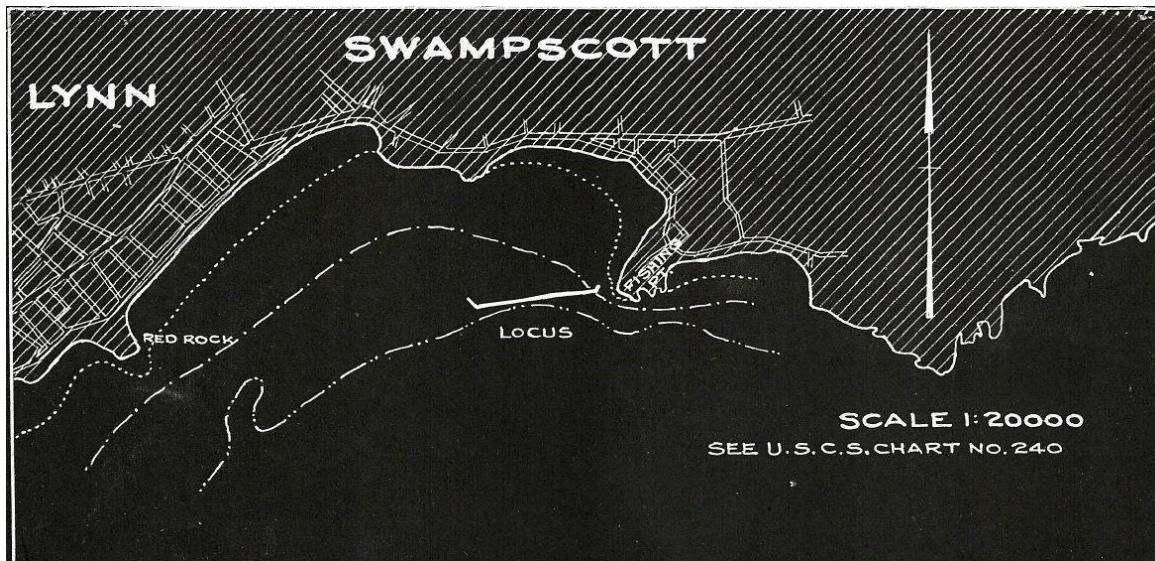


March 2018 Storm

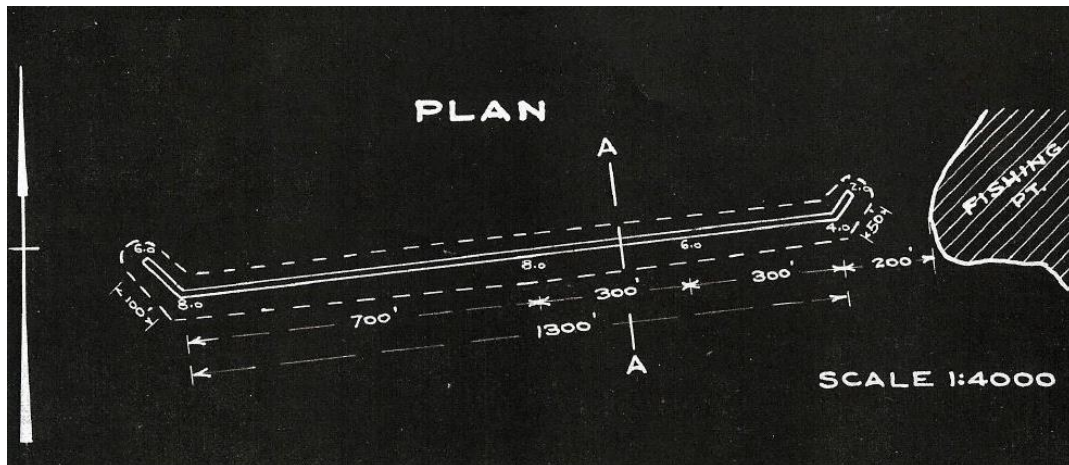


3.4 Resiliency Measures Supported by the Plan.

In order to ameliorate the impacts of such storm events on the coastline, the Harbor and Waterfront Plan supports intervention in the form of resilient structural enhancement of coastal infrastructure. One of the signature elements of a more resilient waterfront in the Harbor and central uptown area is the development of a "Protective Living Reef (PLR)" breakwater system to protect both the water-sheet assets (vessels, piers, and beach amenities) and the coastal assets (beach, roadways, utilities, businesses, and residences) along the Fisherman's Beach area. Elements of a Protective Living Reef coastal resiliency solution to the wave and storm energy issues seen historically along the Fisherman's Beach (see Army Corps of Engineers proposed breakwater from 1924 in Figures 3-10 through 3-12 below).



Figures 3-10, 3-11, and 3-12. Original design sketches from the U.S. Army Corps of Engineers 1924 design for a Breakwater at the mouth of Swampscott Harbor. Federal Government funding was pulled from the project to support other Federal Government priorities, and the structure was never built.



In keeping with the theme established by the Army Corps of Engineers, and at the suggestion of personnel within the U.S. Environmental Protection Agency, the Plan supports the addition of similar infrastructure in Swampscott Harbor. The Plan supports the inclusion of a “Protective Living Reef” in Swampscott Harbor to protect the watershed and coastal assets in the area from storm energy and the types of resulting damage documented above.

3.4.1 Concept Plans for a “Protective Living Reef” in Swampscott Harbor

Concept Plans for a Protective Living Reef (PLR) breakwater structure for Swampscott Harbor have been developed along a separate track to the development of the Harbor and Waterfront Plan. An overview of the developed plans is included in the section below.

A Protective Living Reef breakwater differs from the standard type of breakwater originally proposed by the Army Corps by being designed in a manner that promotes the development of natural marine habitat along the breakwater (see Figure 3-13 below).

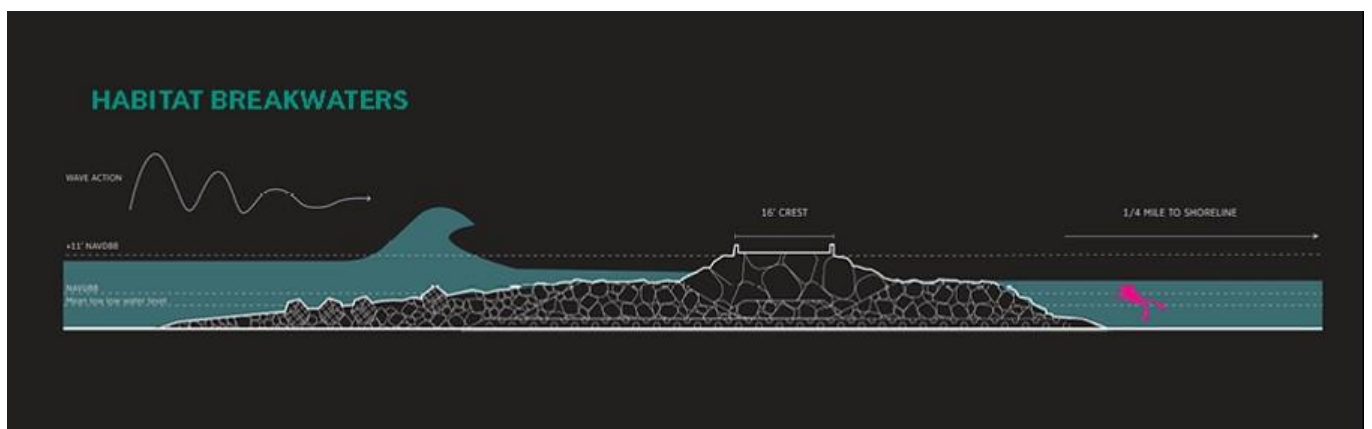


Figure 3-13. Conceptual design of a “Protective Living Reef” breakwater. The “reef” provides protection from damaging wave energy that creates much of the water-sheet and shoreline damage during severe storm events.

A Protective Living Reef Breakwater has many additional benefits; besides protecting the water-sheet and shoreline assets behind the structure, the structure itself becomes a magnet for sea life, and creates new habitat for existing species of marine organisms that are native to the area.



Figure 3-14. Flooding at the Fish House. Wave damage from storm surge like that pictured here would be greatly decreased or eliminated with a Living Reef protective structure.

As noted in the plan view below (see Figure 3-15), the concept of the Protective Living Reef for Swampscott Harbor also allows for additional amenities to be incorporated into the Harbor environment. Both built and natural systems and amenities can be added to improve the utility and ecological soundness of the Harbor.

Figure 3-15. The “Protective Living Reef” (concept pictured below) also provides protection for vessels and the portions of the coastline that are vulnerable.





4. OTHER IDENTIFIED ISSUES

4.1 Commercial Fishing Fleet

The commercial fishing fleet in Swampscott, which represents the Town's founding industry, today supports approximately 36 boats fishing for everything from lobsters to mackerel to sea bass.

Currently, the water depth in the harbor is not adequate for larger boats or commercial boats. Over the past decades, siltation and movement of sand into the harbor has reduced the depth of water in the harbor's mooring fields. This has, in turn, significantly reduced the ability of larger fishing vessels to moor year-round and enhances wave energy in the harbor, which increases the potential damage to moored vessels. Dredging the harbor will be difficult due to the abundant eelgrass population, which must be protected. However, there may be areas within the harbor where dredging would not impact eelgrass. The Town should evaluate if there are areas in the harbor can be dredged to accommodate larger boats, while ensuring the protection of eelgrass beds. Sand from any dredging operations can be used for beach nourishment in areas identified as needing additional protection. Finally, the installation of floats will be necessary for the expansion of larger boats.

4.2 Community and Economic Resources

Beach and coastal access connections to the rest of Swampscott's open space areas are consistently noted by residents as being important to the town. Improving the stewardship and access to existing natural resources, particularly to its beaches, is very important to the community.

4.3 Water Quality

Water quality along the coast of Swampscott is generally good and increases in quality the farther north along the coastline one travels. Along Kings Beach the water quality is decreased due to the presence of latent organics in the sediments from historic combined overflows (now separated) that discharged into the ocean from outfalls along the Lynn shore. Due to independent water circulation patterns, the water quality along Fisherman's beach is good, and as a result, healthy beds of eel grass have grown up in the shallow water along the northern portion of the harbor. The water quality along Eiseman's, Phillips, and Preston beaches is also relatively good, though during periods of heavy rainfall or snowmelt, storm-water outfalls from the highlands adjacent to the coastline discharge to the coastal waters and increase the sediment loading and biological and road contaminant influx into the water.

4.3.1 Sedimentation

Stormwater is a pollution concern as it carries heavy metals and other hazardous materials from roads into streams, and small water bodies in town and cause sedimentation. There is currently no data outlining the extent of sedimentation that has occurred from outfalls in town. As part of the work

associated with the Protective Living Reef Structure, modelling efforts were undertaken that predict the sedimentation cycle within the harbor at Fisherman's Beach.

4.3.2 Erosion

Swampscott has a fairly rocky coastline, which prevents significant erosion from occurring. The construction of sea walls along the coast have also assisted in reducing erosion.

4.3.3 Combined Sewer Overflows

CSOs are part of the municipal infrastructure of Swampscott and Lynn, with discharge points along the Harbor. After heavy rainfall or snowmelt, storm water and sewage may overload the system and flow into the Harbor. There is a combined sewer overflow that (until recently) discharged into Stacey Brook in Lynn. This culverted brook, in turn, ultimately discharged to King's Beach and Nahant Bay. The Lynn Water & Sewer Commission recently conducted sewer separation work which resulted in elimination of the outfall. There is also reported bacterial contamination from storm drains owned by the town that get into Stacey Brook and ultimately King's Beach.⁵

A report submitted in July 2012 by the Town's consultant, Kleinfelder,²³ notes that the town:

"owns and operates separate sewer, underdrain, and storm drain systems. It has been documented that the underdrain system is largely contaminated by the adjacent separate sewer system due to defects in both systems. In addition, portions of the drainage system which discharge into Stacey's Brook and ultimately King's Beach, are contaminated by the separate sewer system. The Town operates a chlorination station to disinfect the stormwater prior to discharge onto King's Beach."

According to the report, the most recent investigation work, completed in the spring of 2012, has identified several specific contamination sources to the drain in two locations: Essex Avenue and Banks Road areas. The report includes a conceptual design approach for mitigating the identified stormwater contamination sources from these areas, noting, however, that successful mitigating of contamination sources identified in these areas may not eliminate all sources of contamination. Further evaluation of water quality will be required after implementation of the proposed mitigation measures.⁶

⁵ The Town of Swampscott's storm sewers discharges are covered by a federal "general" permit (that is, a permit that covers more than one community). Specifically, on May 1, 2003, the U.S.EPA issued a Final General Permit for Stormwater Discharges From Small Municipal Separate Storm Sewer Systems ("MS4 General Permit"). Under the permit each regulated community is required to develop and implement a stormwater management program (called a SWMP) to reduce the contamination of stormwater runoff and prohibit illicit discharges. While that permit expired, it continues in effect pending reissuance of a new permit (a process which is pending).

⁶ Work pertaining to the town's sewer and storm drains is being done under several consent orders agreed to by the Town and Commonwealth: January 25, 2007 Administrative Consent Order (ACOP-NE-07-1N001); June 26, 2008 Administrative Consent Order (ACOP-NE-08-1N005); January 24, 2012 Administrative Consent Order (ACOP-NE-12-1N001); and June 7, 2012 Notice of Noncompliance.

The DPW samples drainage outfalls at King's Beach three times a week from May 1 to September 30 for fecal coliform. Results are submitted to DEP as part of the 2008 Consent Order.⁷ These samples are representative of the water quality in Stacey's Brook and the associated drainage area.

In addition, an annual report Swampscott submitted for the reporting period April 1, 2011 to March 31, 2012, notes that the Board of Health samples waters from local beaches during the summer. During the April 1, 2011 to March 31, 2012 period, "the following Swampscott beaches were closed: Eiseman's Beach once; Fisherman's Beach one time; King's Beach three times; Phillips Beach once; Preston Beach twice. Nearly all closures followed significant rain events."

4.4 No Discharge Areas

Boat sewage can contain bacteria and viruses, nutrients, and chemicals that can be harmful to water quality and public health. No Discharge Areas (NDAs), are designated bodies of water where the discharge of all boat sewage, whether treated or not, is prohibited. The Massachusetts Office of Coastal Zone Management (CZM) works with coastal communities to develop applications to the U.S. EPA for no discharge status and supports efforts to increase boat pump out facilities to make proper sewage disposal more convenient for boaters. Swampscott (along with Nahant, Lynn, Saugus, and Revere) waters were designated an NDA on March 18, 2009. There are two pump out facilities available to service vessels in the area – one in Marblehead Harbor and one in Salem Harbor.⁸

⁷ See Administrative Consent Order (ACOP-NE-1N005), par. 20, dated June 26, 2008.

⁸ US EPA "No Discharge Areas"



5. THE TOWN'S VISION FOR THE HARBOR AND WATERFRONT

Based on the research conducted for this Harbor Plan, the Harbor and Waterfront Advisory Committee (HWAC) has developed the following Goals and Objectives for Swampscott waterfront for the benefit of all Swampscott residents. Each goal includes a number of actions that can be taken to help achieve the stated goal. Both the short-term and long-term goals will help achieve the Town's Vision for the Harbor. The general objectives are listed below:

- Provide and manage ocean access for water-related activity.
- Promote safe boating and encourage water-related activities.
- Efficient Harbor Management and Administration (incorporating Harbor Management best practices and description of what the Harbor Master's duties/jurisdiction should include).
- Monitor, maintain, and improve the natural environment.
- Encourage the increase of boat presence.
- Develop and improve amenities to promote use of the Harbor by all.
- Encourage integration of the coastline into the cultural, educational, and community activities.

5.1 Short-term Goals

Short-term goals for the harbor and waterfront include the following:

Short-term Goal 1: *Mitigate impacts to areas most vulnerable to flooding, increase boat presence, and protect boats in the harbor by installing two Protective Living Reefs off Fisherman's Beach.*

As discussed in the Master Plan, areas along Humphrey Street, both residential and commercial, are projected to be most vulnerable to flooding. The HWAC has proposed two Protective Living Reefs in the harbor off of Fisherman's Beach and Lincoln House Point to mitigate the impacts of flooding. The Protective Living Reefs will greatly reduce wave activity and storm surge in the bay. This is particularly important because the land between the ocean and Humphrey Street, from Fisherman's Beach east to Glenn Road, is the largest, by area, of the four areas of town that will be vulnerable to a 1% chance of flooding in 2070. This project is the lynchpin of the Harbor Plan; without proper protection of the Harbor, Swampscott's commercial fisherman will continue to leave the area and any improvements made to the pier, the Fish House, or other Fisherman's beach amenities would be highly vulnerable to storm surge.

and flooding. The Harbor and Waterfront Committee is planning to immediately pursue design funding after the adoption of this plan.

No modeling has yet looked at the specific impact that the Protective Living Reefs would have on flooding risk. However, based on the Kleinfelder Map, it appears that through 2030, the only entryway for water into most of that area is through Fisherman's Beach. The map shows that higher elevations of Puritan Road, from Lincoln House Point to Puritan Lane, block storm surge from New Ocean House and Eiseman's beaches. By protecting the Fisherman's Beach area, the risk of flooding in areas adjacent to the beach could be greatly minimized for years.

Depending on the timing of the Protective Living Reefs installation, it may be possible to obtain boulders from the proposed dredging activities in the Boston Harbor at a reduced cost.

Short-term Goal 2: *Promote the waterfront as a focal point for Swampscott's visitor economy, emphasizing cultural tourism, high quality recreational experiences and longer visitor stays.*

Promoting Swampscott's visitor economy is a short-term and long-term goal. In the short-term, the Harbor and Waterfront Plan provides for elements and enhancements to the coastline that will attract new visitors and additional business which will add to the potential users of the designated areas near the waterfront (such as those zoned to allow for restaurants, shops, and small hotels/bed and breakfast establishments).

Short-term Goal 3: *Improve accessibility for larger boats through harbor maintenance.*

Currently, the water depth in the harbor is not adequate for larger boats or commercial boats. Dredging the harbor will be difficult due to the abundant eelgrass population, which must be protected. However, there may be areas within the harbor where dredging would not impact eelgrass. The Town should evaluate if there are areas in the harbor can be dredged to accommodate larger boats. Additionally, the installation of floats will be necessary for the expansion of larger boats.

Short-term Goal 4: *Address the shortage of parking along the waterfront.*

The HWAC identified parking as an issue to be addressed in both the short-term and the long-term. Parking at the waterfront is limited and does not meet current or future demands. As the harbor and Humphrey Street become more and more integrated, the parking demand will increase. To accommodate residents and visitors, the Town should evaluate alternative parking options. The Town should also evaluate if implementing a shuttle or trolley route from existing town parking lots (e.g., Phillips Park and commuter rail station) to the waterfront would alleviate some of the parking issues.

5.2 Long-term Goals

The following long-term goals have been developed to be consistent with the Town's 2025 Vision.

Long-term Goal 1: *Consistent with Swampscott's maritime and seacoast resort history, strengthen the access to, and visibility of the harbor on the landside for residents and visitors alike.*

- Once the Protective Living Reefs are installed, develop a small marina to expand services for transient vessels, including yachts and commercial boats.

- Increase berthing and mooring capacity for private recreational and commercial vessels such as fishing and yacht charters, in a manner consistent with Massachusetts Office of Coastal Zone Management (MCZM) water quality policies.
- Enhance facilities for local fishermen.
- Develop landside and waterside public amenities to enhance the harbor experience.

Long-term Goal 2: *Maximize the economic potential of the harbor through economic development goals, while enhancing the quality of life for residents in adjacent areas.*

- Expand tax base and economic activities in general.
- Promote private commercial development (i.e. restaurants, bed and breakfast boutique hotels) that will take advantage of increased visitations, as a result of public investments in this area.
- Ensure the integrity of historic resources and quality of life in residential neighborhoods near areas with intensified harbor uses.
- Enhance the walkways along the waterfront with Streetscape.
- Modify sidewalks along Humphrey Street to accommodate outdoor dining options for existing and new restaurants.

Long-term Goal 3: *Promote the waterfront as a focal point for Swampscott's visitor economy, emphasizing cultural tourism, high quality recreational experiences and longer visitor stays.*

- Promote Swampscott as a vacation destination through a coordinated strategy employing a variety of means, including advertising.
- Use art as a focal point to attract new tourism through encouraging art installations, live theater, festivals, etc.
- Develop and promote a maritime distributed history museum or educational center with connections between waterfront historic sites/attractions, without compromising the integrity of these valuable resources.
- Promote improved pedestrian connections, and both view and access corridors that will draw people to the water's edge.
- Develop landside and waterside public amenities to enhance the year-round experience of the harbor and the Town as a whole for both visitors and residents.
- Develop amenities to sustain visitor interest and accommodate longer visitor stays. The development of bed and breakfast establishments will be vital to accommodating longer visitor stays.
- Develop and promote facilities and services that will define Swampscott as a full-service port for recreational boats and a welcoming waterfront for transient vessels.
- Encourage and support economic activities, which extend beyond the peak seasons.

Long-term Goal 4: *Protect and enhance access to the waterfront for the Swampscott community for passive and active recreation; reconnect the community to its waterfront where the connection does not currently exist.*

- Promote improved pedestrian connections, including the installation of a bicycle rack at the commuter station and at the harbor. Evaluate if adding a bicycle-share system, such as Hubway, would be viable for connecting the commuter station with the harbor.
- Improve access to the waterfront by providing trolley service from Town parking lots and the commuter rail station.
- Develop waterside public amenities to enhance the experience of the harbor. These amenities may include foot wash stations, showers, trash bins, concession stands/carts, and bathrooms.
- Maximize the potential public benefits to residential neighborhoods throughout the waterfront.
- Improve public access along the waterfront.
- Maximize amenities and opportunities for recreational boaters.

Long-term Goal 5: *Protect and preserve those aspects of Swampscott's waterfront experience which can beneficially link the Town to its maritime and seacoast resort past.*

- Support programs and projects which heighten public awareness of the historic maritime resources and the exceptional rich history of the waterfront as vital to Swampscott's identity and well-being.
- Enhance incentives for preservation of historic waterfront resources, such as the Fish House.

Long-term Goal 6: *Ensure that public investment in waterfront infrastructure will support and encourage private investment. Develop long-term capital maintenance/management strategies to ensure that public investment will result in infrastructure that is sustainable over the long-term.*

- Promote water-related commercial development by leveraging public investments in the area.
- Develop an access plan that maximizes the effective management of traffic associated with any proposed improvements and develops appropriate solutions to the parking demand that exists and will be created by any improvements associated with improved waterfront access.

Long-term Goal 7: *Protect and enhance the environmental quality of the harbor and its environs as an essential component of any proposed development or revitalization efforts.*

- Protect the Town's abundant eelgrass population. Specifically, a significant area of eelgrass off Fisherman's Beach offers habitat for juvenile fish and crustaceans.
- Support programs and projects which heighten public awareness of the harbor as an important and unique natural resource.
- Promote programs and projects which reinforce environmentally sound and appropriate use of the harbor, natural history trips, and environmental awareness outreach programs.
- Provide for adequate waste handling facilities, for trash, waste oil, marine pump-out, recycling, etc., in promoting increased waterside and landside use.
- Minimize the potential negative impacts of intensified harbor use and development on the harbor's natural resources.

- Explore opportunities for alternative production of energy (possibly solar and wind) that will have direct positive economic and/or ecologically impact on the harbor and the region.

To bring this vision to fruition, it is recommended that the Harbor and Waterfront Advisory Committee become a Commission. This will allow the HWAC to have control and input over the Harbor-related budget.

6. SPECIFIC PRESENT AND FUTURE PROJECTS

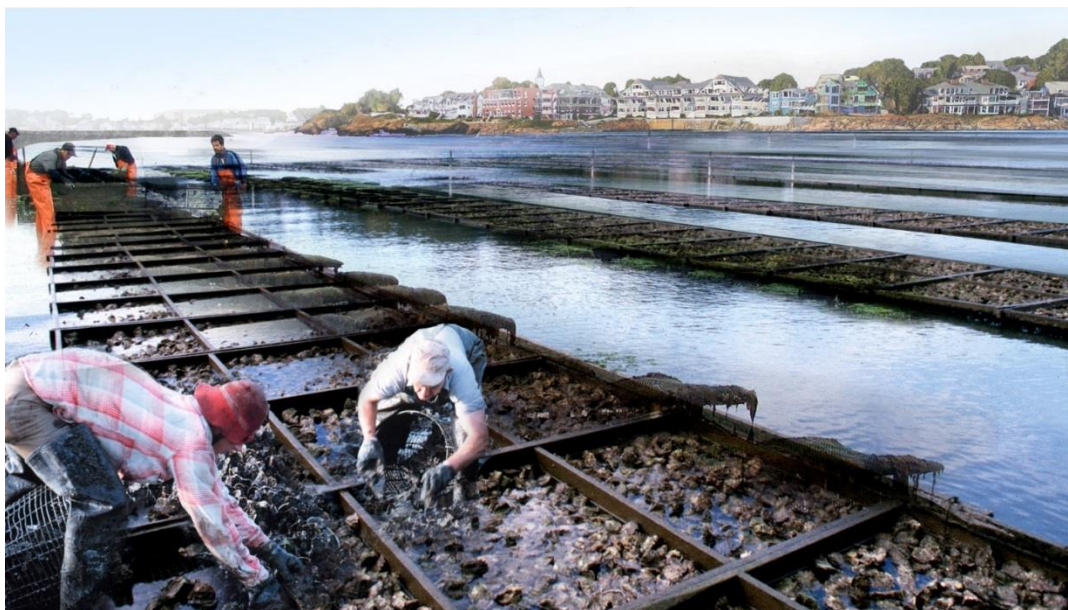
6.1 Swampscott Harbor and the Protective Living Reef

Installation of a “Protective Living Reef” (PLR) Structure around the outer harbor to protect the fishing fleet and boats moored in the harbor would both protect the harbor and upland adjacent to the harbor, but would also enable the development of the additional amenities noted in the sections above (see Section 3 above).

Marina, Transient Slips and Expanded Pier. Installation of the PLR would enable redevelopment of the pier area in the harbor, including the addition of finger piers and transient dockage. This would complement the other new amenities that could now be present once the harbor is better protected by waves and surf. The presence of transient slips would allow for additional amenities on the dock such as water and live-loading. Rental of transient slips during the summer months would provide income for the Town. This amenity would assist in making the Town a *destination* location for boaters.

Expanded Mooring Area. Additionally, the presence of a PLR would allow for an expansion of the mooring area within the Harbor at Fisherman’s Beach, allowing for the mooring of additional vessels and the inclusion of deeper draft (sailboats) for the first time in over a decade. It is estimated that the water-sheet area in which moorings could be placed could increase by 25%, allowing for the inclusion of an additional 30 vessels in the harbor.

Aquaculture. Another interesting by-product of the placement of a Protective Living Reef within the Harbor is the potential to add aquaculture activities to the Harbor at Fisherman’s Beach. In keeping with the fishing history of the Town, the ability to cultivate and harvest shellfish in the Harbor would greatly increase the ‘interest factor’ of the Town. “Swampscott Oysters” and “Swampscott Mussels” could be the newest form of gastronomic enterprise within the Town.





The Protective Living Reef (PLR) surrounding the outer regions of the Harbor both protect the coastline and allow for safer mooring and docking of vessels. The amenity not only provides a measure of shore protection, but also creates a situation that is conducive to the development of other waterfront upgrades and additions, such as a Snack Shack, bathhouse, and restrooms, the potential to have restaurants on the pier, and a connecting promenade that will become a focal point of the Town and its beautiful waterfront. These proposed designs also help fulfill sustainability and economic development goals from the 2025 Master Plan, which call for Swampscott to “Prepare for the impacts of sea level rise⁹” and “Improve physical and visual access to waterfront amenities¹⁰”.

6.2 Swampscott Promenade – The Seaside Boardwalk

The great waterfront communities of the world have enticing and exciting coastal facing walkways that provide both a communing point for the public, and also an amenity for the populace. The promenades

⁹ Swampscott 2025 The Master Plan, pg. 152.

¹⁰ Swampscott 2025 The Master Plan, pg. 60.

become a focal point where the community and tourists alike congregate to stroll, exercise, sight-see, relax, and investigate.

Dubbed the “Edgewater Promenade”, this lineal amenity fulfills the Plan goal of providing both an enticing public amenity as well as shore protection. The promenade picks up the coastal path that runs along the beach in Lynn where it ends at the Lynn-Swampscott line just north of Red Rock park.

The Swampscott Promenade Route:



As envisioned here, the Edgewater Promenade would continue to Fisherman’s Beach and end in front of the Fish House, creating a 4,000-foot long inviting pathway along the downtown beaches for the community and visitors alike to enjoy. It is estimated that this one amenity alone could bring more than \$10 million per year in annual additional revenue to the community. The promenade, as envisioned here (which is just one of many possible configurations) would also double as shoreline protection as an incorporated “toe wall” would increase the protected height of the breakwater headwall at the beach by approximately 2.5-feet, and the design – cantilevering out over the beach edge, would deflect wave energy during storm events.





The Promenade can include “bump-out” areas for snack stands, resting benches, or art and history installations as shown above and (in the rendering) below. The amenity as portrayed includes a stepped border area and raised bike path along its street-side edge with an outer curb adjacent to the parking spaces along the street to allow for safe bicycling. With a maritime pattern of either stamped and scored colored concrete or pavers, the promenade would reflect an individualistic and unique amenity that would rival some of the world’s great waterfront walkways such as the South Beach boardwalk in Miami, Florida and the Copacabana in Rio de Janeiro, Brazil.



The Copacabana Walkway along the beach in Rio de Janeiro.
(<https://commons.wikimedia.org/w/index.php?curid=23505937>).



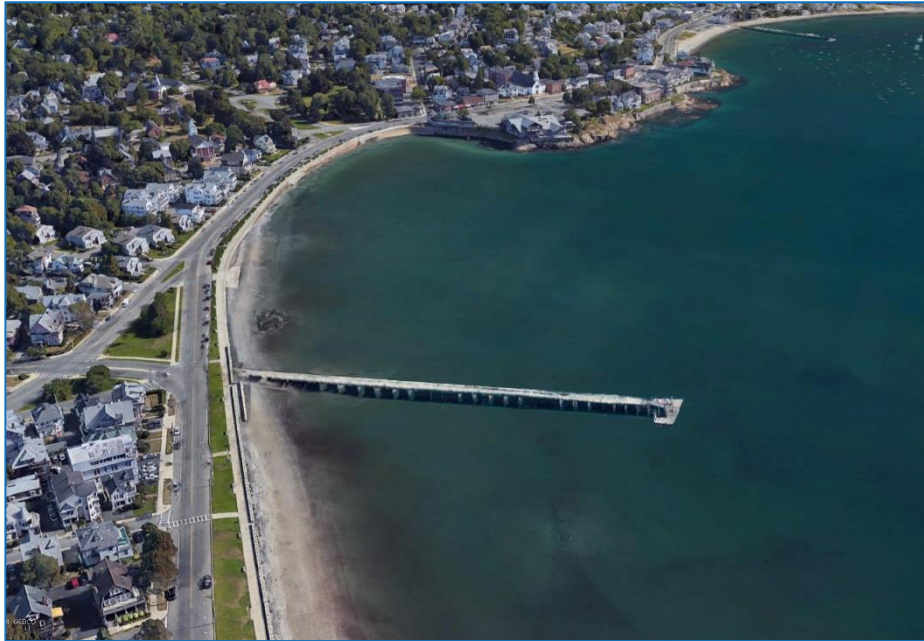
South Beach Miami Boardwalk (Photo credit:
S. Manoog, 11-17).



6.3 Kings Beach Pier

While researching the history of the Swampscott waterfront, the Swampscott Historical Commission uncovered evidence that a second municipal pier once existed in Swampscott. This pier, herein referred to as the King's Beach Pier, extended from the headwall of King's Beach out into Nahant Bay for nearly 600-feet.





6.4 Beach Amenities

6.4.1 Fisherman's Beach Amenities

Fisherman's Beach is one of the principal assets in the Swampscott portfolio, and is a large reason that many people move to and settle in Swampscott. Between the serene harbor and the City of Boston view in the background, Fisherman's Beach and the Harbor that surrounds it is a classic New England iconic destination. Fisherman's Beach could be enhanced with the addition of food and bathhouse amenities.



Widening and elevating the pier (for better storm protection), with rehabilitation of the supporting pilings, would allow for the addition of a restaurant on the pier at Fisherman's Beach. Inclusion of indoor and outdoor seating would act to attract boaters, beach-goers, and strollers to the waterfront and the businesses that are downtown.



Widening the pier would also create a broader passage along the pier and attract additional users, including families for fishing off of the pier. Coupled with the proposed Protective Living Reef and additional finger piers at the end of the Wharf, the pier at Fisherman's Beach would become a focal point of the Town's waterfront heritage and ambiance.

By widening the existing pier and adding a restaurant with indoor and outdoor seating, residents and visitors can have a mal on the pier and enjoy the water views.



Additionally, a snack shack with an attached bathhouse could be constructed at the western end of the parking lot. The bathrooms would be equipped with showers, foot washing stations, and changing rooms. Easy access to bathrooms and concessions will add to the enjoyment of Fisherman's Beach.



The "Clam Shack" on the point at Salem Willows. (Photo Credit: A. Rim, 09-18).

A Snack Shack building similar in size and function to that of the "Clam Shack" at Salem Willows would create an additional point along the Town beaches where food and bathrooms could be made available.



Outdoor tables at the "Clam Shack"

Aerial view rendering of potential amenities at Fisherman's Beach.



Dramatic lighting (at night) and addition of indoor seating would create a new vibe along the Swampscott coastline. When couple with the historic surroundings, beautiful views, and beach-front locale, it is expected that the additions would bring residents and visitors together on the waterfront. Regulatory requirements would need to be met, including environmental permit requirements and conformance with the State's Chapter 91 Law.

6.4.2 Whales / Eiseman's Beach Amenities

Eiseman's Beach represents one of the most historic spots in the Town. Once the site of the Ocean House, and then the New Ocean House, the property has played summer playground to some of the nation's most historic families, including President Calvin Coolidge and his family. Several presidents have stayed in the former hotels and resorts that existed in this neighborhood. Eiseman's Beach is a favorite with the local school children and residents. Inclusion of bathhouse amenities and the option to provide food would increase the utility and enjoyment of the beach. Because this beach and adjacent upland floods readily during storm events, it is recommended that the beach amenities outlined here-in include the shore protection strategies outlined in the Resiliency Report for Swampscott (Kleinfelder, et al, 2017) in order to protect the new assets and the existing street and residences across from the beach. Additionally, this Harbor and Waterfront Plan supports the *Beach Marker and Entrance Project* for the Town beaches started by the Municipal Design Committee, and now nearing completion with the help of Town staff. That set of projects, coupled with the projects offered as options through this Plan would significantly improve the utility of the beach and the area surrounding. In keeping with the Report entitled *Reimagining Johnson Park*, prepared in 2016 by Tufts University UEP, this Plan supports the development of a park and greenspace adjacent to Eiseman's Beach on the upland area that was at one time home to the beachfront resort hotel that existed along the waterfront there.



Re-imagined Johnson Park and Eiseman's Beach areas in Swampscott. Addition of park facilities and bathhouse facilities would improve the utility of the beach for families, and the addition of food options would be an attraction to locals and visitors. As a stop on the potential trolley line, discussed later on in this chapter, visitors would be able to visit Johnson Park and Eiseman's Beach without an automobile.

6.4.3 Phillips Beach Amenities

As one of the most popular beaches for the locals to hang out on nice summer days. The land adjacent to Phillips beach is underutilized. Improvements can include a snack shack and bath house equipped with showers, changing rooms, and foot washing stations. This area could also be improved with the addition of seasonal food trucks.



Addition of food options, a bathhouse, bathrooms, and a new entrance to the beach represent options that the Town has been contemplating for a long time. The Plan supports the development of these ideas and the installation of amenities at this the most visited of the Town beaches.

Adding a trolley stop at Philips Beach will alleviate some of the parking issues for visitors of the beach.

One potential configuration of added amenities at Phillips Beach is noted in the image below. This beach is used by much of the Town during the summer months. It is considered an important family beach in the Town. Amenities here would service beachgoers both from the Town and visitors that arrive by the trolley option (outlined below). In keeping with the Resiliency Review of the Town (Kleinfelder, 2017)



shore protection measures would be incorporated into the upgrades including berms, vegetative breakwaters, and the sculpting of the land to create a more protective barrier to storm damage in the future. In this scheme, the Town would issue vendors licenses for food trucks along the entrance road to the beach. A regulatory review to ensure compliance with state, local and federal regulations – including Chapter 91 regulations and coordination with the Conservation Commission - would need to be completed prior to further development of detailed plans for this locale as it is direct beachfront. With the optional upgrades noted herein, the utility of the beach by residents and visitors would increase.

6.5 Waterfront Parking

6.5.1 Fisherman's Beach & Downtown Parking Garage

Parking along beach areas in Swampscott is a seasonal issue, with limited street parking and few parking lot spaces available to residents and visitors.

One solution is to convert one of the commercial buildings in the downtown area to a partial parking garage. The space could support additional retail, restaurants, and professional space at the street level, with parking in covered space behind the street scape and on the roof of the building. It is estimated that such a facility could accommodate approximately 100 cars. With a reasonable charge rate of \$20 per day per car, it is estimated that the garage could net approximately \$1,000 per day on busy summer beach days. Annual revenues from such a facility could reach \$200,000 per year from parking alone. Retail on the first floor of the facility would result in additional income for the owner and additional options retail options for residence and visitors.



South Harbor Parking Garage, Salem, MA.

6.5.2 Parking at Phillips Fields

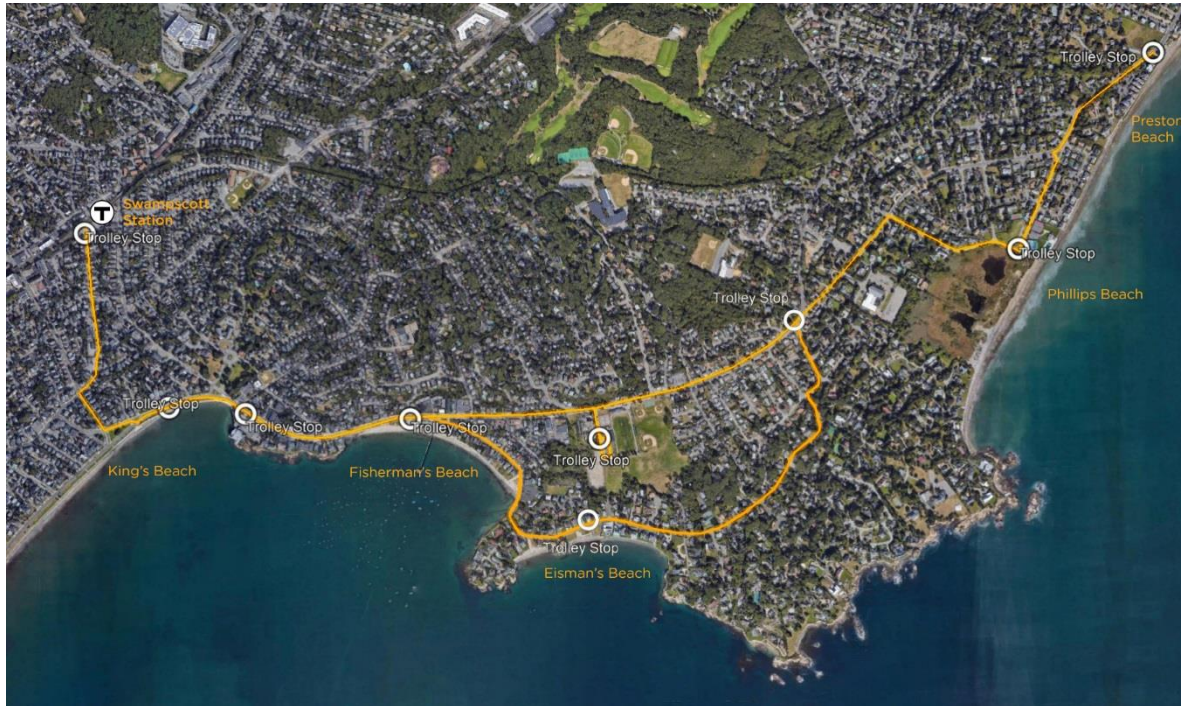
In order to satisfy the need for parking in the downtown area, the plan supports the development of a public parking lot adjacent to the Phillips Field complex and across from Eiseman's Beach (via a public walking path). As with all such public projects, coordination with the Department of Public Works, the Recreation Department, and the Planning Department will be needed to determine feasibility.



6.6 Seasonal Trolley Service Ties It All Together

Access to the Waterfront is a top priority of this Plan. A trolley will provide access to each of the Town's beaches from Kings Beach to Preston Beach, while making stops at Town parking lots and the Commuter Rail station. This would provide a non-auto-oriented method of accessing the waterfront, in addition to those who will walk and bike to the beaches. The images below show an example of what a trolley service could look like in Swampscott.





The map above shows a potential trolley route in Swampscott. The Trolley would initiate its route at the Town MBTA rail station on Railroad Avenue, and would make a large loop around the coastal portion of the Town, stopping at all of the major beaches in the Town, as well as the parking lots within the Town (existing and proposed), and the downtown area. Developing this trolley route will also fulfill a transportation goal of the Master Plan, which calls for improved connections between the Commuter Rail Station, Humphrey Street, and beaches¹¹.

¹¹ Swampscott 2025 The Master Plan, pg. 126.

6.7 Swampscott's Own Hotel and Conference Center

The 2025 Master Plan states that "Establishment of a new hotel would catalyze tourism in Town¹²." Patterned after the highly successful model at Pickering Wharf in Salem, MA, a waterfront hotel and conference center will serve as a destination for business conferences, vacations, weddings, and other

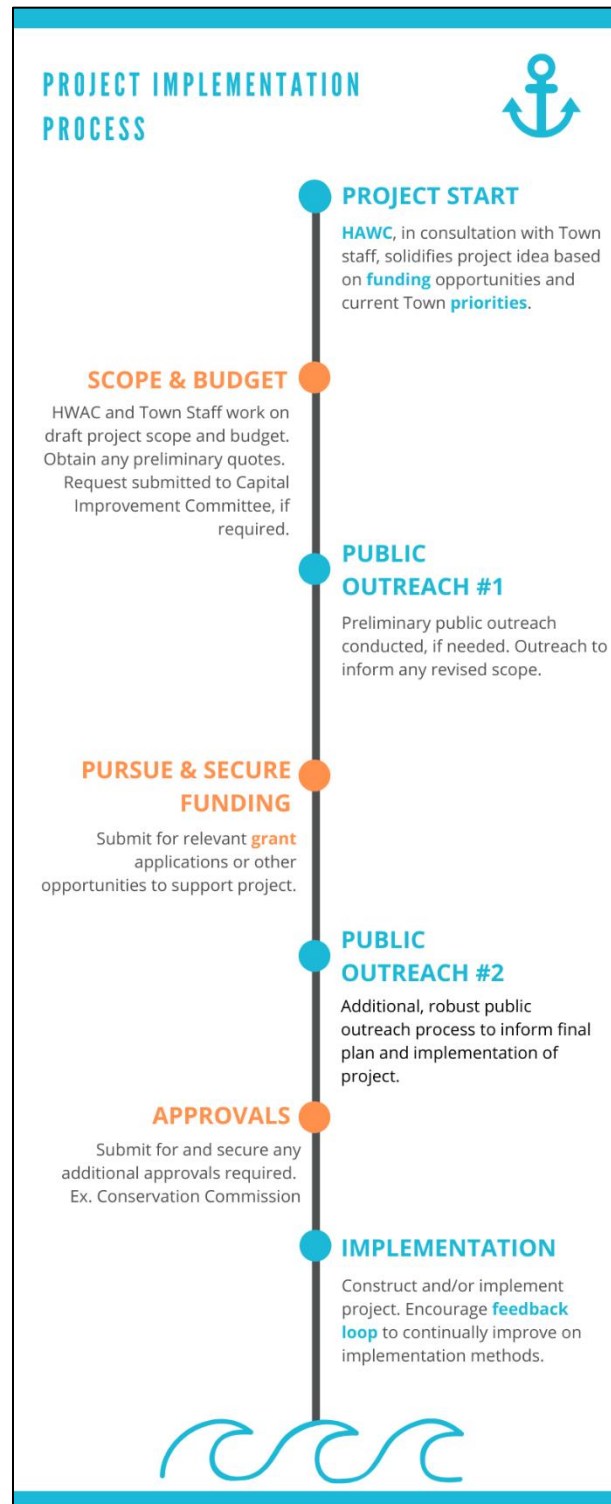


celebrations. The Town should explore future opportunities for the development of a new hotel and how to best incorporate this along the waterfront.

¹² Swampscott 2025 Master Plan, pg. 45.

6.8 Roadmap for Implementation

The Harbor and Waterfront Plan is a visionary document meant to generate interest and movement towards improving Swampscott's coastal economy and amenities. Implementation of the ideas and objectives presented in this plan will still undergo a public review process, and final outcomes may change depending upon Town needs, priorities, and funding opportunities. The image to the left describes a project implementation process which would include additional public outreach as the Harbor and Waterfront Committee, working with Town staff, pursues different funding opportunities to implement some of the projects described in this plan.



7. FESTIVALS, EVENTS, AND ART

Swampscott has an active events calendar, with small to large gatherings occurring during the spring, summer, and fall months. These events are typically attended by residents and their friends, family, and colleagues. While the events are well attended given the size and population of the Town, they are typically marketed as in-Town venues and there has not been outreach significantly beyond the Town. For many of the events that are held (or could be held in Town), this is a desired outcome. The events that are provided are put on mostly by Town residents and attended by Town residents. This is a departure from many of the Cities and Towns that surround Swampscott, where one of the goals of the events is to attract tourists and non-residents as well as residents, creating larger events with a two-fold result:

- Raising funds and creating an economic engine that benefits both the event and the event sponsor, as well as Town businesses and individuals;
- Introducing the public (including those from outside of Town) to the amenities that the Town has; enticing visitors to come back, to shop, to stay in local venues, and to interact with the community.

The surrounding Cities and Towns have at least one (and often several) very well attended venues that represent activities that can be enjoyed by both residents and visitors. Examples of these include (not intended to be a complete listing):

- Marblehead:
 - Marblehead Summer Arts Festival – attended by approximately 50,000+ over 5-days;
 - Marblehead Christmas Festival – attended by approximately 20,000+ over 4-days;
 - Marblehead Historic Muster – attracts 10,000+ visitors for one weekend;
 - Marblehead Sail Races – attracts visitors on land and also vessels and visitors on the water – attended by 10,000 + visitors and 110's of vessels throughout the summer sail racing months.
- Salem:
 - Halloween – attracts over 1 million+ people during the month of October;
 - Harborfest – attended by approximately 10,000+ during July;
 - Tall ships festival – (periodic, but not annual event) – attracts 5,000+ visitors and dozens of vessels to the harbor;
 - Restaurant week – attracts 1,000 patrons – typically in the spring or early summer;
 - Salem triathlon – attracts 100's of participants and spectators (early summer).

The Plan supports the existing festivals that are celebrated in Swampscott. Examples of the events currently being celebrated on a regular (annual or other repetitive basis) include:

- Swampscott Yacht Club Lobster Festival;
- Sailboat racing (weekly during the summer);
- Antique Car Festival (Town activity occurring on Monument and surrounding area);
- Swampscott triathlon;
- Fall harvest festival (fall);
- Octoberfest (neighborhood activity);
- Weekly Farmers Market (Swampscott schools).

7.1 Events, Gatherings, Competitions, and Festivals

As a way to encourage community spirit, interconnection of neighborhoods, good neighbors, and a sense of place for existing residents and families, the plan supports the concept of increasing both the size and the number of events and festivals that occur in the Town. The plan also supports expanding the breath and scale of certain types of events with the goal of attracting visitors from outside the Town. With sufficient branding and marketing, it is expected that event attendance will increase and new audiences will visit the Town. The types of venues that could be considered that would be consistent with the Town's history and the tenor to this Harbor Plan:

- Waterfront Festival;
- Sailing Regattas;
- Chowder / Lobster Bisque Competitions;
- Restaurant Week;
- Fishing Derby's / Competitions;
- Arts Festival;
- Music Festivals;
- Octoberfest;
- Halloween Festival;
- Holidays in the Port;
- Antique Auto Festival;
- Aeronautics and Airplane Festival;
- Lobster Bake;
- Beach Days;
- etc....

The Plan supports the amplification of these events, marketing and encourages sponsorship from vendors, businesses, sponsors, etc.

7.2 Art & Installations

Swampscott has a long history in the Art and Landscape areas. Additionally, the history of the Town is steeped with extremely interesting milestones and events that lend themselves to the development of both permanent and temporary Art Installations. Types of installations that could be developed along the waterfront include:

- Music installations;
- Dance;
- Theatre;
- Sculpture (e.g., Swampscott dory, Lobster Traps, Early Aircraft, boats, sailing vessels);
- Installations.

In particular, it is thought that an iconic sculpture related to Swampscott residents and the sea and boating that becomes a symbol of the Town (similar to the sculpture of the fisherman in Gloucester).

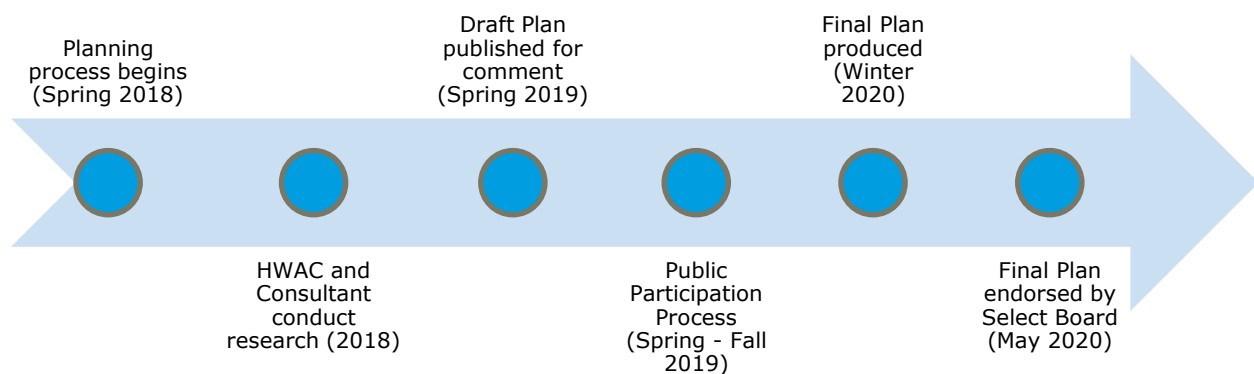
- Bike racks at key locations to minimize motorized vehicular traffic
- Ensure adequate vehicular parking. Utilize trolley system to tie parking lots into Town system
- Establishment of a B&B / hotel zone. Protect from flooding. Ensure public access through waterfront

APPENDIX A

PLANNING PROCESS AND STAKEHOLDER PARTICIPATION

The Harbor and Waterfront Advisory Committee (HWAC) identified the need for a comprehensive planning document to guide the development of the Town's harbor and waterfront activities and began working towards that end in 2018. The completion of the plan will allow HWAC, Town Departments, and other Town Committees to better coordinate harbor and waterfront related projects and programs; and will enable the Town to pursue funding opportunities related to Harbor planning and management from state and federal sources.

HWAC, funded through a State grant from the Seaport Advisory Council, procured a consultant to assist in the initial planning process, which officially began in the spring of 2018. In 2019, the consultant finished their part of the project and turned the draft planning document over to the Committee, who took the plan through the public process to finalization. HWAC met approximately once a month during the planning process to discuss plan elements, work with other Town Departments, discuss public engagement efforts, create draft outreach materials, hold public engagement events and public meetings, and advanced the progress of the project to completion. The Advisory Committee prioritized planning objectives, refined recommendations, and assisted the consultant in incorporating other public comments into the plan. Committee members also worked with the Town Administrator, the Department of Public Works, and the Department of Community & Economic Development throughout the project. The HWACs consultant provided a draft plan to the Committee, and since that time, the Committee has undertaken the additional public engagement efforts and final edits to the plan. A timeline graphic of the process is provided below:



PUBLIC PARTICIPATION

The Committee began work on the Harbor & Waterfront Plan in earnest in 2018, with the goal of producing a draft plan for public comment before ultimately bringing the plan before the Select Board for endorsement.

There were several public outreach activities, including:

- Poster session Public Outreach at the Fish House Republican Fund Raiser (April 2018)
- Presentation and Public Outreach: Harbor Plan topic discussion forum at the “Ideas” forum (Dec. 1, 2018)
- Presentation(s) to the Board of Selectmen (April 24, 2019)
- Presentation at annual Town Meeting (May 20, 2019)
- Presentation to Historical Commission (May 7, 2019)
- Poster booth at multiple Farmer’s Markets (Summer 2019)
- Presentation to the Open Space Committee (Aug 20, 2019)
- Multiple meetings about the Harbor & Waterfront Plan with Town Administrator (2019-2020)
- Annual Harbor Fest (June 22, 2019)

HWAC committee members and the project team and consultants also met with members of *For the Love of Swampscott* and the *Open Space and Recreation Plan Committee*.

Community Survey

The Committee, assisted by the Department of Community & Economic Development, created an online survey to help gather input and feedback from the community on the draft plan. The survey consisted of six (6) specific questions designed to gather comments on the short-term and long-term goals of the plan, as well as the project ideas presented. Members of the Committee distributed postcards with information on how to take the survey during poster booth sessions at the Farmer’s Market on Swampscott Town Hall Green weekly during the summer of 2019, and the survey link was also posted on the Committee website. The survey was opened in June and closed at the end of August 2019, and 193 responses were collected.

Generally, the survey results showed support for the short-term goals, long-term goals, and project ideas presented in the plan. A short overview is provided here:

Short-Term Goals:

- Short Term Goals #1 and #2 were considered extremely important
- Short Term Goal #3 was considered the least important

Long-Term Goals:

- All Long-Term Goals were considered either fairly important or extremely important
- Long Term Goal #7 and Goal #4 received the highest number of designations as extremely important

Present & Future Projects:

- The new Swampscott harbor design, the Swampscott promenade, and the proposed beach amenities were the most supported project ideas
- The seasonal trolley was partially supported, with most respondents indicating they would definitely support or they were neutral

- The Swampscott hotel & conference center and the proposed downtown parking garage received the least amount of support

A summary of responses is included at the end of this section for all multiple-choice questions. A full copy of all responses is at the end of this Appendix section.

Survey Summary of Responses:

Key:

■ Not Important At All	■ Somewhat Important	■ Fairly Important
■ Extremely Important		

For Short-Term Goals:

1) Mitigate Impacts to Areas Most Vulnerable to Flooding, Increase Boat Presence, and Protect Boats in The Harbor by Installing Two Protective Living Reefs.



2) Promote the waterfront as a focal point for Swampscott's visitor economy, emphasizing cultural tourism, high quality recreational experiences, and longer visitor stays.



3) Improve accessibility for larger boats through harbor maintenance.



4) Address the shortage of parking along the waterfront.



For Long-Term Goals:

1) Consistent with Swampscott's maritime and seacoast resort history, strengthen the access to, and visibility of the harbor on the landside for residents and visitors alike.

Results:



2) Maximize the economic potential of the harbor through economic development goals, while enhancing the quality of life for residents in adjacent areas.

Results:



3) Promote the waterfront as a focal point for Swampscott's visitor economy, emphasizing cultural tourism, high quality recreational experiences and longer visitor stays.

Results:



4) Protect and enhance access to the waterfront for the Swampscott community for passive and active recreation; reconnect the community to its waterfront where the connection does not currently exist.

Results:



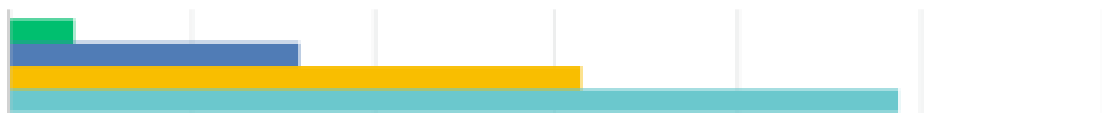
5) Protect and preserve those aspects of Swampscott's waterfront experience which can beneficially link the Town to its maritime and seacoast resort past.

Results:



6) Ensure that public investment in waterfront infrastructure will support and encourage private investment. Develop long-term capital maintenance/management strategies to ensure that public investment will result in infrastructure that is sustainable over the long-term.

Results:



7) Protect and enhance the environmental quality of the harbor and its environs as an essential component of any proposed development or revitalization efforts.

Results:



Community Meetings

In addition to the Committee's regular meetings and other public presentations listed above, HWAC hosted two (2) additional public meetings to discuss the draft plan elements with the community and get additional feedback. The meetings were held on Thursday, October 3rd, and Wednesday, October 16th, at the Swampscott High School from 7:00 pm to 9:00 pm. In addition to committee members present, about 40+ members of the public attended these sessions.

Regional View

Swampscott is a member of the Metropolitan Area Planning Council (MAPC) as well as the North Shore Task Force (NSTF). NSTF is one of eight subregions of MAPC that consists of 16 communities that meet regularly to discuss issues of common interest related to open space and other regional initiatives.

MAPC has devised a comprehensive, regional, and long-range plan called MetroFuture to help the Greater Boston Region capitalize on its most important assets: its diverse people and landscape, a history of innovation, and a commitment to education and civic engagement. Swampscott's Open Space and Recreation Plan are consistent with many implementation strategies of MetroFuture, most notably: To protect natural landscapes, conserve natural resources, and to support healthy families. Swampscott's plan addresses the implementation strategies noted by promoting healthy living and recreation through open space preservation, expansion, and maintenance, as well as through community engagement. Additionally, Swampscott has promoted regionalization through the plan by our consideration of the open space plans of surrounding communities, as well as possible regional open space resources that relate to climate change.

Ideas and Public Input Gathered from the HWAC Public Forums held at Swampscott High School and from public participation in HWAC meetings.

The following raw concepts, ideas, and input were gathered during the public participation process, and have been incorporated into the Harbor and Waterfront Plan:

On Climate Change and Resiliency:

- Infrastructure: Protective Living Reef, bulkheads, ocean walk, cliff walk, trolley line, bike/walking paths, vegetated berms, etc.
- Funding: State and Federal grant opportunities
- Interface with Other Town Plans/Groups
- Evaluate risks associated with Sandy-type events and evaluate residents' savings in flood insurance rates if resiliency measures are implemented.

On Boating, Marine Infrastructure, and Ecologic Resources:

- Infrastructure: breakwater, docks, floats, mooring field
- Existing commercial fishing industry
- Fisherman's Beach as the Boater's Beach
- Larger floats at Fisherman's Beach – including dockage space for Town Harbor Master, smaller floats throughout the water-sheet for prams
- Floats for the storage of the Town's "420-design" sailboats
- Floats on east side of Town mooring field
- Kayak / canoe racks at Town put ins
- Farming / exporting of eel grass, mussel beds, hard clam beds, oysters, fisheries
- Continued improvement of water quality through stormwater treatment, no discharge zones, limits CSOs, increase in shellfish beds
- Clean up King's Beach
- Funding / grant sources including BIG grants, water-quality-improvement grants, etc.

On Community and Economic Resources:

- Trolley from train station to waterfront – Harbor Walk / Freedom Trail
- Host sailing and rowing races. Historic vessels, specific classes (420s, Optimist, Swampscott Dories, etc.), team rowing
- Harbor-fest(s), with focusses on sailing, boat building, aquaculture, etc.
- History of Swampscott
 - Fishing tradition of Swampscott
 - Dory workshop and sailing
 - Educational – "make a lobster trap," and track it to see if "it catches lobsters"

- *Arts - Paintings along street.*
- Popup / seasonal museums specific to the history of Swampscott
- Educational / Historic kiosks. Potentially with bar-code accessible Internet explanation information. Include Wi-Fi, personal device recharging station, public rest room facilities and adequate trash disposal facilities
- Stone historic markers “what happened here or near here”
- Host historic reenactments (Revolutionary and Civil wars, native American fishing camps, vessel construction, a day on the beach in 1850, cooking for the family in 1850
- Swampscott as a historic and current Beach Destination.

APPENDIX B

GOVERNANCE AND REGULATORY JURISDICTIONS

Public and Private Lands

Preservation of open space has begun to be an extremely important talking point within the Town, due to the higher than average density of housing stock and lack of athletic field/open space. The protection of these and other natural resources is paramount for the health and well-being of the residents of Swampscott. Such lands provide places for recreation, valuable ecosystem services, as well as wildlife protection. "Protected" land is defined by the Division of Conservation Services if it is owned by the local Conservation Commission, a state conservation agency, a non-profit land trust, or if the municipality received state or federal monies for the improvement or purchase of the land. Private property can also be protected if there is a deed restriction, or if Massachusetts Department of Environmental Protection states that a piece of land should be deemed a wetland conservation area. Like many other cities and towns in the Commonwealth, Swampscott's open spaces are defined as undeveloped and developed parcels of land that provide passive or active recreational opportunities. These parcels have been delineated as Publicly Owned or Privately-Owned and then categorized as beaches, conservation areas, parks and recreation areas and rights of way. This inventory also includes Private Lands with Future Public Benefit which are privately-owned properties that do not currently have any form of open space protection nor public access but due to their relevance in the community could provide a future public benefit.

What separates this small, built-out suburban community from so many others in Massachusetts is the 6,190 feet of accessible, viewable, wide open oceanfront. The ocean adds another dimension to Swampscott's definition of open space: a true sense of vastness that meets residents at the edge of Town. The ocean is part of its identity, so much so that it is often taken for granted that the spectacular views and ease of stepping onto the sandy beaches will always be available.

It is perhaps this, and the constant prospect of redevelopment, that puts it so at risk. Add to this the fact that the town beaches are owned both privately and publicly, a situation not always well defined or understood. It should be noted, however, that while some of the community's beach land is privately-owned, the public is provided some access rights of the beach area between the high and low mean watermarks. Over the years, Massachusetts courts have ruled that the scope of activities on private tidelands covered by the reserved public rights of fishing, fowling, and navigation is broad, and includes all of their "natural derivatives." For example: The right to fish includes the right to seek or take any fish, shellfish, or floating marine plants, from a vessel or on foot; and The right to navigate includes the right to conduct any activity involving the movement of a boat, vessel, float, or other watercraft, as well as the transport of people and materials and related loading and unloading activity.

According to the Massachusetts Heritage Landscape Inventory Program's Swampscott Reconnaissance Report,¹³ "there are five public ways to the water including Phillips, Preston, Little's Point, Martin Way and a right-of-way off Puritan Road. Despite these public ways, access is limited in part due to the lack of parking near these ways and lack of knowledge and perception about the use of these ways." Each of Swampscott's beaches and Palmer Pond has at least one publicly accessible point to reach the waterfront, as described in Section 2.5 of this report.

¹³ "Swampscott Reconnaissance Report: Essex County Landscape Inventory, Massachusetts Heritage Landscape Inventory Program" p9

APPENDIX C

OTHER REGULATIONS AND PERMIT REQUIREMENTS

The harbor and adjoining waters are subject to regulatory authority of the local, state, and federal governments.

Local

Wetlands Regulations

The wetlands surrounding Swampscott are critical to water quality protection and habitat preservation. Wetlands perform essential functions, such as buffering against erosion, sedimentation control, flood protection and abatement; water filtration and purification; fish and wildlife habitat; and providing recreational activities. Under the Wetlands Protection Act, created in 1965, (Massachusetts General Law 131, Section 40), the Conservation Commission has jurisdiction over all of the wetlands in Swampscott and all land within the 100-foot buffer zone adjacent to the waterways and wetlands. Under this law, the Conservation Commission is charged with protecting these natural resources to prevent pollution, protect drinking water, to improve flood control, to protect wildlife and to protect fisheries.

The Wetlands Protection Act through the Wetlands Protection Program requires local conservation commissions to examine and regulate development activities which may alter wetlands, and to issue or deny permits based on whether the proposed activity is consistent with the requirements of the Wetlands Protection Act and MassDEP regulations (state Wetlands Regulations at 310 CMR 10.00 provide clarification of the provisions of the Act). MassDEP issues superseding orders and variances, and offers compliance, enforcement, and technical assistance. Under the Wetlands Act, the local Conservation Commission has authority over projects in or affecting five categories of resource areas: bank, beach, dune, flat, marsh, swamp, freshwater or coastal wetlands which border on the ocean or any estuary, creek, river, stream, pond or lake. The Conservation Commission also has jurisdiction for land under water bodies, land subject to tidal action, land subject to coastal storm flows, and land subject to flooding. Activities within these resource areas subject to jurisdiction include activities that would remove, fill, dredge or alter the resource. The Commission also has the right of review for activities within a 100-foot buffer zone around wetlands bordering water bodies, banks, beaches, and dunes. The Swampscott Conservation Commission has responsibilities to plan for, acquire, and manage open space as well as to promote conservation restrictions.

According to the 1983 Open Space and Recreation Master Plan, "the Swampscott Conservation Commission, in 1972, was one of the first Conservation Commissions in the Commonwealth to undertake a scientific mapping of the town's wetlands. The work was done by an experienced firm of environmental consultants, and the map has been a useful tool in planning, and in administering the Wetlands Protection Act."

To provide more effective protection of wetlands, at the 1976 annual Swampscott Town Meeting, the Town's zoning by-laws were amended to create a Flood Plain/Wetlands Protection District - "Article IV. Special Regulations, 4.1.0.0. Flood Plain/Wetland Protection Overlay District."

The 1983 Open Space and Recreation Master Plan found that, "[f]or a community of such small geographic size, Swampscott has a wetlands network with an interesting variety of geologic origins." These wetlands include:

- Wetlands remaining following the draining and eutrophication of glacial ponds that became impounded in depressions. The largest wetland of this kind in town is within the Harold King Town Forest.
- Wetlands formed by streams and their floodplains that occurred as a result of the draining of glacial ponds or upland ice formations. When the ice melted and the ponds drained out, these streams became seasonally intermittent, as they are now. An example of such a stream system is the one that extends easterly parallel to the railroad bed at Tedesco Country Club, and One Salem Street property.
- Wetlands formed when coastal marshes became isolated from the sea through the accumulations of barrier beaches. Palmer Pond is a classic example of such a wetland. The low-lying area west of Phillips Park below Humphrey Street, once known as Cedar Swamp but gradually filled and developed is another example of such a (former) wetland.

In 1976, the Conservation Commission in conjunction with five other Town boards, finally succeeded, after five unsuccessful previous attempts, in persuading the Town to enact a wetland zoning by-law. The Flood Plain/Wetland Protection District, where recreational uses are encouraged and building is prohibited, was voted in unanimously by Town Meeting.

The Conservation Commission proposed, and in the 1974 Town Meeting adopted, an amendment to the Town's zoning by-laws which require developers to submit an Environmental Impact Statement for Town boards' and public inspection before subdivision or use permits are granted.

To provide more effective protection of wetlands, at the 1976 annual Swampscott Town Meeting, the Town's zoning by-laws were amended to create a Flood Plain/Wetlands Protection District - "Article IV. Special Regulations, 4.1.0.0. Flood Plain/Wetland Protection Overlay District."

The purposes of the Flood Plain/Wetland Protection Overlay District (FPWPOD) are listed in 4.1.1.0. as follows:

- 4.1.1.1. To provide that lands in the Town of Swampscott subject to seasonal or periodic flooding as described hereinafter shall not be used for residence or other purposes in such a manner as to endanger health or safety.
- 4.1.1.2. To protect, preserve and maintain the water table and water recharge areas within the town so as to preserve present and potential water supplies for the public health and safety.
- 4.1.1.3. To assure the continuation of the natural flow pattern of the water courses within the Town of Swampscott in order to provide adequate and safe flood water storage capacity to protect persons and property against the hazards of flood inundation.
- 4.1.1.4. To protect the Town of Swampscott against the costs which may be incurred through the unsuitable use of wetland.
- 4.1.1.5. To conserve natural conditions, wildlife, open space and generally the amenities of the Town of Swampscott and otherwise to preserve, protect and promote the health, safety and welfare of the public.
- 4.1.2.0. Location of District. The FPWPOD shall include all land shown on the Flood Plain/Wetland Protection District Map by contour and/or elevation markings, which were established following an evaluation of the vegetation, the high-water mark, and the historical or the projected flood elevations. The Swampscott Flood Plain/Wetland Protection District Map, dated April 1, 1976 and signed by the

Town Engineer, and as thereafter amended, is hereby made a part of this By-Law and is on file at the Town Clerk's office.

Additionally, the following Town plans and regulations may be applicable:

- Swampscott Beach Management Plan (April 1, 2011)
- Town of Swampscott Zoning Regulations
- Town of Swampscott Open Space and Recreation Plan

State

Chapter 91

Massachusetts General Law Chapter 91 (Public Waterfront Act) and the Waterways Regulations (310 CMR 9.00), which was adopted to implement the law, seek to ensure that the Commonwealth's tidelands are utilized only for water-dependent uses or otherwise "serve a proper public purpose which provides greater benefit than detriment to the rights of the public in said lands." The Chapter 91 licensing program is administered by the Waterways Regulation Program of the Massachusetts Department of Environmental Protection (MassDEP). Chapter 91 applies in tidelands¹⁴, great ponds, and along certain rivers and streams.

Chapter 91 authorization in the form of a State-issued license is generally required for the placement of fill, building of structures, and dredging in tidelands. Types of structures include: piers, wharves, floats, retaining walls, revetments, pilings, bridges, dams, and waterfront buildings (if on filled lands or over the water). A new license also may be required if there has been a structural change or change in use of a previously licensed structure. The placement of temporary rafts, floats or moorings in the waterway do not require a Chapter 91 license, if they receive an annual permit from the Harbormaster, per Chapter 91 Section 10A.

In general, uses licensed under the waterways program must either be water-dependent or "serve a proper public purpose, which provides greater benefit than detriment to the rights of the public in said lands." A water-dependent use is one that requires direct access to or location in tidal or inland waters, and therefore cannot be located away from said waters. A full definition of water-dependent uses can be found in the regulations (see 310 CMR 9.12(2)). Among the uses defined as water dependent that are likely to apply to Swampscott are:

- Marinas, boat basins, channels, storage areas, and other commercial or recreational boating facilities;
- Facilities for fishing, swimming, diving, and other water-based recreational activities;
- Parks, esplanades, boardwalks, and other pedestrian facilities that promote use and enjoyment of the water by the general public and are located at or near the water's edge, including but not limited to any park adjacent to a waterway and created by a public agency;
- Dredging for navigation channels, boat basins, and other water-dependent purposes and subaqueous disposal of the dredged materials below the low water mark;

¹⁴ Tidelands refer to all land presently or formerly beneath the waters of the ocean at mean high tide. On the landside, tidelands extend to the *historic* high tide line, i.e., the farthest landward tide line which existed "prior to human alteration" by filling, dredging, impoundment or other means. Generally, DEP jurisdiction applies to all filled as well as flowed tidelands, with the possible exception of "landlocked" tidelands.

- Navigation aids, marine police and fire stations, and other facilities which promote public safety and law enforcement on the waterways;
- Shore protection structures, such as seawalls, bulkheads, revetments, dikes, breakwaters, and any associated fill which are necessary either to protect an existing structure from natural erosion or accretion, or to protect, construct, or expand a water-dependent use;
- Flood, water level, or tidal control facilities; and
- Discharge pipes, outfalls, tunnels, and diffuser systems for conveyance of storm water, wastewater, or other effluents to a receiving waterway.

Federal

The Clean Water Act

Section 404 of the Federal Clean Water Act establishes a permit program to regulate discharges of dredged or fill material into wetlands and other waters of the US. In tidal areas, "waters of the US" extend to the (spring) high tide line. The Section 404 permit program is implemented by the US Army Corps of Engineers (USACE). The National Marine Fisheries Service and Fish and Wildlife Service have advisory review role. In addition, Section 404(c) gives the US Environmental Protection Agency (USEPA) veto authority over the Corps' decision to issue a permit.

The USACE cannot issue a Section 404 permit unless it determines that:

1) The proposed project is not contrary to the public interest. The general criteria for the public interest review are in 33 CFR section 320. The factors involving the public interest include economics, environmental concerns, historical values, fish and wildlife, aesthetics, flood damage prevention, land use classifications, navigation, recreation, water supply, water quality, energy needs, food production and the general welfare of the public.

2) The proposed project complies with the Section 404(b)(1) Guidelines. Section 404(b)(1) Guidelines are federal regulations (40 CFR section 230) that provide the environmental criteria to be satisfied before a Section 404 permit involving discharge of dredged or fill material can be issued.

The 404(b)(1) Guidelines prohibit discharging of dredged or fill material if there is a practicable alternative. An alternative is practicable if it is available and capable of being accomplished considering cost, existing technology and logistics, and overall project purpose. The Guidelines also require that the discharger undertake all appropriate and practicable mitigation measures to minimize any potential harm to the aquatic ecosystem. The Corps' evaluation of a project under these standards progress through the following stages: avoidance of impacts where practicable through the evaluation of alternative sites; minimization of impacts; and appropriate and practicable compensation of unavoidable impacts through wetlands creation or restoration. Section 401 of the Clean Water Act requires a water quality certification from the state in which a discharge under a 404 permit will originate. The certification states that the discharge complies with the state water quality criteria.

The Rivers and Harbors Act of 1899

Section 10 of the Federal Rivers and Harbors Act of 1899 authorizes the United States Army Corps of Engineers (USACE) to regulate structures and work in navigable waters of U.S. Jurisdiction extends shoreward to the mean high-water line. Regulated activities include construction of piers and wharves, permanent mooring structures such as pilings, intake and

outfall pipes, boat ramps, and dredging or disposal of dredged material, excavation, and filling.

Federal Emergency Management Agency (FEMA)

FEMA performed a Flood Insurance Study in Swampscott in July 2014. The study utilized hydrologic and hydraulic analyses to establish Flood Insurance Zones and flood plain management measures for the area. The investigation considered historic flood elevations, estimates of shoreline levels considering still water and wave run-up for various storm frequencies. The study provides a plan of the various Flood Insurance Zones along the harbor as established by this study. The following summary describes the Swampscott Harbor area zone designations in detail:

- *Zone A:* Special Flood Hazard Areas inundated by types of 100-year shallow flooding, determined by the approximate methods; no flood elevations shown, or flood hazard factors determined.
- *Zone AO:* Areas of 100-year, shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
- *Zone A2 & A4:* Special Flood Hazard Areas inundated by the 100-year flood, base flood elevations shown, and zones subdivided accordingly.
- *Zone V2 - V4:* Areas of 100-year coastal flooding with velocity (wave action); base flood elevations and flood hazard factors determined.
- *Zone B:* Areas between the limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or area protected by levees from the base flood.
- *Zone C:* Areas of minimal flooding.

The FEMA Flood Insurance Rate Map (FIRM)⁴⁴ for Swampscott shows that there are principally three flood hazard zones in the town. See "Map 7 - Flood Hazard Zones" for the locations of these flood hazard zones:

- Zone VE described as "High Risk - Coast Areas" and "having a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage." Zone VE runs along the entire coastline of Swampscott.
- Zone AO described as "High Risk Areas" and "river or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from one to three feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage." Zone AO runs along and just north of Puritan Road, and in small areas by King's Beach and Palmer Pond.
- Zone AE described as "High Risk Areas" and as "base floodplain." Zone AE is in small areas by the Phillips Beach and Preston Beach.

General Permitting Requirements for Dredged Material

Regulatory permitting for dredging projects requires approvals from many agencies. The following is a list of required regulatory agency approvals:

1. The USACE is required to review the project for possible impacts on navigation, flooding, coastal resources, and the transportation and disposal of sediment in navigable waters. A Corps' review

involves several other agencies including the USEPA, National Marine Fisheries, U.S. Fish and Wildlife Service, and the State Historic Commission. Filing of a Corps of Engineers application initiates a review process which includes a suitability determination for the disposal of dredged material, addresses historic resource, environmental, navigation and abutter issues, and begins a public notification process that, if the project meets all permitting requirements, concludes with a permit describing necessary dredging operational procedures.

2. Massachusetts Environmental Protection Act (MEPA) requires submission of an Environmental Notification Form (ENF) for dredging projects anticipating the removal of over 10,000 cubic yards of material. This form is reviewed by and comments are sought from many agencies. The MEPA process also involves a 30-day public review process. The public notification is accomplished by publication of the first page of the ENF in the Environmental Monitor. The review identifies project elements that need to be considered in the design and permitting of the project and determines whether the project requires the filing of an Environmental Impact Report (EIR). At the conclusion of the ENF review a certification is issued by the Secretary of Energy and Environmental Affairs indicated whether the ENF satisfied the MEPA requirements or if an EIR is required. Other State agencies cannot issue their approvals, or funds, until the MEPA process is completed.

3. MassDEP Wetlands and Waterways has three departmental agency approvals. They are: a) a Water Quality Certification for the dredging and for the handling and disposal of dredged material; b) a Chapter 91 permit granted under Waterways Regulatory Program for the proposed dredging and development activities and c) a local Conservation Commission's review of the project's impact on area's wetland resources.

4. The MCZM office will complete a consistency review as part of the Army Corps' federal permit process. MCZM will also determine whether the proposed project satisfied State-level policies. These include defined requirements regarding Water Quality, Habitat, Protected Areas, Coastal Hazards, Port and Harbor Infrastructure, Public Access, Energy, Ocean Resources, and Growth Management.

5. The local Conservation Commission must receive a Notice of Intent (NOI) for the project. After review by the Commission, an Order of Conditions may be issued outlining the procedures and mitigation measures required to minimize impact on wetland resources. Bathymetric survey, identification of resources, sediment sampling and testing are required to describe the project for NOI submittal. The Conservation Commission review process includes a public hearing where the applicant presents the project and how it conforms to the requirements of the Massachusetts Wetlands Protection Act. Comments from proponents, opponents, and abutters are heard during the hearing.

APPENDIX D

POTENTIAL FUNDING SOURCES

Revenue Generated through Operations

Revenue can be generated for day-to-day operations through shellfish licensing, beach permitting, and parking permitting.

Federal and State Resiliency Programs

Clean Waters Grants

Target sources from the Community Development Plan:

- The Massachusetts Self-Help Program assists municipalities with acquiring land for conservation and passive outdoor recreation. Depending upon a community's equalized valuation per capita decimal rank, the state reimburses 52% to 72% of the acquisition cost (www.state.ma.us/envir/dcs/selfhelp/default.htm).
- The Federal Land and Water Conservation Fund is administered by the State Division of Conservation Services for the acquisition and development or renovation of park, recreation, or conservation land. The program reimburses 50% of the total cost of public outdoor recreation projects with a maximum award limit of \$150,000.

See www.state.ma.us/envir/dcs/LandWater/default.htm.
- The Massachusetts Greenways and Trails Demonstration Grant Program is administered by the Department of Environmental Management for the planning and construction of trails and greenways. The maximum grant award is \$3,000.

See www.state.ma.us/dem/programs/greenway/grants.htm
- Information on the Recreational Trails Program can be found at www.state.ma.us/dem/programs/trails/grants.htm.
- TEA-21 Transportation Enhancement Funds can be used to fund acquisition of trails, scenic easements, pedestrian, and bicycle facilities. www.state.ma.us/mhd/publications/other.htm.
- The Manomet Center for Conservation Services has a comprehensive grants directory for open space conservation at www.manomet.org/regional/resources. This includes government sources and private funding sources.
- Kodak American Greenways Award Program (www.conservationfund.org/?article=2106)
- Fields Pond Foundation (www.fieldspond.org)
- Numerous grants are available for natural resource protection from national foundations. Often, they are only available to non-profits. The town should work closely with the Swampscott Open Land Trust to see if there are opportunities apply for grant. Examples of grants include: Timberland (www.timberland.com/cgi-bin/timberland/timberland/candj/tim_index.jsp); New England Grassroots Environment Fund (www.grassrootsfund.org); and REI's Outdoor Recreation Grant (www.rei.com/aboutrei/gives02.html?stat=side_32).

State of MA Grant Programs:

Target sources for the Massachusetts Legislature and Executive Funding Initiatives:

- The Massachusetts Seaport Economic Council Grants. Rolling Grant program for waterfront communities in Massachusetts that have economic and/or social interest in the coastline of the Commonwealth.

See: www.mass.gov/orgs/seaport-economic-council-programs-and-grants.

- The Massachusetts Coastal Resilience Grant Program. Executive fund set up to support the rebuilding and protection of Massachusetts coastal communities due to coastal storms and sea level rise. Includes monies for the evaluation of socioeconomic impacts and advance local efforts to combat sea level rise and related coastal flooding and erosion.
- Massachusetts Coastal Zone Management (CZM) Grants to address sea level rise and coastal flooding and erosion.
- Massachusetts Marine Fisheries Grants for public infrastructure. Grants are provided for the fishing industry and public boat launch, public fishing, and public waterfront uses related to fisheries. Grants are provided to Cities, Towns, communities, and public entities within the Commonwealth.
- Massachusetts Grants to Cities and Towns. General grant funds to be provided for the economic development and stimulus of communities within the Commonwealth of Massachusetts. Revolving fund with local grant match requirements.

Federal Grant Programs:

Target sources of Funding from the Federal Government:

- National Fish and Wildlife Foundation (NFWF) Grant Program. Funds open to coastal and or inland waterway communities for the development and preservation of habitat and sustaining wildlife. Funds are provided for projects that advance the NFWF goals of sustaining fish wildlife plants and their habitats for current and future generations. Historically, funds have been utilized to repair coastal areas after storms and to create natural and resilient coastal environments.

See: www.nfwf.org/grants

- Infrastructure for Rebuilding America (INFRA) Grant. INFRA Grant provides dedicated discretionary funding for projects that address critical issues facing our nations' infrastructure. Grants provided to public entities (Cities, Towns, Counties, and Municipalities) for the redevelopment of critical infrastructure and the development of new infrastructure that promotes economic, environmental, and social benefits to the nations' residents.

See: www.transportation.gov/buildamerica/financing/infra-grants/infrastructure-rebuilding-america.

- Build Discretionary Grants (Build Grants). Provides unique opportunity to invest in road, rail, transit, and ports projects that promise to achieve national objects (previously known as TIGER Grant). Congress has dedicated nearly \$8 billion for 11 rounds of national infrastructure investment that have local impact. Monies can be used to improve coastal and port and harbor infrastructure.

See: www.transportation.gov/buildgrants/build-nofo

- Federal Port Infrastructure Development Program (aka: MARAD). Federal program to provide grant funds to communities that have active waterfront, harbor, and port facilities that contribute to the economic and social fabric of those local communities.

See: www.Maritime.DOT.gov/ports/port-infrastructure-development-program

- Federal Economic Development Administration (EDA) Grants. Provides grant funds to eligible entities for local and regional innovation that supports the development strategies to advance new ideas and creative approaches for economic prosperity in communities. Focus is on the creation and retention of workforce development opportunities and the promotion of local businesses.

See: www.eda.gov/funding-opportunities/

APPENDIX F

CLIMATE CHANGE

Coastal Damage is a Universal Issue.

Based on historical and recent trends, as well as models and an overwhelming amount of temporal data, the scientific and engineering communities of the world have come to the conclusion that one of the leading issues that societies will face over the coming decades is that of Climate Change induced weather events. Projections indicate that as much of 90% of coastal areas, representing over 15% of the earth's surface, is at risk from serious coastal damage. And the damage is not constricted to the immediate coastlines. Many coastal areas lie adjacent to low upland areas that are tied to the coastline and equally vulnerable to damage.

Climate change is likely to accelerate the historical rise in sea level through warming of oceans and melting of ice, which in turn will affect coastal development, wetland resources, and recreation along the U.S. coast. The impacts of sea-level rise will occur in coastal areas that are continually evolving and already face a wide range of natural and human-induced stresses, including erosion, storms, land subsidence, wetland loss, and environmental degradation from recreation and development pressures. Responses to sea-level rise at the national, state, and local level must therefore reflect an understanding of the complex interactions of human and ecological systems in coastal areas. In this report, we review the state of understanding of the impacts of sea-level rise on U.S. coasts. (Neuman, J.E., et al, 2000).

Impact assessment for sea-level rise requires careful assessment of local conditions, the magnitude and uncertainties of global sea-level rise, and the costs and feasibility of response options. Important local conditions include coastal topography, geology, and economic and demographic factors. The areas in the United States most vulnerable to sea-level rise are in the north-Atlantic, mid-Atlantic, and south-Atlantic states (because of their low-lying topography, high economic value, and relatively high storm frequency), and along the Gulf Coast (because of low-lying topography and rapid land subsidence). In particular, parts of New England are at high risk, particularly coastal lands and islands in southern and central New England.

Existing threats to coasts that may be increased by climate change include: gradual sea-level rise, catastrophic sea-level rise (i.e., Antarctic ice sheet melt), and changes in storm frequency or intensity. Impact assessments have focused on the first threat, with some consideration in recent studies of the effect of storms on development and redevelopment patterns in the coastal zone. Research on the effects of climate change on storm frequency and intensity is active and results are indicating that trends point toward a link between Climate variation and severity and frequency of storm activity.

The impacts of sea-level rise will vary by location and depend on a range of biophysical characteristics and socioeconomic factors, including human response. The primary impacts of sea-level rise are physical changes to the environment. These changes, in turn, affect human uses of the coast such as tourism, settlement, shipping, commercial and recreational fishing, agriculture, and wildlife viewing. The most serious physical impacts of gradual sea-level rise on coastal lowlands are (1) inundation and displacement of wetlands and lowlands; (2) coastal erosion; (3) increased vulnerability to coastal storm damage and flooding; and (4) salinization of surface water and groundwater.

National assessments suggest that a one-meter rise in global sea levels could have significant impacts, including the inundation of about 35,000 square kilometers (km²) (13,000 square miles (mi²)) of land, divided about equally between wetlands and upland. In addition, the 100-year coastal flood plain could increase by 38 percent, or at least 18,000 km² (7,000 mi²). Estimates of land inundated if global sea levels rise 0.5 meter are closer to 24,000 km² (9,000 mi²). Major coastal cities such as New Orleans, Miami, New York, and Washington, DC, will have to upgrade flood defenses and drainage systems or risk adverse consequences. All coastal communities will need to incorporate resiliency solutions to upgrade for storm and flood damage due to coastal inundation and coastal storms.

Three options have been proposed to respond to coastal threats: planned retreat, accommodation, and protection. Impact and adaptation assessments evaluate where these responses might be implemented and then calculate the costs of implementation and the damages to resources that are not protected. Generally, property losses or the costs to protect property dominate the existing impact estimates for the United States. The implications of lost wetlands, which are not reflected in most current impact estimates, could also be significant. Based on a review of the existing literature, estimates of the cumulative impacts of a 50-cm sea-level rise by 2100 on coastal property in the northeast U.S. (NY through New England) range from about \$20 billion to about \$150 billion. Estimates at the low end of the range reflect modeling of the most economically efficient adaptation to sea-level rise. Those estimates at the high end reflect assessments of vulnerability or protection costs and assume that all currently developed vulnerable areas will be protected, regardless of costs.

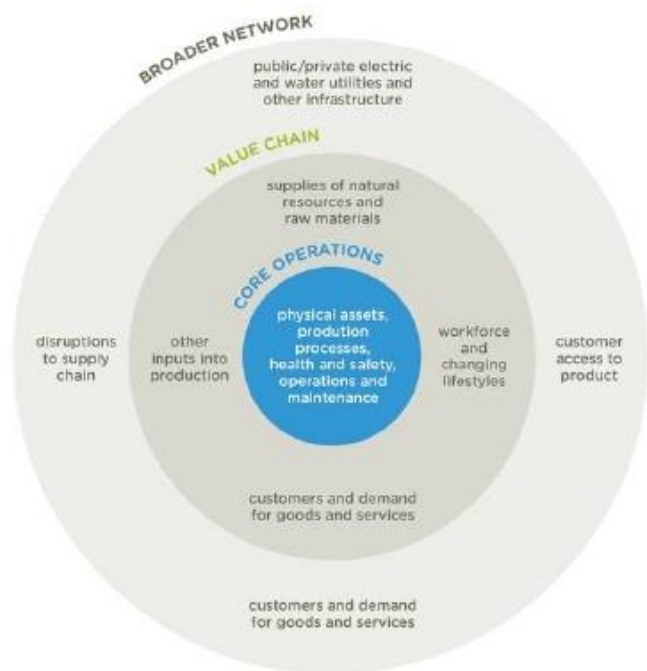


Figure F-1. Impacts to the Economic Value Chain from Coastal Impacts of Climate Change. (Source: Ramboll Publications, Climate Adaptability and Resiliency).

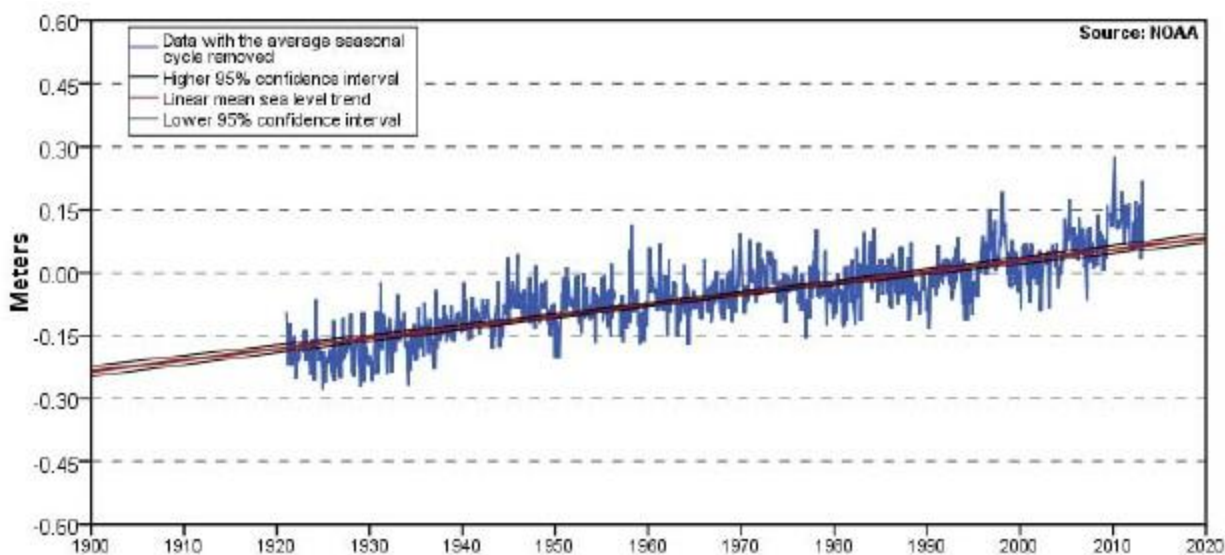
While these cumulative costs are a relatively significant percentage of total property values in the coastal zone, these aggregate estimates do not reflect the potentially large effects on coastal wetlands and, perhaps more important, provide no information on the distribution of impacts. Depending on the policy options chosen to respond to sea-level rise, the impact of rising seas could fall disproportionately on a small number of people or communities in the most vulnerable areas.

Climate change constitutes a cost for the entire economic value chain everywhere in the world. The growing scarcity of water and raw materials, rising sea levels, extreme climate events and rapidly shrinking biodiversity pose challenges for companies around the world (Figure F-1).

Massachusetts Impacts. Massachusetts is one of the coastal areas within the U.S. that has significant coastal vulnerability issues. The Massachusetts Emergency Management Agency (MEMA) has ongoing warnings of coastal and near-coastal flooding and storm damage. The State has officially launched a Resiliency and Vulnerability program and works with affected communities throughout the Commonwealth to both respond to, and better prepare for disasters such as coastal storms and severe weather and tidal events.

Mass.gov general announcement concerning hurricanes and significant coastal storms:

“Although the Atlantic Hurricane Season is officially June through November 30, the most active time in Massachusetts is late August through September. Hurricanes and tropical storms have the power to cause widespread devastation, affecting both coastal and inland areas.” (*Mass.gov/MEMA*).



Graph F-1: Mean sea level trends for NOAA's Massachusetts tide gauge stations.

Massachusetts coastal communities regularly face impacts associated with storm damage, flooding, and erosion, which affect residential and commercial development, infrastructure and critical facilities, and natural resources and ecosystems. Sea level rise will exacerbate these problems, and as the rate of rise accelerates, not only will the impacts from coastal storm events become more frequent and widespread, but even daily high tides will have adverse effects (see Graph F-1 for sea level rise trends from NOAA tide gauge data). Advances in and applications of science, modeling, and other technical approaches can support efforts to begin comprehensive assessment and planning for sea level rise to reduce the risk of current and future coastal flooding.

There is high confidence that the warming atmosphere associated with global climate change is expected to accelerate both the thermal expansion of seawater and the melting of glaciers and ice sheets and will lead to increasing rates of sea level rise (Parris et al., 2012). As relative sea level rises, high water elevations will move landward, areas of coastal shorelines will retreat, and low-lying areas will be increasingly exposed to erosion, tidal inundation, and coastal storm flooding. Developed parts of the coast are especially vulnerable because of the presence of

infrastructure, homes, and businesses that can be damaged or destroyed by coastal storms. In addition, development often impedes the ability of natural coastal systems to buffer inland areas from storm damage, further exacerbating the problem (Burkett and Davidson, 2012). Many coastal habitats are also vulnerable to rising sea levels, including salt marshes, beaches and dune systems, and floodplains, because they are generally at or within a few feet of existing sea elevations. These areas provide significant environmental benefits, including habitat value, filtering of pollutants for improved water quality, protection of inland areas from flooding and storm surge, and extensive recreational opportunities.

Table F-1: Location and parameters from select Massachusetts Tide Gauge Stations:

Station	Mean sea level trend and 95% confidence interval		Period	Century rate (feet/100 years)
	(millimeter/year)	(inch/year)		
Boston, MA	2.79 ± 0.17	0.11 ± 0.00	1921-2012	0.92
Woods Hole, MA	2.81 ± 0.19	0.11 ± 0.00	1932-2012	0.92
Nantucket, MA	3.52 ± 0.42	0.14 ± 0.01	1965-2012	1.15

Massachusetts:

Tide gauge stations measure the height of water referenced to a horizontal control point, or benchmark, and gauges are used to track and predict tide levels and longer term sea level. Long-term data sets from tide stations have been used to understand local and global sea level trends. The National Oceanic and Atmospheric Administration's (NOAA) Center for Operational Oceanographic Products and Services maintains several tide gauge stations at in across coastal Massachusetts, including long-term stations at Boston, Woods Hole, and Nantucket. Mean sea level trends from these long-term stations are listed in Table F-1 above. Trends from the Boston tide gauge station are shown in Graph F-1 (above) and Figure sF-2 (below).

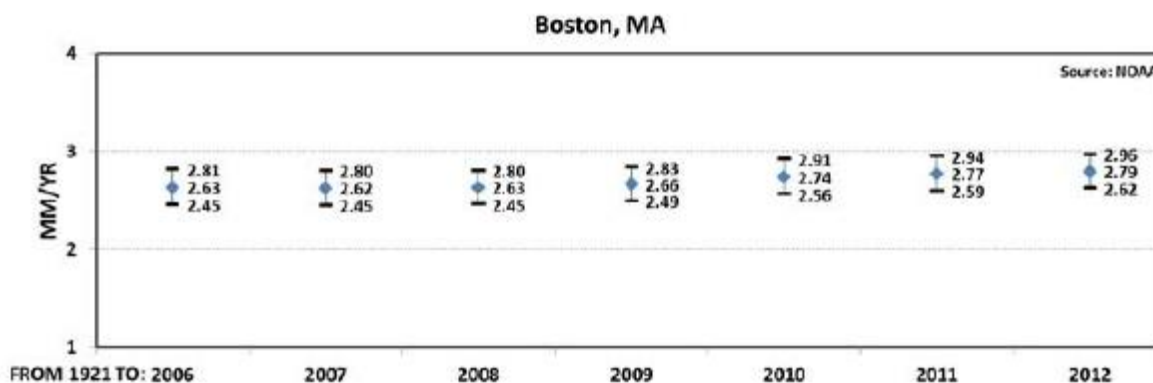


Figure F-

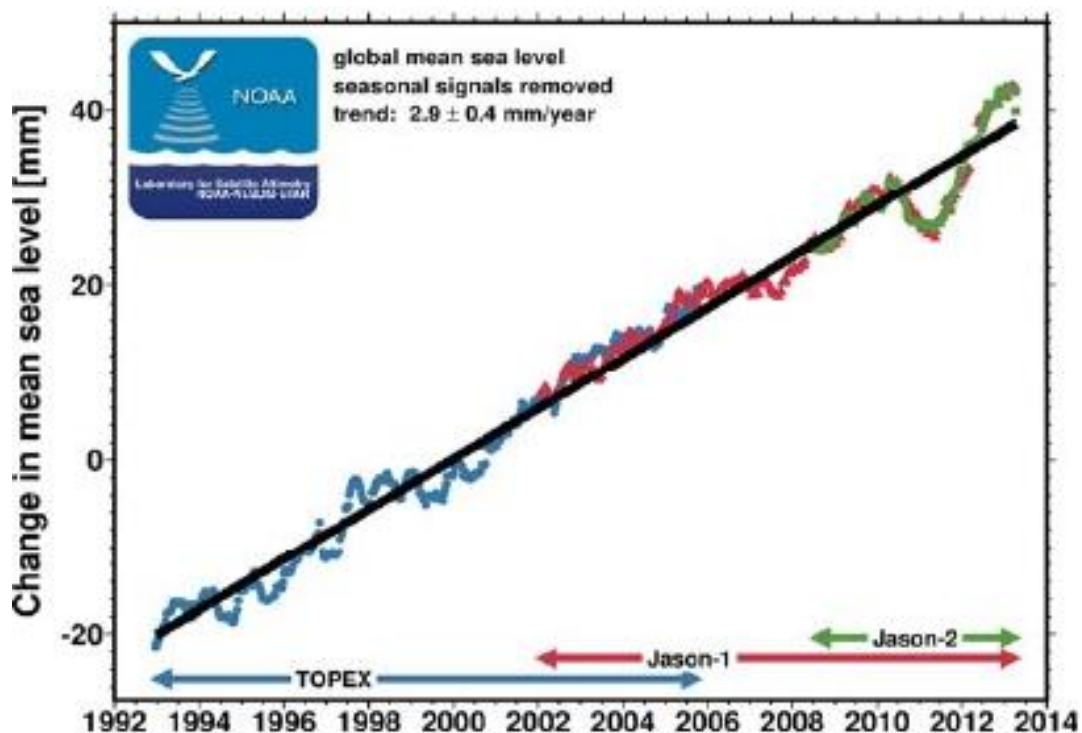
2. Mean sea level rates (blue diamonds) and 95% confidence intervals (in millimeters per year) calculated from 1921 to recent years (2006-2012) at the NOAA Boston tide gauge station. Values are the trend of the entire data period up to that year.

The sea level data recorded by NOAA and other tide gauges produce trends in relation to fixed reference levels on land, and therefore the data from these stations includes variation in local land elevations. The Permanent Service for Mean Sea Level provides sea level data from a global network of tide gauges to support the examination of global sea level rise estimates. Since the late 1800s, global mean sea level rise has been a persistent trend, at a rate of about 1.7 ± 0.2 millimeters per year (mm/yr) as recorded by tide gauges (Church and White, 2011). In addition to networks of local tide gauge stations, direct measurements of global changes in mean sea level are made by highly accurate satellite altimeters. Beginning in 1992, a series of satellite missions has been calculating global mean sea level every 10 days. As shown below in Figure F-3, NOAA's National Environmental Satellite, Data, and Information Service indicates that global mean sea level has risen at a rate of approximately 3.0 mm/yr over the last 20 years. However, due to multi-decadal natural variability in sea level, a 30 or 40 year record is necessary to calculate a representative long-term sea level trend.

Figure F-3.

Estimates of global mean sea level trends based on measurements from satellite altimeters.

Note: TOPEX, Jason-1, and Jason-2 represent satellite missions and observations.



Scenario	SLR by 2100 (m)	SLR by 2100 (ft)	Summary
Highest	2.0	6.6	Highest scenario derived from ocean warming and maximum
Intermediate-High	1.2	3.9	Intermediate-high scenario based on limited ice sheet loss plus ocean warming
Intermediate-Low	0.5	1.6	Intermediate-Low scenario based primarily on sea level rise from ocean warming
Lowest	0.2	0.7	Lowest scenario representing linear extrapolation of historical sea level rise rate derived from tide gauge records

Table F-2. Four scenarios with estimates of global mean sea level rise (SLR) by 2100 as contained in *Global Sea Level Rise Scenarios for the United States National Climate Assessment* (Parris et al., 2012).

Accelerated rates of global, or eustatic, sea level change are driven principally by increases in the volume of the ocean from two primary factors: thermal expansion and melting ice sheets. Steady increases in global atmospheric temperature serve to expand sea water molecules, which increases ocean volume. Increased global temperatures also result in the melting of glaciers and continental ice masses—such as the Greenland ice sheet that covers terrestrial areas, not ice-covered ocean as in the Arctic—which contribute significant amounts of freshwater input to the Earth's oceans.

There is a wide range of estimates for future sea level rise in peer-reviewed scientific literature. Developed with input from national experts in climate science, physical coastal processes, and coastal management, *Global Sea Level Rise Scenarios for the United States National Climate Assessment* (Parris et al., 2012) represents a coordinated approach to synthesize recent scientific literature and develop a consistent set of future global mean sea level rise scenarios. The four scenarios of future global sea level rise in the report provide the basis for the 2013 Draft National Climate Assessment Report. Because of the range of uncertainty in future global mean sea level rise and the difficulties in generating probabilistic projections of sea level rise, the four estimates provided in the report are intended to represent potential future conditions associated with different scenarios of ocean warming and ice sheet melting, or loss. As stated in the report, there is very high confidence (greater than 90%) that the future rise in sea level will be within the range in the scenarios contained in Table F-2 (above) and illustrated in Figure F-4 (below). Most recent data and research indicates that sea level rise of up to 6-feet can be expected by the end of the century.

The four estimates in *Global Sea Level Rise Scenarios for the United States National Climate Assessment* (Parris et al., 2012) reflect several possible future states of ocean warming and ice sheet loss, summarized below in Figure F-4. Source: (Massachusetts Office of Coastal Zone Management (CZM), December 2013; *ebid.* 2017)

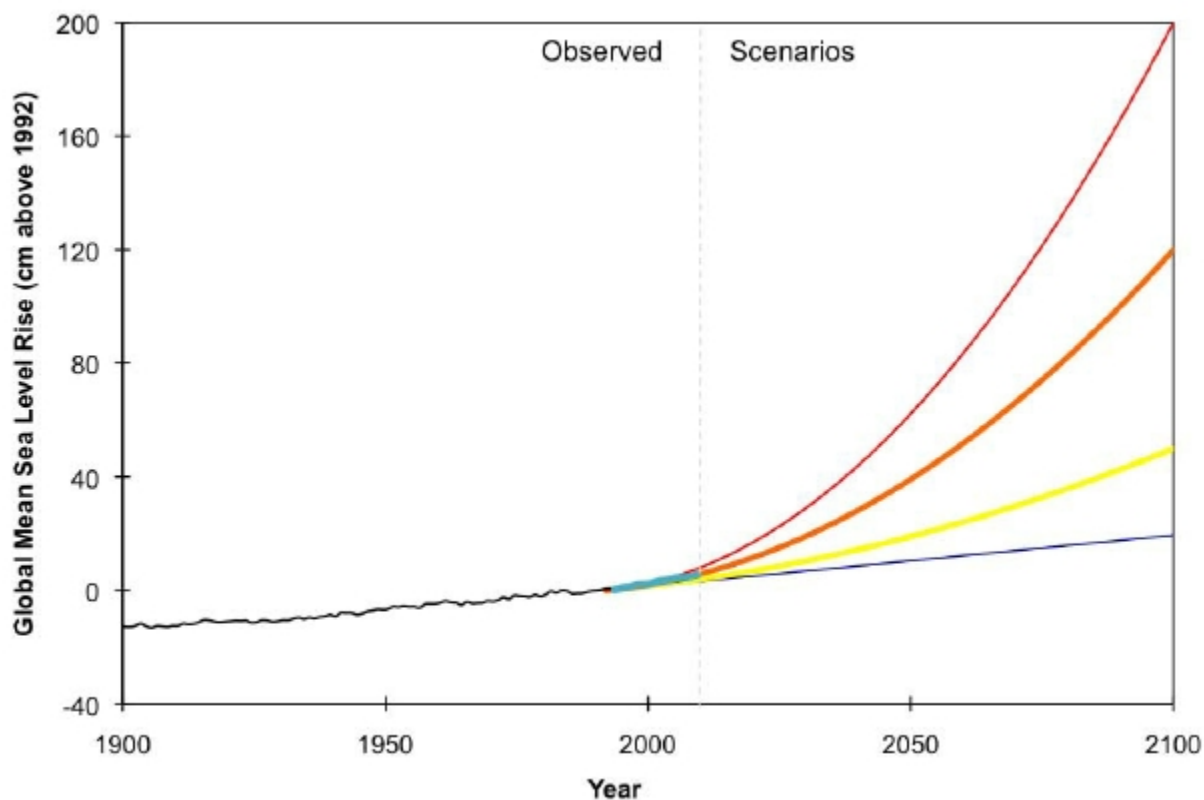


Figure F-4. Four global mean sea level rise scenarios for 1992 to 2100 as contained in the Global Sea Level Rise Scenarios for the United States National Climate Assessment (Parris et al., 2012). 1992 was used as the beginning point for the analysis because it is the midpoint of the National Tidal Data Epoch (NTDE), calculated from 1983 to 2001. To account for variability in sea levels, the 19 year NTDA represents the minimum period for which tide gauge observations can be reduced to obtain mean values.

The Graph in Figure F-4 (above) relates the following four Sea Level Rise Scenarios:

Highest Global Sea Level Rise (Red):

This scenario is derived from a combination of estimated ocean warming from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (2007) and a calculation of the maximum possible glacier and ice sheet loss by the end of the century from Pfeffer et al. (2008).

Intermediate-High Global Sea Level Rise (Orange):

This scenario is based on an average of the high-end, semi-empirical, global sea level rise projections (Grinsted et al., 2009; Horton et al., 2008; Jevrejeva et al., 2010;

Vermeer and Rahmstorf, 2009). These projections use statistical relationships between observed global sea level change, including recent ice sheet loss, and air temperature. The Intermediate-High Scenario provides for risk assessments from sea level rise using only limited ice sheet loss.

Intermediate-Low Global Sea Level Rise (Yellow):

This scenario is based on the upper end of IPCC Fourth Assessment Report global sea level rise projections from the “B1”¹ emissions scenarios. The Intermediate-Low Scenario allows for risk assessment from sea level rise primarily from ocean warming.

Lowest Global Sea Level Rise (Blue):

This scenario is based on a historical (1900-2009) sea level rise rate (1.7 ± 0.2 mm/yr) derived from tide gauge records around the world (Church and White, 2011). Global sea level increased approximately 0.16 meters (m) or 6.2 inches (in) on average from 1900 to 1992, the starting point for the National Climate Assessment projected curves. Based on a linear extrapolation of the historical rate from 1992, approximately 0.2 m (8 in) is anticipated by 2100 (Figure F-4). The rate of global mean sea level rise since 1992 derived from satellite altimetry has been substantially higher (approximately 3 mm/yr), but the period of record is not adequate for projecting century-scale global sea level rise.

