**WATERSHEET**

The word “watersheet” refers to the surface of the water. The term is used when discussing those uses which require access to the watersheet: docks, slips, moorings, and watercraft of all sizes and types. The watersheet in the Cohasset Harbor has a variety of users and vessel types, creating a need to balance the needs of many users in a small area and a short boating season.

Both commercial fishing and recreational boating provide economic value to the Town of Cohasset in terms of fees and property taxes and in their contribution to the overall quality of life for residents in the Town.
COMMERCIAL FISHING

ECONOMIC CONTEXT

The commercial fishing industry has been part of Cohasset since the beginning. A major part of this planning process has been the identification of the needs of the fishermen in order to maintain and grow the fleet. Current facilities are inadequate for the needs of the existing fishing vessels; these inadequacies are a hindrance to either expanding the size of the fleet or encouraging new entrants into the market.

As noted by the FXM report (see Appendix X), commercial fishing in Cohasset Harbor is currently almost exclusively lobstering. Since 2010 both the landings and ex-vessel value of Cohasset’s lobster industry have varied – ranging from nearly 422,462 pounds and almost $1.8 million in value in 2017, to a low of 345,673 pounds and $1.2 million in value in 2012. It is not possible from these data to reliably project longer term trends, but both landings and ex-vessel values have been fairly consistent in recent years as they have been in Plymouth County, a more appropriate comparator for Cohasset’s fishing industry than Norfolk County. The SAFIS Dealer Database reported 26 active harvesters, a 6-year high, and only 4 active dealers, a 10-year low in 2017 as shown in the text table below.

Notwithstanding these variations, local lobstermen report a very stable fishery over the past 10 years and prospects of continuation at least at current catch levels. According to local fishermen, there are currently 19 active boats regularly engaged in commercial lobstersing, providing jobs and income to 40 vessel owners and crew. The contribution of this industry to the economy of Cohasset includes an estimated $760,000 in local spending for goods and services (including the spending of fishermen earnings for local goods and services other than those required to support their businesses). Local resident fishermen also contribute property taxes directly and indirectly to the Town of Cohasset, as well as mooring and dinghy fees and vessel excise taxes totaling about $214,000 annually as shown in the text table below.

Noteworthy in the above table is the relatively low average annual earnings of commercial fishermen in Cohasset – about $24,000 per year compared to an average annual wage of $43,000 for all jobs in Cohasset (see Table 6, page 13).

Local fishermen note an absence of infrastructure investment to support vessel off-loadings, refrigerated storage, and other facilities (the detailed results of conversations/meetings and facility requests of the commercial fishermen in Cohasset are covered in the plan.) Hauling the catch landside at low tide is especially difficult and the lack of lighting and electricity problematic for efficient and safe operations. For the relatively modest investments in physical facilities described elsewhere in the plan, local fishermen estimate that they might increase their catch (and therefore their economic contribution to

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**Cohasset Annual Lobster Landings, Ex-Vessel Value, Effort, and Active Permit Counts, 2010-2017**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>LIVE POUNDS</th>
<th>EX-VESSEL VALUE</th>
<th># OF TRIPS</th>
<th># ACTIVE DEALERS</th>
<th># ACTIVE HARVESTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>492,895</td>
<td>$1,871,089</td>
<td>2295</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>2011</td>
<td>421,861</td>
<td>$1,628,838</td>
<td>2049</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>2012</td>
<td>345,673</td>
<td>$1,207,305</td>
<td>1679</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>2013</td>
<td>378,169</td>
<td>$1,358,563</td>
<td>1689</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>2014</td>
<td>353,623</td>
<td>$1,481,956</td>
<td>1448</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>2015</td>
<td>388,964</td>
<td>$1,757,814</td>
<td>1697</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>2016</td>
<td>441,953</td>
<td>$1,922,849</td>
<td>1744</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>2017</td>
<td>422,462</td>
<td>$1,879,363</td>
<td>1937</td>
<td>4</td>
<td>25</td>
</tr>
</tbody>
</table>

SOURCE: SAFIS Dealer Database

---

1 The latest available data (2017) for commercial finfish and shellfish landings other than Cohasset’s lobster catch for all of Norfolk County was negligible and suppressed in the SAFIS dealer database. A far more robust and diverse commercial fishery is evident in Plymouth County, which includes the ports of Scituate, Duxbury, Hingham, Hull, Marshfield and Kingston. Cohasset commercial vessels landed about 11% of the combined Cohasset and Plymouth County lobster catch in 2017.

2 In 2017 total vessel excise taxes, mooring fees and other receipts to the Town attributable to Cohasset Harbor operations (mostly serving recreational boating) totaled about $153,000. While there is considerable question about the spending of recreational boaters locally, based on estimated statewide per boat averages, the occupants of the 500 recreational vessels moored in Cohasset Harbor could be expected to spend about $500,000 per year on meals, groceries, and miscellaneous items not including boat expenditures such as fuel and maintenance. (source: Recreational Boater Survey, Massachusetts Ocean Partnership, 2010 data updated by CPI).
the Town) by 20-30% as well as sustain a fishery in need of new participants to replace the current aging workforce.

The presence of commercial fishing vessels adds to the attraction of Cohasset Harbor to both residents and visitors, and enhances the prospects of success for local restaurants and other businesses.

TOWN FACILITIES

Commercial fishermen can access the water at either Fisherman’s Wharf on Government Island or the Town Landing (next to Lawrence Wharf).

Fisherman’s Wharf has 18 parking spaces; Town Landing has 3 spaces. Fisherman’s Wharf has approximately 90 feet of dockage but Town Landing can only accommodate a maximum of two vessels at a time.

The facilities are typically small floating timber docks with a gangway access. Neither facility provides a lift system for vessel supply and transfer of bait and catch. The gangways provide split pathways for carts and walking; these pathways are narrow and limit the amount of material that can be transferred at one time.

The Town plans to install a conveyor belt system at Fisherman’s Wharf to provide mechanical transfer of materials between the floats and land. An alternative to this would be a hoist or davit, however this would require boats to approach the site along the seawall where current water depths are not sufficient at lower tides.

The Town plans to restore access to electric power to Town Landing in spring 2019.

INFRASTRUCTURE NEEDS

As noted in the report from GEI Consultants (Appendix X), representatives from the commercial fishermen have identified a number of actions necessary to support the survival and potential expansion of their industry. The fishermen provided this list to the Harbor Committee at its meeting on March 22, 2018.

- Extend and rebuild the pier at Government Island with a conveyor system and hydraulic lift designed

<table>
<thead>
<tr>
<th>Annual Estimated Economic Impact of Cohasset Commercial Fishery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ex-vessel value of the catch (revenues)</strong></td>
</tr>
<tr>
<td><strong>Expenditures (fuel, bait, maintenance, repairs)</strong></td>
</tr>
<tr>
<td><strong>Earnings to fishermen (net of expenditures)</strong></td>
</tr>
<tr>
<td><strong>Average earnings per boat</strong></td>
</tr>
<tr>
<td><strong>Average earnings per fisherman</strong></td>
</tr>
<tr>
<td><strong>Local spending for goods and services</strong></td>
</tr>
<tr>
<td><strong>Property taxes paid by resident fishermen</strong></td>
</tr>
<tr>
<td><strong>Other local taxes attributable to fishermen spending</strong></td>
</tr>
<tr>
<td><strong>Morrison &amp; dinghy fees</strong></td>
</tr>
<tr>
<td><strong>Vessel excise taxes</strong></td>
</tr>
<tr>
<td><strong>Annual fiscal revenues to Town of Cohasset</strong></td>
</tr>
</tbody>
</table>

Sources: 2017 data from SAFIS Dealer Database and Cohasset Town Report; interviews with fishermen; and FXM Associates
to ease the loading and unloading of bait, traps, rope, and equipment necessary for operations. The conveyor system and lift must be usable at all tides.

- Construct a new pier suitable for direct vehicle/vessel loading and unloading between piers at the Cohasset Sailing Club and Parker Avenue.
- Install a designated dinghy dock for commercial mooring holders.
- Reconfigure the floats at Government Island to accommodate more boats.
- Install a marine fueling station on Government Island, with credit card capability.
- Provide water and electric service year-round at all commercial docks.
- Introduction of trash receptacles, dumpsters, and an oil reclamation station.
- Reconfigure Town Landing to include conveyor/hoists and addition of more floats to the NW (towards the inner cove area).
- Add security cameras with live video access via smart phones.
- Create a designated area for bait coolers, usable by all fishermen.
- Create a draft plan detailing future dredging needs
- Undertake a mooring field study to determine if reconfiguration of the mooring fields could create more moorings and moorings for larger vessels.
- Create a Harbor webpage where people can view current communications about and activities in the Harbor.
- Establish specific dates for deployment and retrieval of floats and docks each spring and fall.

**EMERGENCY MANAGEMENT**

The Harbormaster maintains three vessels as part of the emergency fleet. These include a 17 ft. and a 21 ft. work boat and the primary response vessel, which is a 25 ft. Parker Walkaround. The emergency fleet is typically moored in the Harbor and accessed via dinghy because sufficient space is not available at the Government Island Road facility. This arrangement may cause delays in emergency response times, especially in winter months. During these months, emergency response vessels are located on the other side of the Harbor and the Harbor may have ice or other impediments.

While the Harbormaster is either working or are on-call most of the time, the Town may wish to consider additional emergency response vessels for other first responders, including the Police and Fire Departments. The ability to respond to different types of emergencies or multi-jurisdictional emergencies was brought up during the public engagement efforts.

**RECREATIONAL BOATING**

Recreational boating includes Town moorings, organizational use (including, for the purposes of this discussion, the scientific research of the Cohasset Center for Student Coastal Research), and Town facilities for occasional users (as opposed to those who have designated moorings or slips).

**TOWN FACILITIES**

Town facilities include mooring fields, the Town Pier on Margin Street, and the Parker Avenue boat ramp.

- **MOORING FIELDS** The Town has a waiting list of over 500 people for a mooring. Cohasset Harbor has approximately 90 moorings, Cohasset Cove has approximately 30 moorings, and Bailey Creek has approximately 30 moorings. Town Pier: The Town Pier on Margin Street consists of a timber pile supported timber pier and floating docks. The docks are accessed via a ramp at the end of the pier. The pier extends approximately 75 ft into the Harbor and has a “T” at the end providing additional space. The floating docks extend another 40 ft into the Harbor with a “T”-shaped dock system providing space for dinghies. The Margin Street property does not have parking facilities.

- **PARKER AVENUE BOAT RAMP** The Town’s only boat ramp is located at the end of Parker Avenue. Shorelines immediately east and west of the ramp are protected by rip rap. Cohasset Harbor Marina is located east of the ramp and has floats. West of the ramp, a small timber pier supports a gangway and floating docks usually occupied by dinghies used for accessing moored vessels. The ramp is not suitable for use with trailered boats at lower
tides because the bottom of the ramp does not extend far enough below the water surface into the Harbor. The Town is working to redesign this ramp and has hired an engineer to begin the design work.

- **PARKING** The Town offers public parking in several places throughout the Harbor, but general agreement is that not enough parking is available for current uses.

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>PARKING SPACES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Island: Fisherman’s Wharf</td>
<td>18</td>
</tr>
<tr>
<td>Harbor Master</td>
<td>4</td>
</tr>
<tr>
<td>Sailing Club</td>
<td>14</td>
</tr>
<tr>
<td>Back Lot (behind Lighthouse Keepers’ Cottage)</td>
<td>40</td>
</tr>
<tr>
<td>Town Landing</td>
<td>3</td>
</tr>
<tr>
<td>Town Pier</td>
<td>0</td>
</tr>
</tbody>
</table>

On-street parking is available along Border Street.

**COHASSET MARITIME INSTITUTE**

CMI provides rowing and other waterfront activities to the community and uses the Parker Avenue Boat ramp to access the water.

**COHASSET CENTER FOR STUDENT COASTAL RESEARCH**

While not a recreational use, CSCR also uses the Parker Avenue Boat Ramp to access the water. CSCR provides opportunities for students to explore and study the watershed and coastal environment.

**COHASSET YACHT CLUB**

The Cohasset Yacht Club is located on the northwestern shore of the Harbor near the Harbor entrance. The Yacht Club has a pile-supported building and floating dock system providing dockage for approximately 150 boats, including slips, club boats, and dinghy slips. The Yacht Club has a small marine railway to the west that appears to be actively used by the club.

**COHASSET SAILING CLUB**

The Cohasset Sailing Club (CSC) is located at the end of Lighthouse Lane. There is a walking bridge between the CSC and CMI. The CSC is protected by stacked stone seawalls with water access via a ramp to timber floats. Based on aerial imagery the center provides additional dinghy access to boats within the Harbor. The Center has approximately 300 linear ft of available berthing along the floats. The Center’s water access is very limited in width; the channel near the floats is the only access into Bailey’s Cove and is only 80 ft wide. The area immediately outshore of the floats was dredged in 2017 by the USACE.

**COHASSET HARBOR MARINA**

Cohasset Harbor Marina is a private facility located along the southern shore of Bailey Cove. The Marina supports a gangway to provide access to timber floating docks. The facility consists of approximately 750 linear ft of floating docks, which provide 67 slips. Outshore of the Marina, boats are moored within Bailey Cove.

**ATLANTICA**

The Atlantica restaurant has two floating docks that can be used by transient boaters eating at the restaurant.

**PRIVATE DOCKS**

Docks in front of the Olde Salt House (next to the Atlantica) are privately owned dockominiums. Single-family homes in the area (including The Oaks) also have private docks.

**NAVIGATIONAL CHANNELS AND DREDGING**

Cohasset Harbor is accessed via the US Army Corps of Engineers (USACE) channel that runs in a northeast/southwest orientation and is maintained by the USACE.

Cohasset Harbor has been dredged many times since 1903 (see the list in Table X.) In 2017 the USACE performed a survey of the federal project including the entrance channel and basins as part of its Massachusetts
Navigation Projects. Based on the findings, dredging was performed to reduce some shallowed sections of the Harbor and provide safe access into Cohasset Harbor. The project map, at right, identifies the project area for the 2017 dredging effort. The After Dredge/Condition Survey Complete Project Drawings (March 30, 2017) are available here: https://www.nae.usace.army.mil/Portals/74/docs/Navigation/MA/COH/COH132.pdf.

Since the USACE performed the maintenance dredging, the channel and Harbor has experienced minimal siltation. The channel should be monitored for siltation as part of the overall dredge evaluation. The commercial fishermen have indicated a desire for more dredging to support their needs; during the public input process, several people indicated a need for dredging to support both commercial fishing and recreational boating.

ENC Charts from the National Oceanic and Atmospheric Administration (NOAA, 2018) and as seen in Navionics Software (Navionics, 2018) show depths in Cohasset Cove vary greatly. Data show the Harbor has depths of 6-7 ft within the main anchorage and <3 ft in the remainder of the Harbor, including the dredged anchorage near Cohasset Harbor Marina. Some portions are <2 ft deep at low water and therefore unusable by most boat traffic. The Town noted that sediments build in areas around the sewer treatment outflow.

According to the USACE, the Harbor has four anchorages, inclusive of the three anchorages noted above, which are to be dredged to between 6 and 7 ft in depth (USACE, 2018), two of which had dredging performed in 2017. These are the channel outshore of the Cohasset Sailing Center, including a portion of the anchorage to the north, and main Cohasset Channel. While these areas have been deepened to allow vessel traffic, the remainder of the Harbor needs dredging

<table>
<thead>
<tr>
<th>WORK DATES</th>
<th>WORK ACCOMPLISHED</th>
<th>QUANTITIES (CUBIC YARDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May - August 1903</td>
<td>Improvement Dredging of 4-Foot MLW Channel to Point West of Tower Wharf</td>
<td>20,629; plus 105 ledge</td>
</tr>
<tr>
<td>June - July 1960</td>
<td>Improvement Dredging of 8-Foot MLW Channel and 7-Foot Outer Anchorage</td>
<td>157,624</td>
</tr>
<tr>
<td>May 1967 - April 1968</td>
<td>Improvement Dredging of Three Inner Harbor 6-Foot Anchorage Areas</td>
<td>58,200</td>
</tr>
<tr>
<td>May 1967 - May 1968</td>
<td>Maintenance Dredging of 8-Foot Entrance Channel</td>
<td>8,700</td>
</tr>
<tr>
<td>May - July 1978</td>
<td>Maintenance Dredging of 8-Foot Entrance Channel by US Sidecast Dredge Fry</td>
<td>15,000</td>
</tr>
<tr>
<td>September 1998 - February 1999</td>
<td>Maintenance Dredging of 8-Foot Entrance Channel and the 7-Foot and 6-Foot Anchorage Areas</td>
<td>84,000</td>
</tr>
<tr>
<td>November 1999 - February 2000</td>
<td>Continue Maintenance Dredging of 8-Foot Entrance Channel and the 7-Foot and 6-Foot Anchorage Areas</td>
<td>18,500</td>
</tr>
<tr>
<td></td>
<td>Maintenance Dredging of 8-Foot Entrance Channel and the 7-Foot and 6-Foot Anchorage Areas – Partially Completed and Contract Terminated for Nonperformance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintenance Dredging of a High Shoal in the 8-Foot Entrance Channel by US Hopper Dredge Currituck with Placement Nearshore off Green Harbor Beach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete Maintenance Dredging of 8-Foot Entrance Channel and the 7-Foot and 6-Foot Anchorage Areas</td>
<td></td>
</tr>
</tbody>
</table>
to continue to facilitate use of existing infrastructure. The Town would need to request regulatory approvals from the following agencies to perform additional dredging within the Harbor:

- USACE
- MA DEP Ch 91.
- MA DEP Water Quality
- MEPA
- Town Conservation Commission (Notice of Intent)

As part of the permitting process, the Town should review the material testing results with the USACE. This will help understand potential opportunities to secure USACE dredging and disposal approvals.

Disposal options may include upland disposal at landfills, offshore disposal, and beneficial reuse on nearby beaches if materials are clean enough.

**RECOMMENDATIONS FOR THE WATERSHEET**

In addition to the requests from the commercial fishermen noted above, the following recommendations address the concerns brought forward during the public engagement process:

- **MOORING STUDY** Although existing mooring fields are configured to provide sufficient depths for boats in the Harbor, and moorings are generally aligned in a grid pattern...
with minimal overlaps, currents within the Harbor limit the ability to rearrange mooring fields or increase mooring density. A mooring study of the Harbor would help identify potential increases in the number of moorings.

• **MIXED-USE FACILITY** A Town-owned pile supported pier could provide many economic benefits and a balance of commercial and recreational uses. A new facility could provide deeper draft loading abilities with cranes or hoists and convenience utilities including water, power, and sewer in addition to increased dockage and ADA boat access. Major improvements resulting in enlarged structures, increased floats, or mixed-use facilities should be studied further to identify appropriate shapes, sizes, and configurations. To understand if a mixed-use facility may be feasible for Cohasset Harbor, a more detailed analysis of economic impacts would need to be performed. Two potential locations for a mixed-use facility include Government Island and the Town Pier at Border Street. Efforts to secure funding for these facilities could potentially be aided by providing additional emergency response vessels and support to the waterfront.

• **DREDGING STUDY** The Town should undertake a dredging study to evaluate the need for additional dredging to restore historic depth and support both commercial fishing and recreational boating, including potential additional moorings. In the review of soundings from the 2017 survey, approximately 150,000 cy of sediment is needs to be removed to reach the target depths of the federal project with a 1-ft over-dredge.

• **PARKER AVENUE BOAT RAMP** Current plans are to redesign the structure within the same footprint with the potential of expanding the length or modifying the slope to allow use throughout the tidal range. Other improvements may include: widening the ramp, if property ownership lines allow; installing floats along the sides for easier access to boats and vehicles; identifying designated dinghy ramping for CSCR and CMI boats, and dredging the bottom of the ramp to provide sufficient depths at low tides.

• **CONSIDER SEPARATING FACILITIES FOR COMMERCIAL FISHING AND RECREATIONAL BOATING** Some concern was expressed during the public engagement process about safety in the Harbor given the small size and large amount of activity. One suggestions was to formalize the division of resources by separating the infrastructure supporting commercial fishing from that supporting recreational boating. One suggestion was to add facilities between the Cohasset Sailing Club and the Parker Avenue Boat Ramp for commercial fishermen and then dedicate Town Landing to recreational boating. This would require further study to determine the feasibility of access, the depth of the Harbor in that area, the impact on the shoreline, and the ability to provide power and water to the site.
Edges

Edges are where sea and land meet. Hard edges are designed to prevent flooding by creating a barrier or channel. Soft edges are designed to absorb floodwaters and gradually drain water back to the Harbor or allow it to infiltrate into the water table. Both require regular maintenance to ensure the effective protection against high tides and storm surges.

Predictions for sea level rise fall within a range of possibilities. The existing Harbor infrastructure, hard and soft, has already been overwhelmed by high tides and storm surges; the March 2018 storm was a recent example.

Landings and marine railways knit together land and water; they are necessary for the function of the Harbor and may also be endangered by projected conditions.
HARD INFRASTRUCTURE: PILES, PIERS, SEAWALLS, RAILWAYS, AND THE BREAKWATER

A mixture of public and private seawalls provide a hard separation between water and land. Marine railways and piers interact with both land and water. Piles support buildings above the water. The breakwater mitigates the impact of storm surge and wave action on the Harbor. GEI Consultants evaluated the following hard infrastructure as part of the planning process. Please see Appendix X for more details.

• **COHASSET SAILING CLUB** The CSC is protected by stacked stone seawalls. The seawall in front of the building was in satisfactory condition with minor deterioration and some voids observed at the bottom of the wall. The high-water mark appeared to be about 1 ft below the wall. This small amount of freeboard would likely result in overtopping during extreme high tides.

• **MILL RIVER MARINE RAILWAY/ COHASSET LOBSTER POUND** The Mill River Marine Railway facility is located along Border Street on the southern shoreline of Cohasset Harbor, west of the Commercial Pier and rock waterfall. The facility includes the Cohasset Lobster Pound and a small marine railway. While the railway may be usable, it was in poor condition at the time of the site visit. Many of the timber elements below water (exposed at low tide) were cracked or split and no longer function properly. The shoreline along the railway facility is protected by a stone seawall to the north and west, and the east wall consists of rock ledge along the waterfall. The walls were in satisfactory condition and the concrete foundation elements appeared to be in satisfactory condition. There is also a sluice-way under the Mill River building that was previously used for hydro-power. The structure was not evaluated during this project, but inspection should be considered during future improvements of the property.

• **ATLANTICA** The shoreline consists of a variety of construction types including rip rap slope with a seawall, rock ledge, and stacked stone walls. The Atlantica restaurant is supported on pier foundations. At the time of the site visit, the concrete piers and timber pilings were in fair to satisfactory condition. The stacked stone walls exhibited some loss of mortar between stones below the high tide mark. The revetment supporting the parking lot showed evidence of movement and settlement between stones and between the stones and top wall. The parking area exhibited several locations of settlement and voids under the asphalt. There were also several holes in the pavement that appear to warrant immediate repair inshore of the seawalls.

• **OLDE SALT HOUSE** This includes the filled area adjacent to the Town Pier at Border Street. The seawall on the west side of the filled structure had a previous failure and was repaired with a dumped stone slope.

• **TOWN LANDING/ LAWRENCE WHARF** The shoreline for the Town Landing at Border Street consists of a stacked stone seawall. At the time of the site assessment, seawalls in this area were deteriorated with missing mortar and loose stones. The seawall around the gazebo was in better condition, with mortar in place and no loose stones. The east side of the embankment appeared to have a previous wall failure where rip rap had been placed.

• **TOWN PIER/MARGIN STREET** The 75-foot pier was in satisfactory conditions. The Town Pier does not have a seawall.

• **COHASSET YACHT CLUB** The Yacht Club has a pile-supported building. It has a small marine railway to the west that appears to be actively used by the club.

• **GENERAL HARBOR SEAWALLS** Seawalls around the Harbor consist mainly of stacked stone walls. The Border Street seawall was generally in satisfactory condition, however there were several small to large settlement points behind the wall. This had most likely been caused by fine sediments being flushed from
behind the wall. The section behind the wall along Border Street between the Atlantica and Cohasset Harbor Inn was in better condition than the section between the Atlantica and the Mill River Facility. Seawalls around the Town Pier at Border Street were in better condition than the seawall at Border Street, however they are also exhibiting minor material loss and settlement. Opposite the Town Pier at Border Street there was evidence of a seawall failure and dumped stone repair. Based on aerial imagery this was estimated to have occurred in 2017.

- **BREAKWATER** Jetties at the entrance of the Harbor were in satisfactory condition. The top of the jetties was noted to be at the approximate high tide mark, which would allow some waves to proceed over and into the Harbor during storm events. The Harbormaster noted that the jetties are over-topped during high tide events where predicted tides exceed +12 ft, however Town properties do not typically incur damage.

**Incomplete:** awaiting further information on breakwater.
SOFT EDGES: MARSH AND TIDAL FLATS

BENEFITS

• FILTER STORMWATER RUNOFF IMPROVING WATER QUALITY
• HABITAT FOR FLORA AN FAUNA
• SOFTENING VELOCITY

CONDITIONS

• COHASSET YACHT CLUB The shoreline around the Yacht Club is marsh with limited shoreline protection.
• BASSING BEACH

MAINTAINING A HEALTHY ECOSYSTEM

• STORMWATER MANAGEMENT
• SEPTIC SYSTEM FAILURE
• RUNOFF FROM LAWN FERTILIZATION
MassDEP Wetlands - MHP Planning Area

Legend

MASSDEP WETLANDS
- Wooded Marsh
- Marsh/Bog
- Salt Marsh
- Tidal Flats
- Open Water
- Beach/Dune

MAP BASE
- Proposed MHP Boundary
- Parcels
- Town Boundary

Cohasset Municipal Harbor Plan Harriman | FXM | GEI May 2018
FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD ZONES

FEMA determines the boundaries and types of flood zones. In Cohasset Harbor, the FEMA flood zones include the VE zone (which is a velocity zone and indicates a greater potential for damage from wave-related action), the AE zone (1% annual chance of flooding) and the X zone (0.2% chance of annual flooding). The 1% annual chance of flooding is popularly called the 100-year storm; with the increasing number and intensity of precipitation events, the 100-year storm may occur on a much more frequent basis.

MVP PROGRAM

The Town of Cohasset participated in the Commonwealth of Massachusetts Municipal Vulnerability Preparedness (MVP) Program. Governor Charlie Baker signed Executive Order 569 in 2016, instructing the Secretary of Energy and Environmental Affairs and the Secretary of Public Safety to coordinate efforts across the Commonwealth to strengthen the resilience of our communities, prepare for the impacts of climate change, and to prepare for and mitigate damage from extreme weather events, including establishing a framework for municipalities to complete climate change vulnerability assessments and resiliency action plans.

The Commonwealth’s Municipal Vulnerability Preparedness (MVP) grant program provides funding to municipalities to conduct vulnerability assessments and develop action-oriented resiliency plans. Implementation funding is available to those communities who have achieved certification as an MVP community.

The Metropolitan Area Planning Council (MAPC) worked with the Town of Cohasset to facilitate the MVP process. This process is a high-level look by members of the community at the impacts of climate change, which include (among other issues) impacts from an increased number of days over 90 degrees, the increase in the number and severity of precipitation events, and the impacts of sea level rise on both daily tides and storm events.

The call-out box to the right contains the results from this planning process that are related to Cohasset
FLOODING DAYS

In addition to the work completed during the MVP process, GEI Consultants undertook a more in-depth look at the impacts of sea level rise, and, in particular, in the shifting patterns of flooding days. Please see Appendix X for the detailed methodology and conclusions in this report. The patterns of flooding days and how those are impacted by the range of sea level rise scenarios: sea level rise alone in varying scenarios, sea level rise plus high tide, sea level rise plus storm surge, and sea level rise plus high tide plus storm surge are critical to understanding the implications for uses, buildings, infrastructure, and the soft edges in the Harbor. Existing sea walls may be overwhelmed, salt marshes may not have sufficient absorption capability, buildings may be damaged on a more regular basis. Understanding the ranges for the frequency and height of floods provides information that is crucial when evaluating repairs to buildings and infrastructure, the placement and construction of new buildings and infrastructure, or the health of the creeks, rivers, and salt marshes in absorbing the impact of flooding without creating additional risk to properties upstream from the Harbor.

This report looks at the risk of flooding over 5 feet in any single-year and the risk of flooding over 5 feet in a group of multiple years at four scenarios of sea level rise: slow rise, medium rise, fast rise and extreme rise. The conclusion is that the risk of a 5-foot flood will continue to increase both in any given year (10% by 2080 under a slow rise scenario) and in any group of years (there is approximately 18% chance of a 5-foot storm between 2016 and 2030).

The report from GEI Consultants provides a series of analyses whereby the increase in the water level is estimated from 2020 to 2120 under the four sea level rise scenarios. Each of these is further modified by adding two further levels of analysis: the addition of a moderate flood to each of the scenarios and the addition of a major flood.

RECOMMENDATIONS FOR THE EDGES

The edges protect more than just Cohasset Harbor;

- **UNDERTAKE A HAZARD MITIGATION PLAN** Because of the interrelationship between the soft edges of the Harbor and the remainder of Cohasset, sea level rise and increased precipitation events will have an impact on more than just the Harbor. A hazard mitigation plan will integrate the findings from the MVP process and from this Municipal Harbor Plan into an implementation plan that addresses the entire Town.

- **CREATE AN EDUCATION PROGRAM** This program should educate residents about the impact of stormwater runoff on the health of the Harbor, identifying actions such as the proper disposal of dog waste, the need to mitigate stormwater onsite, the impact of runoff from lawn fertilizers into the Harbor, and the impact on run-off from failing septic systems.

- **EVALUATE SEAWALLS** All seawalls should be evaluated as part of an overall study on suitability of the existing Harbor infrastructure for protection against sea level rise and storm surge event.

- **REPAIR SEAWALLS** Several seawalls in the Harbor need repair to limit further deterioration of roadways behind them. An investigation of the cause of damage should be considered to stop or minimize the future deterioration.

- **EVALUATE THE HEALTH OF THE SALT MARSHES AND BASSING BEACH** These act as critical absorption and buffer systems, respectively. Ensuring that these systems are maintained is as important as repairs to the infrastructure in terms of preventing additional flood damage upstream.

- **CONSIDER HYDROLOGICAL MODELING OF THE HARBOR** This model would look at impacts on specific sites at the parcel level, rather than the high-level view provided by the MassGIS data in Figure X.
• **ADOPT REGULATORY CHANGES** The Town’s zoning ordinance should consider addressing resiliency measures to either prevent or mitigate the impact of flooding on new development in the Harbor. Such changes could range from allowing the maximum height to be from Base Flood Elevation (BFE) to the addition on a Flood Fringe District which addresses development standards along the edges of the FEMA Flood Zones, understanding that those may change over time.

• **CONSIDER INCENTIVES** Such incentives could include the reduction of permitting fees, density bonuses (where appropriate), waivers of local regulatory restrictions, small grants, and other options to include innovative flood resiliency and/or adaptation measures to enhance the resiliency of the Harbor and the land. Resiliency measures may include energy-efficient design, use of alternative energy sources, locating generators on the roof or upper stories, locating utilities underground, flood-proofing electrical transformers, and moving mechanical, electrical and HVAC equipment to upper stories.