CAMDEN HARBOR RESILIENCE PLANNING

SUMMARY REPORT
Town of Camden, ME

Richardson and Associates
WSP Engineering

APRIL 18, 2025

This report was prepared by THE GRANTEE under award CZM NA22NOS4190151 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the authors) and do not necessarily reflect the views of the National Oceanic and Atmospheric Administration or the Department of Commerce.
Funding for this project was also provided by a Community Action Grant made possible by the State of Maine's Community Resilience Partnership.

PROJECT OVERVIEW

Camden's Inner Harbor: A Vision for Coastal Resilience

Project Background

In the wake of the January 2024 coastal storms, the Town of Camden, Maine, proactively developed a harbor-wide flood resilience plan for its inner harbor. This plan assessed flood risk and outlined strategies to enhance the community's resilience to rising sea levels and increasingly intense storms. Thanks to a Community Action Grant from the State of Maine's Community Resilience Partnership and a Shore and Harbor Planning Grant from the Maine Coastal Program, this vital initiative was supported. The town collaborated closely with CamdenCAN, a local organization, to ensure a community-driven approach that integrated social, ecological, and economic sustainability with flood resilience.

About Camden

Camden, Maine, is a beautiful and industrious coastal town spanning nearly 20 square miles of land and water, with over six miles of shoreline along Penobscot Bay. Our year-round population of 5,287 swells during the summer season, nearly tripling in size. Camden operates under a Select Board, Town Manager, and Town Meeting form of government. Our vibrant inner harbor and a portion of the outer harbor support a thriving working waterfront, which is a key economic engine for our community.

Our Path to Resilience

The Town of Camden had diligently maintained and repaired town-owned properties, such as the Town Landing and Harbor Park, in response to flood damage. Private property owners had also been actively engaged in similar efforts. Recognizing the increasing impacts of sea-level rise, storm surge, and flooding, the town transitioned from reactive repairs to proactive resilience planning.

In summer 2024, the Select Board awarded a contract to Richardson & Associates/WSP to develop a comprehensive harbor resilience road map in partnership with the Camden community. This road map utilized existing sea-level rise (SLR) mapping projections to help property owners understand and plan for potential risks. The goal was to create an inspiring vision that addressed flood concerns through multi-benefit solutions, enhancing the community in the process. This report summarized the collaborative process and strategies developed with input from residents, officials, and business owners.

Understanding Our Options

The recommendations and strategies in this report are presented as options and opportunities, not mandates. We aim to provide the Town and private property owners with a range of alternatives, along with flood maps, to inform future investments. These recommendations include both physical adaptation measures and policy considerations, all designed to guide Camden toward a more resilient and vibrant future.

Building resilience means embracing change strategically. While we cannot maintain the status quo in the face of rising sea levels, neither is it feasible nor desirable to abandon our working waterfront, ecological assets and cultural pillars. This plan seeks a balance: protecting what we cherish while adapting to inevitable changes. Flood projections indicate that without action, our inner harbor as we understand it today could be largely unrecognizable by 2100. By acting now, we can shape that change and enhance the waterfront that is the heart of our community, our economy, and a critical ecological asset.

Looking Ahead

This plan aligns with Maine's "Maine Won't Wait" policy, which focuses on key milestones in 2030, 2050, and 2100. Recognizing the uncertainty of long-term projections, this resilience road map is designed to be flexible and adaptable. It identifies near-term, mid-term, and long-term measures, as well as triggers for implementation. We envision this plan as a valuable resource for our community for years to come. At the same time, we understand that there is no end in sight to climate change without change to the root cause.

Acknowledgments

We extend our sincere gratitude to everyone who has contributed to this process. This initiative would not have been possible without the guidance of Jeremy Martin, the unwavering support of CamdenCAN, the engagement of Camden Library Executive Director Kristy Kilfoyle and Library Trustees, the valuable feedback from all participants, and the expertise of Pete Slovinksky of the Maine Geological Survey.

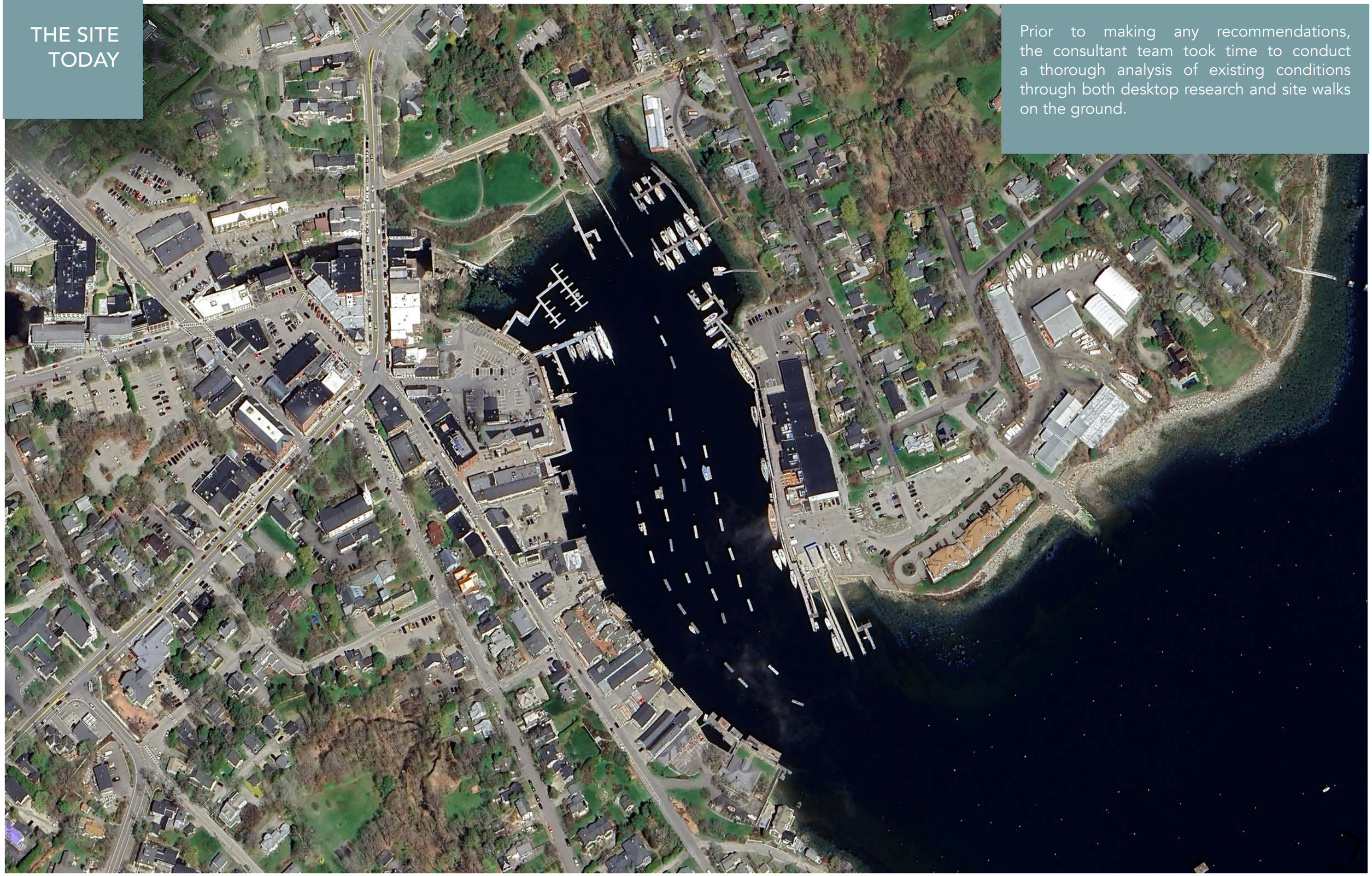
Next Steps

We will prioritize near-term projects and seek opportunities to develop detailed designs in partnership with business operators, landowners, and town officials. We are confident that the Camden community, our local engineers and designers, and Maine's second-to-non makers are ready to meet this challenge in a manner that will set the bar. Together, we can create a more resilient and thriving future for Camden's inner harbor.

SITE ANALYSIS

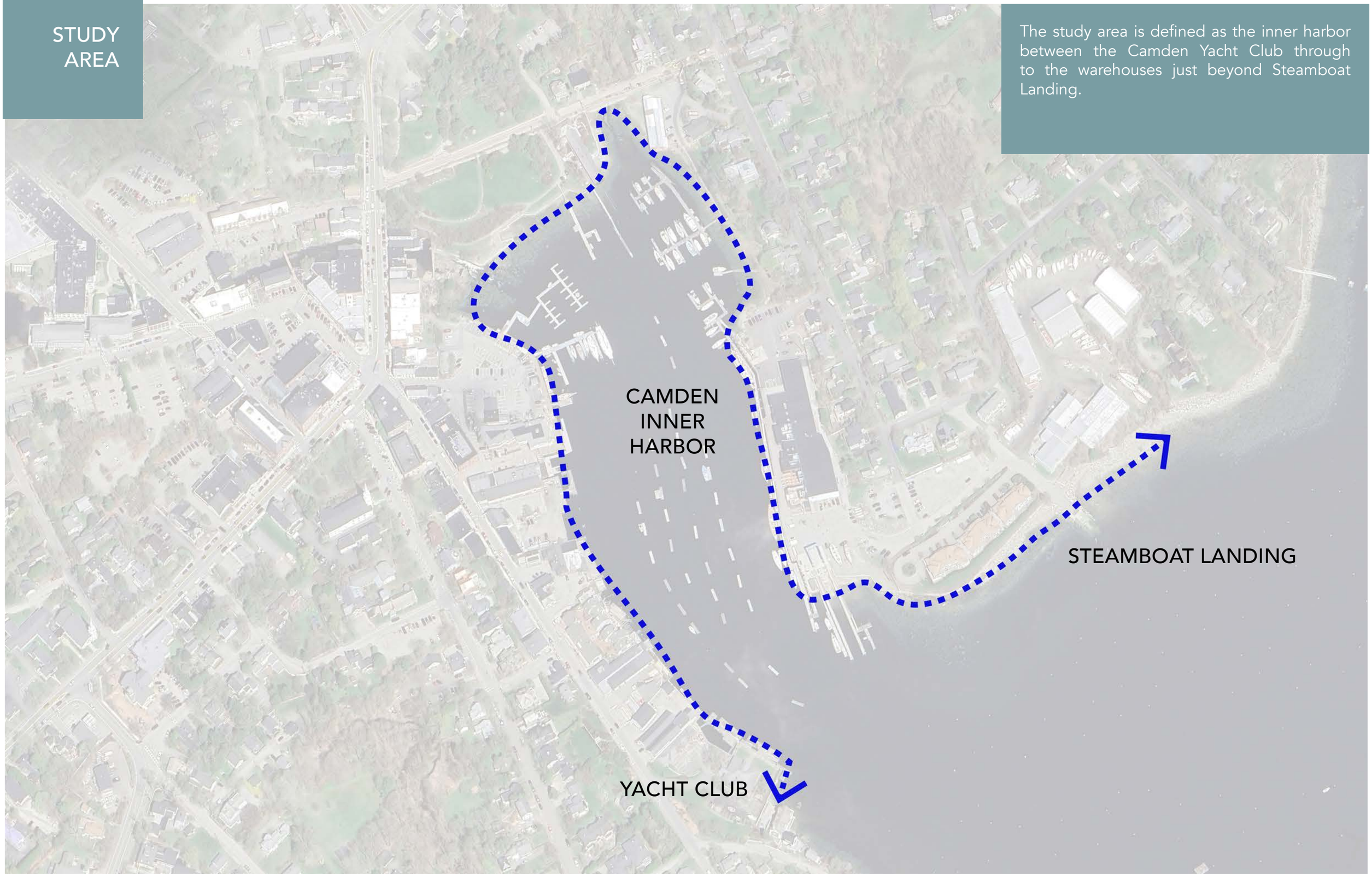
THE SITE TODAY

Prior to making any recommendations, the consultant team took time to conduct a thorough analysis of existing conditions through both desktop research and site walks on the ground.



STUDY AREA

The study area is defined as the inner harbor between the Camden Yacht Club through to the warehouses just beyond Steamboat Landing.



HISTORIC CONDITIONS

The site assessment began by looking into the historic conditions of this location. Over time, Camden's inner harbor has transformed from a shallow wetland ecosystem to a more developed place of commercial and recreational activity. Without these natural defenses in place, assets along the shore are more at risk to storm and flood damage today.

HISTORIC PHOTO

1864 US Coast Guard Map

PUBLIC LANDS

Only a fraction of the properties abutting the inner harbor are publicly owned land. These include the site of the Camden Yacht Club, the Town Landing, Harbor Park and Steamboat Landing. In addition, the Town does own additional parcels nearby that include municipal buildings, public open space, parking lots and other assets.

PEDESTRIAN NETWORK

The pedestrian network around the inner harbor spans public property as well as privately held publicly accessible areas such as the wharf at Lyman-Morse. While there is some waterfront access today, most of the waterfront is inaccessible to the public. Bicycle networks are limited to the public ROW but there is an opportunity to improve safety and connectivity for multi-modal networks through public private partnerships.

VEHICULAR ACCESS & PARKING

Much of the undeveloped land around the inner harbor is used for surface parking, road networks and access drives. The majority of these areas are paved with impervious asphalt surfaces that prevent local storm water infiltration and generate storm water runoff that contributes to inland flooding and degradation of water quality when untreated.

PUBLIC PARKS

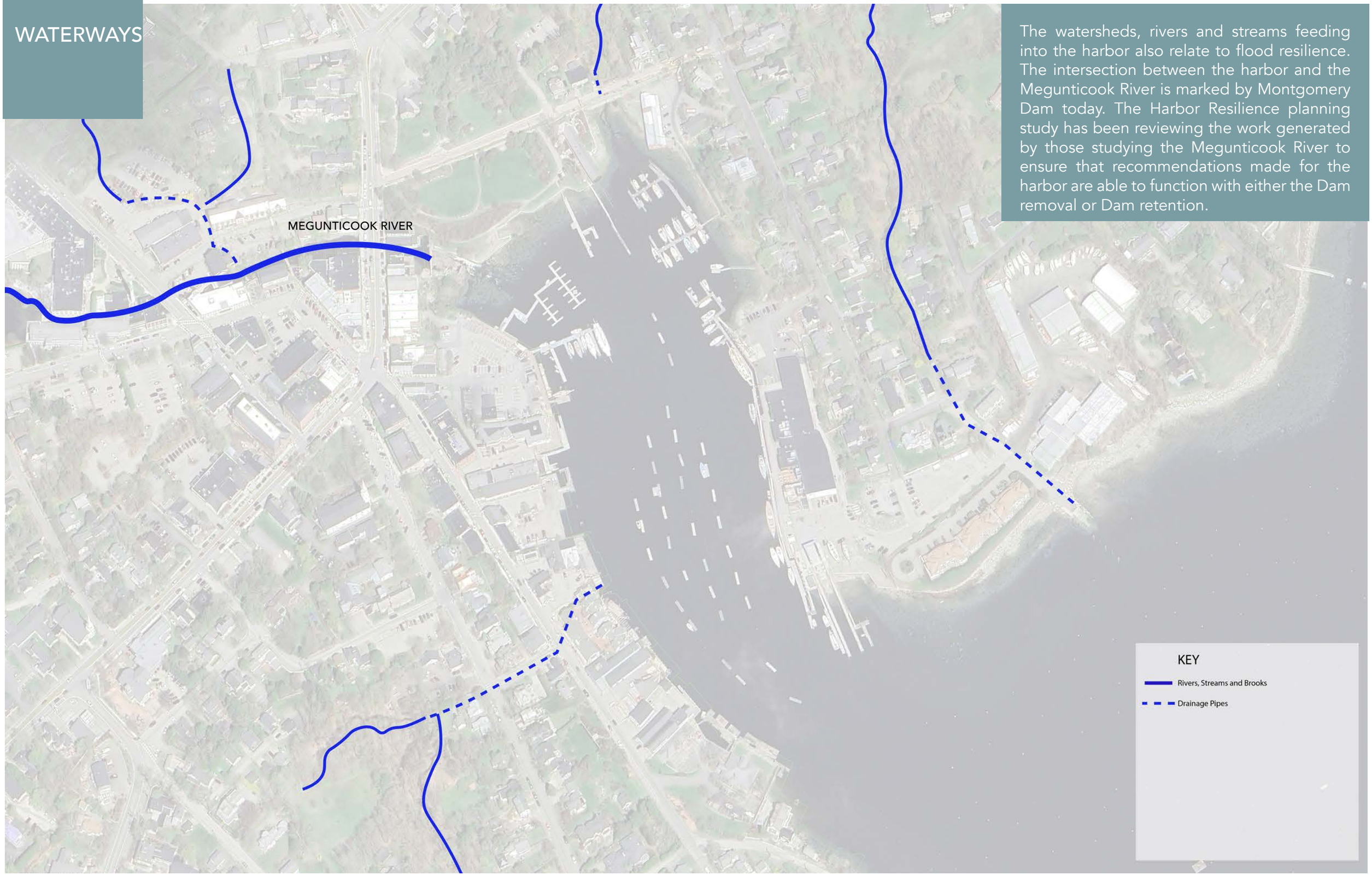
Green "patches" of public open space are present thanks to the generous philanthropic support of Mary Louise Curtis Bok. These parks are cornerstones of the community that support ecological function, the arts, recreation, education and public access. Harbor Park is impacted by flooding today and the Library leadership has joined in this process to explore potential resilient measures that honor the park legacy in a sustainable manner.

KEY

Parks and Open Space

WATERWAYS

The watersheds, rivers and streams feeding into the harbor also relate to flood resilience. The intersection between the harbor and the Megunticook River is marked by Montgomery Dam today. The Harbor Resilience planning study has been reviewing the work generated by those studying the Megunticook River to ensure that recommendations made for the harbor are able to function with either the Dam removal or Dam retention.

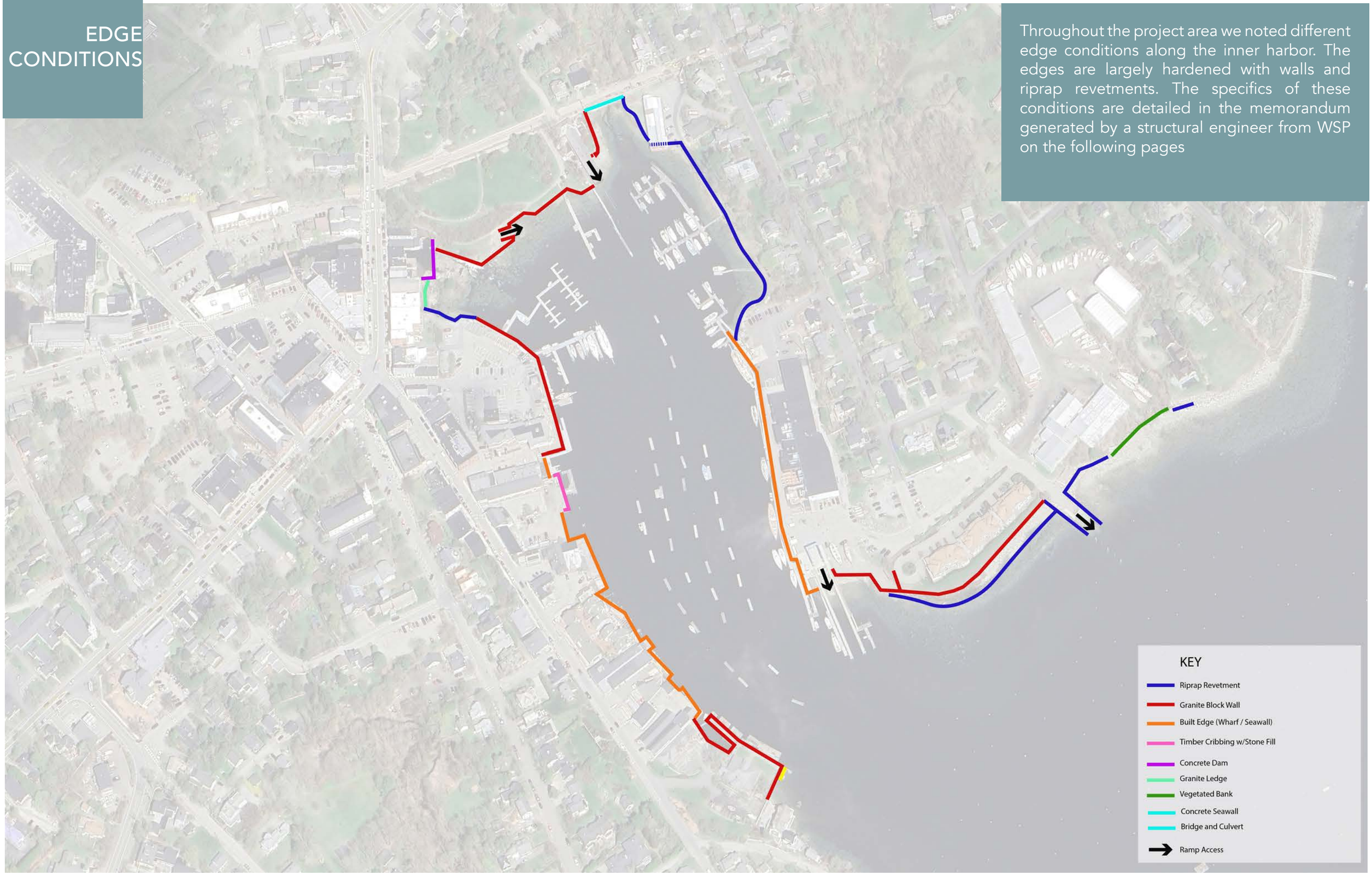


INFRA NETWORK

The infrastructure network located proximate to the inner harbor was mapped to understand points of vulnerability relative to flood risk. The two pump stations on either end of the harbor are critical facilities that require careful attention to ensure that the broader network is operational.

EDGE CONDITIONS

Throughout the project area we noted different edge conditions along the inner harbor. The edges are largely hardened with walls and riprap revetments. The specifics of these conditions are detailed in the memorandum generated by a structural engineer from WSP on the following pages



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MEMO

TO: Blake Sanborn, Richardson & Associates

FROM: Jackson Coyle & Todd Coffin, WSP USA

SUBJECT: Camden Harbor Resilience Planning, Harbor Reconnaissance and Flood Planning Tools

DATE: October 14, 2024

WSP USA Environment & Infrastructure Inc. (WSP), is pleased to provide this memorandum on observations made by WSP Ports and Marine engineer, Jackson Coyle, during reconnaissance of Camden Harbor on September 19, 2024. In addition, the memorandum provides flood planning tools prepared after the site visit. These tools include projected flood scenarios that consider sea level rise and water level elevations for a various SLR and high tide scenarios (refer to Section 4.0).

The objective of the reconnaissance was to observe the harbor's shoreline, structures, and related land use, with emphasis on vulnerability to storms and evidence of impact. The area of reconnaissance extended from the Camden Yacht Club on the southwest side of the harbor to Steamboat Landing on the southeast side of the harbor. WSP was accompanied by Todd Richardson and Blake Sanborn of Richardson & Associates and Jeremy Martin, Planning and Economic Development Director for the Town of Camden.

2.0 SITE CHARACTERIZATION

Camden's inner harbor and a portion of the outer harbor is a working waterfront consisting of public and private land with a mix of commercial, recreational, and residential use. The inner harbor is generally well protected from wind and waves except in extreme storm conditions. During storm events, storm surge and associated waves increase the water level above the normal tidal elevations which can cause inundation flooding, especially if the storm coincides with a high tide. The harbor's developed waterfront elevation in many areas, especially along the north and east sides of the harbor, is just above the high tide line which make it susceptible to inundation during storm events and astronomical high tides.

3.0 OBSERVATIONS & FINDINGS

For this memo, the harbor was divided into four reaches: East Harbor, North Harbor, West Harbor, and the Steamboat Landing reach (refer to **Figure 1**). The observed harbor waterfront consists of riprap revetment, vegetated bank, granite key wall, timber pile supported wharf, a concrete dam, granite ledge, and a concrete seawall. On the day of our site visit on September 19, 2024, beginning at 9:00 AM, low tide was at 6:07 AM with an elevation of -1.3 ft and high tide was at 12:19 PM with a elevation of 11.9 ft. The tide height is measured in relation to the tide chart datum (lowest astronomical tide level).

WSP evaluated accessible waterfront public land and private property with permission (e.g., Lyman Morse boat yard and marina), or from public rights-of-way; a summary of key observations and vulnerabilities is provided in **Table 1**. Public land within the harbor consists of the Steamboat Landing boat launch, Harbor Park, Town Landing, and the Camden Yacht Club (**Photographs 3, 20 & 29, respectively**).

3.1 Steamboat Landing Reach

The Steamboat Landing reach stretches from the east edge of Lyman Morse's yard to the western edge of their Bean Yard. The reach begins with a granite stack wall in front of a row of town homes (**Photograph 1**). Moving east the seawall continues, with an offshore broken stone seawall approximately 100 feet in front of the granite stack seawall (**Photograph 1**). This offshore broken stone seawall is below the high tide line, but likely helps reduce the wave energy experienced by the stacked granite seawall during storm events. East of the town homes is the publicly owned Steamboat Landing boat launch.

The boat launch consists of interconnected precast concrete planks, severely damaged in some areas, with stone riprap protection extending perpendicular to the shoreline to the approximate low water line for protection (**Photographs 2 & 3**). Part of the stone riprap, especially on the northeast side, consists of broken and discarded boat launch precast planks and concrete mooring blocks. Shoreward of the stone riprap are racks for kayaks and other small boats (**Photograph 3**). The boat launch planks are broken and displaced throughout with exposed rebar and section loss. We were informed by Mr. Martin that the boat launch precast planks were slated to be replaced with assistance from FEMA with larger precast planks that would be more resilient to uplift and damage from wave action. Adjacent to the boat launch is a floating timber dock held in place by timber guide piles and dolphins. We were informed that prior to predicted storm events the floating docks are removed and stored upland to prevent damage.

East of the boat launch is Lyman Morse's Bean yard which consists of high bay warehouses for boat storage and maintenance. The waterfront of the facility includes stone rip rap and vegetation (**Photograph 4**), with apparent erosion of the relatively steep slope below the buildings. Public access to the waterfront is available in front of the facility; however, wooden stairs that formerly provided access were destroyed during the 2023/2024 winter storms. WSP observed loss of asphalt pavement and exposed geotextile fabric beneath the pavement at the end of the access drive, apparently due to storm impact.

3.2 East Harbor

The East Harbor reach begins with the southern limit of Lyman Morse's boatyard at the end of Wayfarer Drive. This area includes a travel lift supported by piles and winter boat storage area (**Photographs 5 &7**). To the south if the lift, the yard waterfront consists of a stacked granite wall with a concrete cap; an abandoned marine railway extends roughly perpendicular from shore (**Photograph 6**). Speaking with Josh Moore of Lyman Morse, during the winter of 2023/2024 this area was flooded up to the foundation of Building 1 and the attached marina facilities. During these flooding events the travel lift was not able to operate, restricting their ability to perform emergency haul outs. Due to the risk of flooding, Mr. Moore reported that the area adjacent to the travel lift can no longer be used for winter boat storage. Aside from winter storm events, no nuisance flooding was noted at this location. Mr. Moore also described the Harbor Improvements Plan presented to the Camden Select Board on March 9, 2024, outlining their plan to construct a new town-owned pier and wave attenuating dock system off its property adjacent to Steamboat Landing. Currently on hold, this project was intended to be partially funded as part of a Boating Infrastructure Grant from the U.S. Fish and Wildlife Service/ Maine Department of Transportation.

West of the travel lift are the marina's fuel dock, dinghy dock, launch, and dock house, where an above ground diesel and gasoline fuel tank supplies the fuel dock below (**Photograph 8 & 9**). The fuel tank is located on an elevated concrete pad where it may be subject to lateral wind and wave loading and uplift forces from flooding during storm events. The newly renovated Lyman Morse facility extends to the north

with floating docks, and a timber wharf occupied by other businesses in addition to Lyman Morse (**Photograph 10**). The Lyman Morse waterfront facilities were largely renovated in 2022 and reportedly constructed one foot above the base flood elevation at that time. Below the timber wharf, which is publicly accessible, is a mix of steel sheet piling and stacked granite quay walls. The timber floating docks, accessible to boating patrons of Lyman Morse, are accessible through numerous gangways from the timber wharf.

North of the main marina facility the waterfront changes from stacked granite to rip rap with the timber wharf continuing above. From the north end of the timber wharf, a gangway extends down to more of the marina's floating docks and slips. At this area the stacked granite is displaced and irregular with an abandoned timber structure below the waterline (**Photograph 11**). The Parking lot at the north end of the Marina is bound by a stone riprap embankment with vegetation at the waterfront (**Photograph 12**). North of the marina are private residences with stone rip rap along the waterfront. A timber pier extends from one of the private properties, with a single timber floating dock (**Photograph 13**).

At the Northern end of the East Harbor reach is Lyman Morse's outboard service center housed in a historic red boathouse extending towards the waterfront and over the water (**Photograph 14 & 15**). Additionally, there is a path leading from the red boat house south along the waterfront with a gangway extending down to an additional set of floating docks and slips. The waterfront from the east edge of the creek at the Northernmost extent of the harbor to the private properties further south consists of stone rip rap and vegetation (**Photograph 15**).

3.3 North Harbor

The North Harbor reach begins at the stacked granite seawall where a culvert passes underneath Atlantic Avenue (**Photograph 16**). Moving west is the privately owned historic American Boathouse with marine railway extending out into the harbor. The waterfront east of the boathouse is protected by a newly constructed stacked granite seawall (**Photograph 17 & 18**). West of the boat house, a stacked granite seawall abuts Harbor Park (**Photograph 19**). Extending from the west edge of Harbor Park is a pair of timber piers where schooners that offer day sails to the public are docked.

To the east is Harbor Park, which extends from Atlantic Avene down to the waterfront. The waterfront is protected by a granite stacked seawall and public walkway (**Photograph 20**). At the time of WSP's observations, the high tide line had reached the top of the seawall and inundated the public pathway near the granite ramp on the west edge of the park (**Photograph 21**). Some of the granite stones on the top course of the seawall had been slightly displaced outwards, and there was evidence of recent gravel fill being placed behind the seawall suggesting recent loss of fill (**Photograph 20**). The western limit of the North Harbor reach is the north shore of the Megunticook Falls. The stacked granite seawall of the park transitions to ledge near the falls (**Photograph 22**).

3.4 West Harbor

Beginning at the Megunticook Falls, a concrete dam above exposed ledge is bound to the north by a concrete/stone spillway wall (**Photograph 22 & 23**). Above the falls are several businesses supported by wooden piles along Main Street, above the water held back by the dam. Below the falls is a small island where a bridge was being constructed at the time of the reconnaissance to facilitate vegetation management on the island.

South of the falls is the Town Landing Wharf and parking area (**Photograph 23**). This area includes public parking spaces, the Harbor Master's office, public restrooms, and a sewage lift station. Above the parking area are several businesses, and to the south is a hotel and restaurant. The waterfront at the town landing is protected by granite stack seawalls with a timber wharf above. Along the timber wharfs are a mix of decayed old timber piles and replacement fender piles. Three floating docks extend out from the landing, with a floating dock running along the eastern edge. There was evidence of a recently placed concrete slab and new timber decking along the waterfront suggesting recent damage. Mr. Martin noted that the lift station located behind the public restrooms was a critical infrastructure component and is at risk from inundation in storm/high-water events.

South of the Town Landing Wharf, restaurants, residences, and other businesses extend along the waterfront up to the Camden Yacht Club a property owned by the town (**Photograph 24, 25 & 26**). WSP observed private property from the town landing, Bay View Road, the Camden Yacht club, and from across the harbor. The waterfront of these private properties consists primarily of granite stack quay walls with timber decking above and timber piles. In front of the timber wharf are a patchwork of privately owned floating docks. Observations from Bay View Street indicated seawater upwelling through the abandoned locks of the former marina and the adjacent parking garage at 52 Bay View Street. At the intersection of Bay View and Frye Street, upwelling of seawater through a storm manhole was also observed. Topographical maps and photographs from previous winter storms indicate that this area of Bay View Street near the end of Frye Street is a natural low point and is subject to inundation during storm and high water events.

At the southern end of the West Harbor reach is the Camden Yacht Club (**Photograph 27 & 29**). The Camden Yacht Club property is one of the most exposed properties of the inner harbor and has received severe damage in recent winter storms. The club's offices, covered porch, and patio were severely damaged during winter 2023/2024 by high water and waves; the patio was repaired with a new concrete slab and field stones (**Photograph 28**). The concrete slab that supports the main building of the yacht club has extensive cracking and apparent settlement, potentially due to loss of fines through the granite stack seawall. There was evidence of recent damage and repairs to the southeastern side of the club building from winter storm events.

The yacht club property waterfront is protected by a granite stack seawall with a concrete cap. Mr. Martin reported that the field stone walkway behind the northern seawall face are regularly displaced during winter storms, and the field stone walkway on the southeastern face was damaged during winter 2023/2024 and was not replaced. WSP observed recent fill, evidence of loss of fill, and recent repair behind the seawall (**Photograph 30 & 31**). The seawall on the southeastern face is similar to the northern face construction, with a partial-height concrete seawall in front. The concrete cap has sporadic cracking and is displaced outward as it approaches the shore. The partial height seawall starts at the shoreline and extends approximately three quarters of the way along the southeast face (**Photograph 32**). This concrete seawall has failed and is separated into four distinct sections.

4.0 IMPACTS FROM SEA LEVEL RISE AND STORM SURGE

WSP reviewed publicly available Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for Camden Harbor. The Steamboat Landing reach and Camden Yacht Club property are mapped within the FEMA VE Zone with a current Base Flood Elevation (BFE) of 16 ft. The VE Zone is defined as

a Special Flood Hazard Area (SFHA), Coastal High Risk, which are high risk areas that will be inundated by the BFE. The BFE is defined as the elevation, with respect to the North American Vertical Datum of 1988 (NAVD88), of the surface water resulting from a flood that has a 1-percent chance of equaling or exceeded that level in any given year. The remainder of the harbor waterfront falls within flood zone AE (high risk of flooding) with a BFE ranging from 10 to 12 feet.

The current BFEs were last updated in 2016 and do not include projected sea level rise (SLR). WSP prepared a composite map (**Figure 2**) of water level elevations during the 1 percent annual storm event ("100-year flood") for three SLR scenarios below. The resulting flood elevations were modelled by adding the rrepsective SLR value to the current FEMA flood map, and extending the elevation inland based on LiDAR data published in 2021 by the US Geological Survey.

- Near term (year 2030): 0.8 feet of SLR
- Mid-term (year 2050): 1.5 feet of SLR
- Long term (year 2100): 3.9 feet of SLR

The three SLR scenarios are based on planning recommendations provided by the Maine Geological Survey in February 2024. As shown on Figure 2, a substantially greater area of coastal inundation would result from a base flood event combined with future projections of SLR. For example, inundation is projected to extend across Bay View Street on the west side of the harbor, and well above the Steamboat Landing access drive on the east side of the harbor.

Figures 3A and 3B provide water levels at each of four public properties along the inner harbor: Camden Yacht Club, Town Landing Wharf (Public Landing), Harbor Park, and Steamboat landing. The graphs provide projected water level elevations (NAVD88 datum) for the 1 percent storm event for each SLR scenario, and the elevation of Mean High High Water (MHHW) and the Highest Annual Tide (HAT). The MHHW level is based on tidal data for the nearby tide monitoring station at Rockland, ME, and the HAT is based on data published by the Maine Geological Survey updated through 2023.

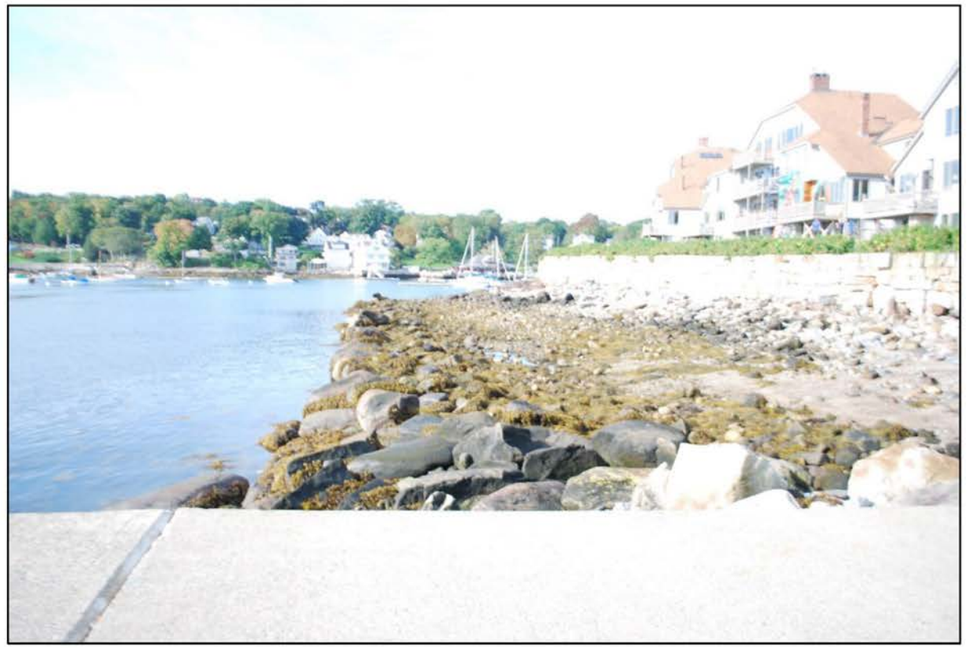
5.0 RESILIENCY PLANNING

Based on observations during WSP's site visit and subsequent data analysis, development of a proactive resiliency plan can help protect the study area from the combined impacts of storm events, storm surge and projected sea level rise. A resiliency plan should consider both short term and long term strategies, such as:

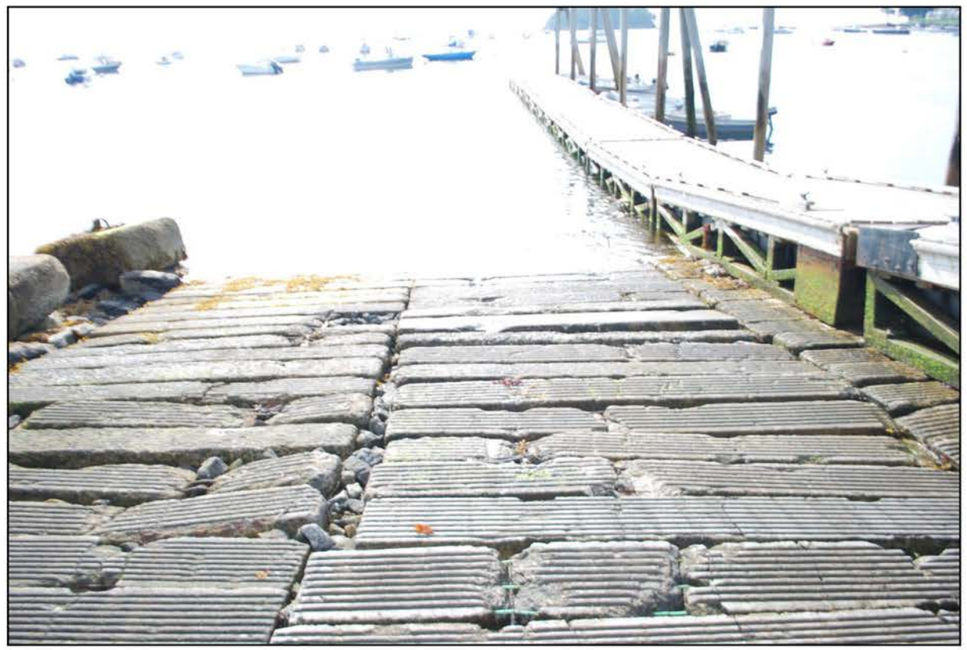
- Strengthening existing waterfront structures to the impacts of storm events;
- Raising structures and/or the existing waterfront elevation to mitigate impacts of projected rising sea levels;
- Mitigating storm induced wave action through means such as breakwaters or floating wave attenuation structures or a combination of the two;
- Requirements for new (or replacement) construction to be elevated above future BFEs with hardened designed to limit damage from storm events; and
- Further analysis and inspection of private properties within the study area to identify vulnerabilities and inform resilience planning.

Table 1 - Shore Conditions Overview
Camden Harbor Resilience Planning
Camden, Maine

Location	Land Use	Shoreline Type	Vulnerability/Observations
Public Land			
Camden Yacht Club	Yacht club docking and operations	Granite block wall	• Seawall damage • Erosion/washout • Building flooding, damage
Public Landing	Harbor Master's office, dock operations		• Flooding/damage during December 2022 storm • New concrete decking, asphalt and other repair • Harbormaster's office close to landing edge
Harbor Park	Recreational space		• Frequent flooding along seawall at high tide • Seawall blocks displaced, evidence of shore repair
Steamboat Landing	Boat launch, kayak racks, dock	Concrete ramp/stone riprap	• Concrete planks on boat ramp displaced, cracked • Erosion noted along shore and asphalt drive
Private Property			
Lyman Morse	Marina, boatyard, restaurant/shops	Built edge (wharf, seawall)	• Major reconstruction reported in 2021/2022 • Buildings elevated to 1-foot above base flood • Improved resilience, boatyard storage limited



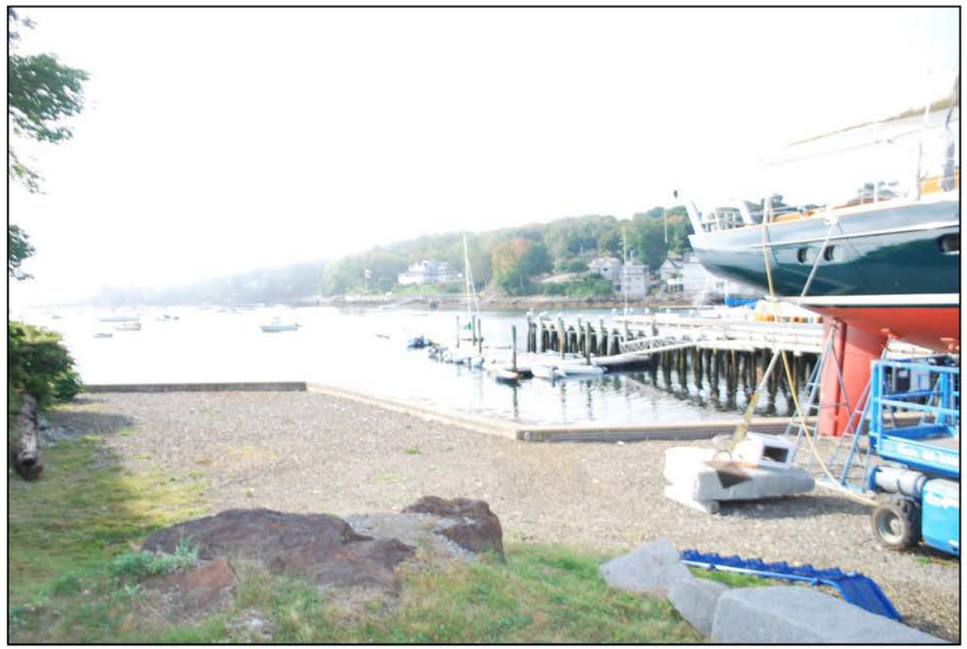
Photograph 1: Offshore seawall in front of townhomes stacked granite seawall.



Photograph 2: Steamboat Landing boat launch.

Photograph 3: Steamboat Landing boat launch and small boat storage.

Photograph 4: Lyman Morse Bean Yard waterfront and beach.



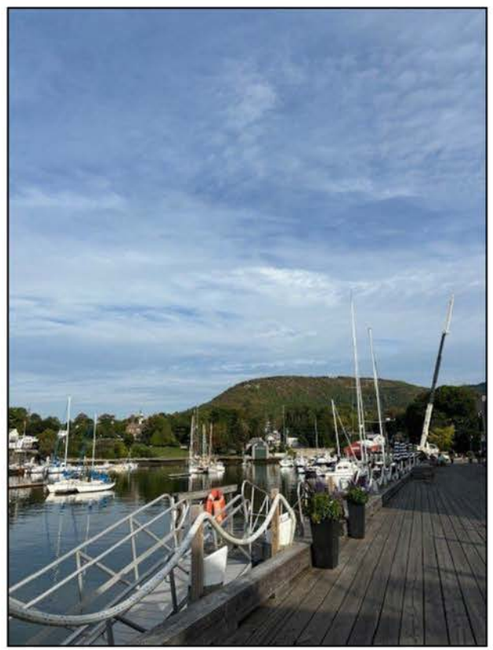
Photograph 5: Lyman Morse boat storage with dinghy dock and travel lift in background.

Photograph 6: Seawall at Lyman Morse boat storage area and abandoned marine railway.

Photograph 7: Lyman Morse travel lift and dock house.

Photograph 8: Lyman Morse fuel storage tank.

Photograph 9: Lyman Morse Fuel Dock.



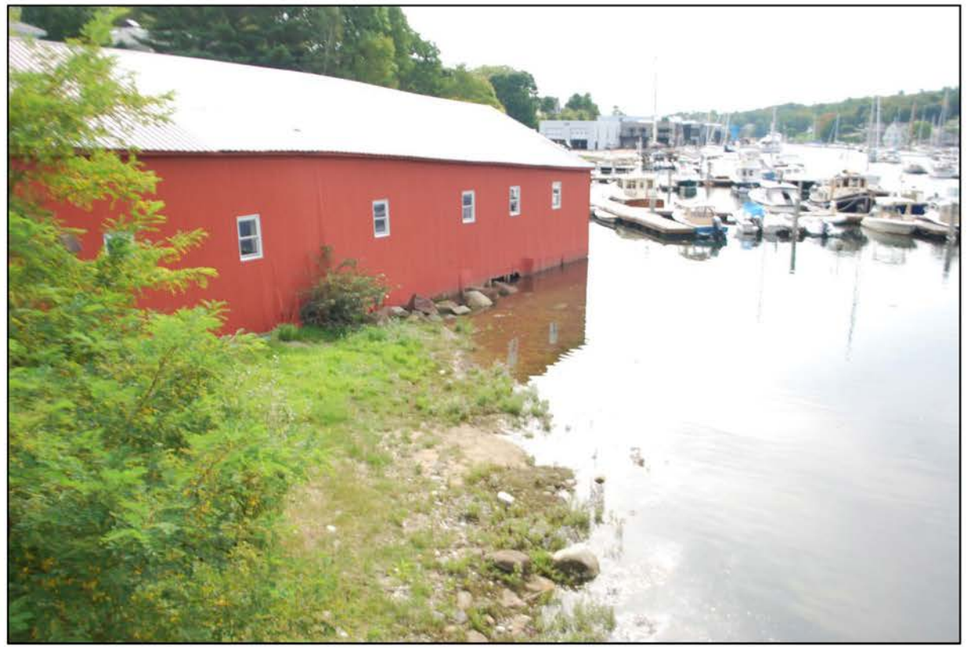
Photograph 10: Lyman Morse timber wharf with gangways to floating docks.

Photograph 11: Displaced stacked granite at north end of Lyman Morse Wharf.

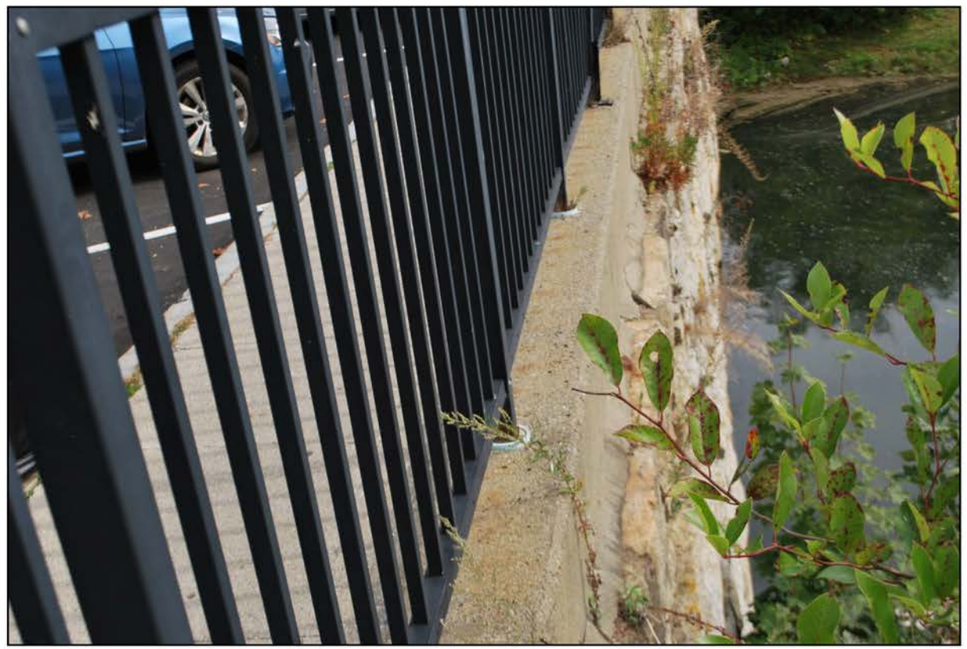
Photograph 12: Stone riprap and vegetation at Lyman Morse parking lot and private property to North.

Photograph 13: Timber pier with gangway and float extending from private property.

Photograph 14: Path to docks behind red boathouse housing Lyman Morse outboard service center.



Photograph 15: Lyman Morse Outboard Service Center in historic red boathouse.



Photograph 16: Stone seawall at North end of harbor.

Photograph 17: New stacked granite seawall at American Boathouse.

Photograph 18: New stacked granite seawall with American Boathouse in background.

Photograph 19: American boathouse with schooner pier and Harbor Park in foreground.

Photograph 20: Harbor Park seawall.

Photograph 21: Inundation at East edge of Harbor Park.

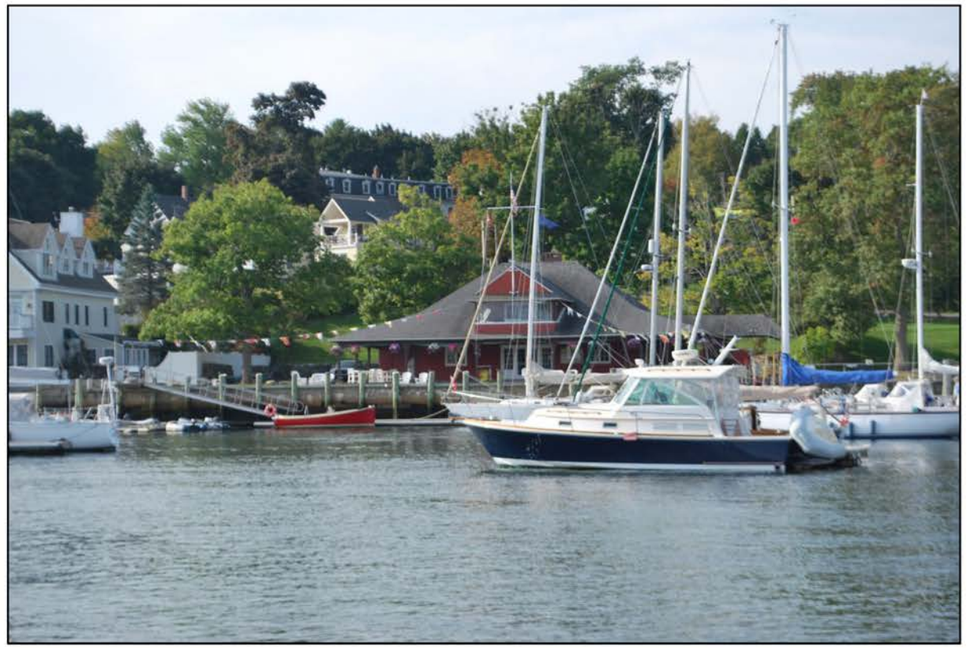
Photograph 22: Harbor Park seawall with Megunticook Falls in the background.

Photograph 23: Megunticook Falls with Town Landing in the Background.

Photograph 24: View of private properties on East reach of harbor from Town Landing.

Photograph 25: View of private properties on East reach of harbor from Lyman Morse Marina.

Photograph 26: View of private properties on East reach of harbor from Lyman Morse Marina.



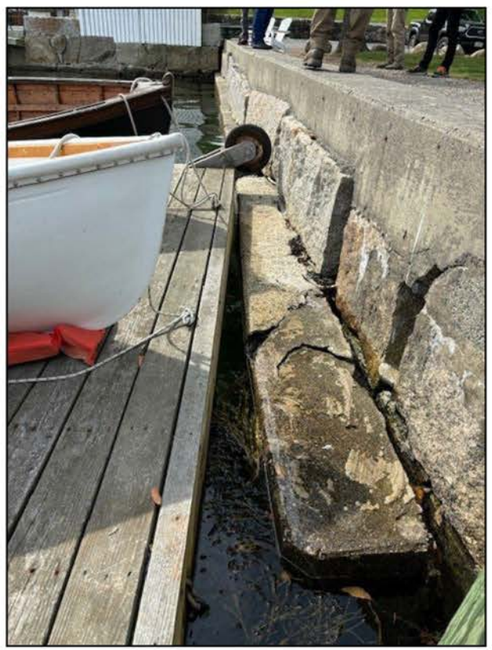
Photograph 27: View of Camden Yacht Club on East reach of harbor from Lyman Morse Marina.

Photograph 28: Camden Yacht Club offices and seawall.

Photograph 29: Camden Yacht Club floating docks.

Photograph 30: Camden Yacht Club stacked granite seawall and concrete cap with fresh fill behind.

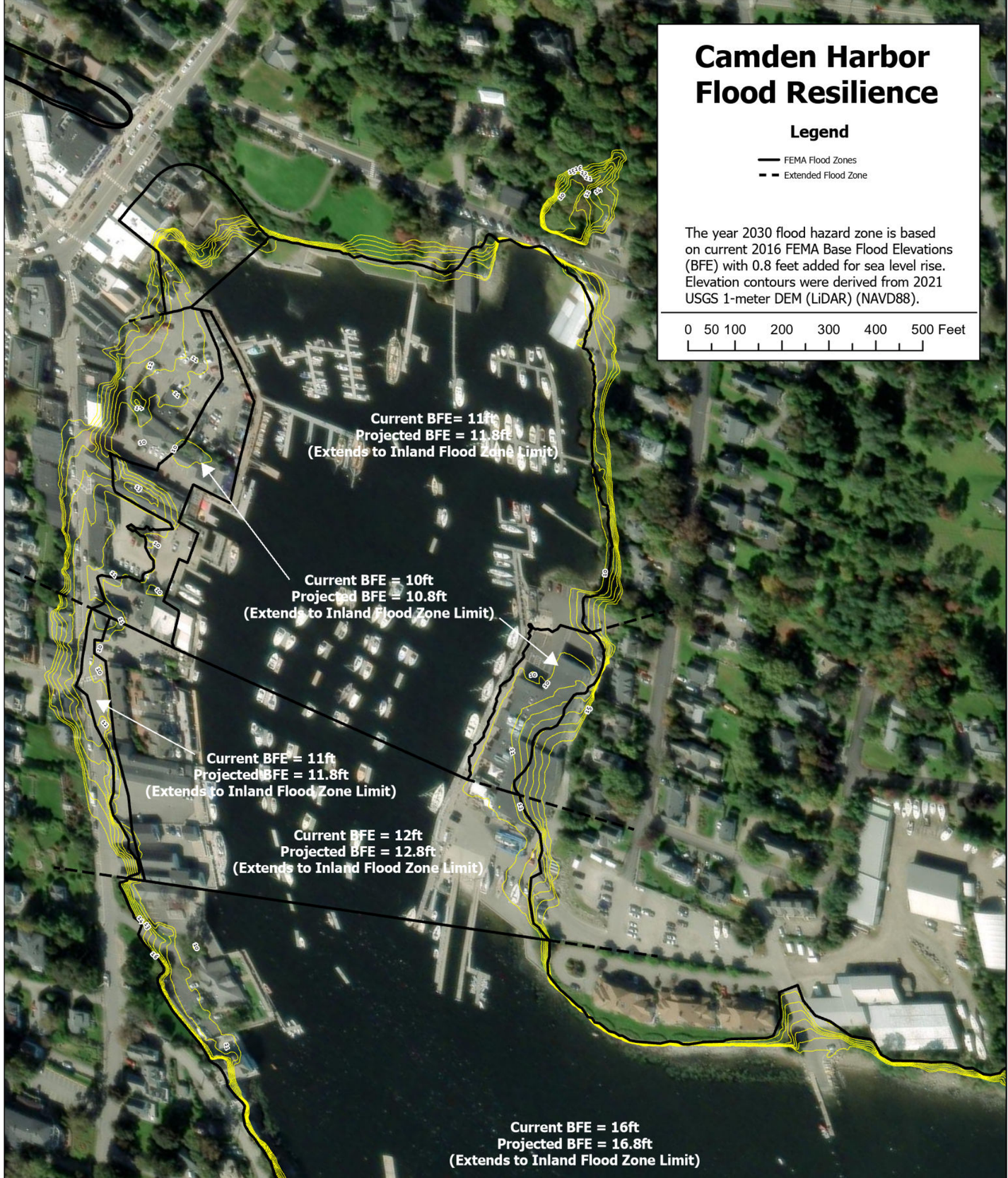
Photograph 31: Camden Yacht Club South seawall showing displacement and fresh fill.



Photograph 32: Failed Southern concrete seawall in front of stacked granite seawall with concrete cap.

FLOOD MAPPING

FLOOD MAPPING



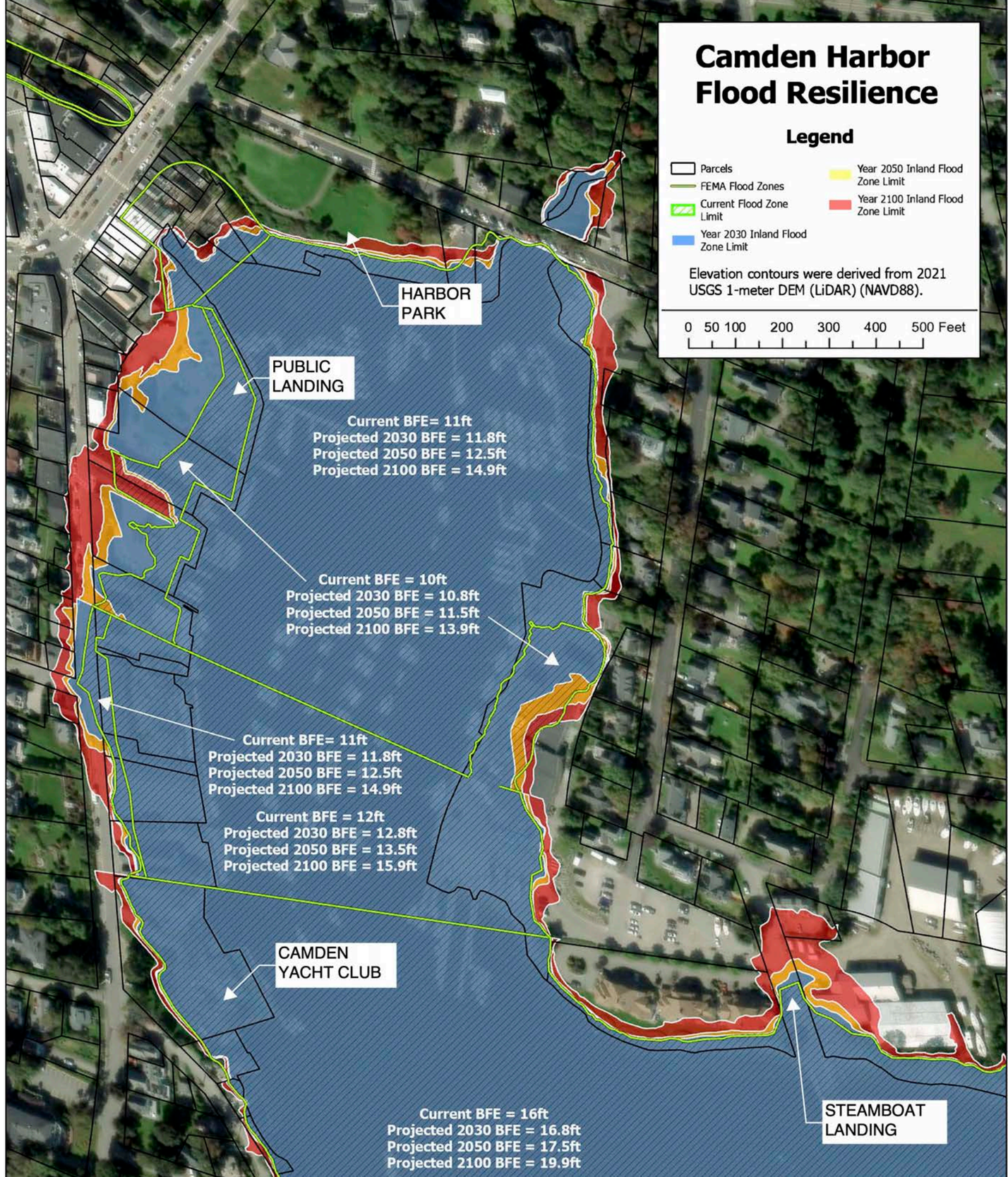
FLOOD MAPPING COMBINED

Flood/SLR Mapping

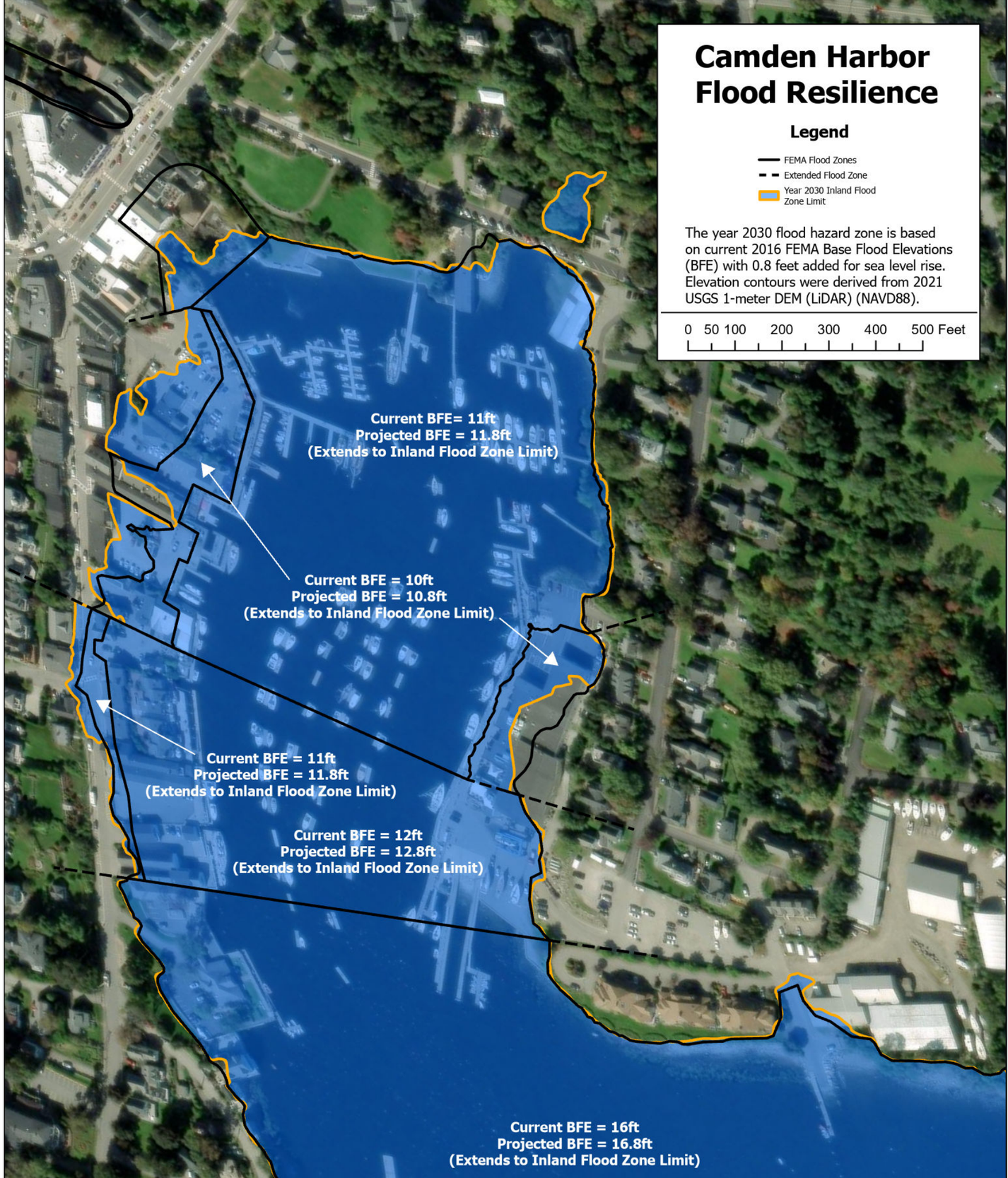
To support thoughtful planning for flood resilience within Camden's inner harbor, Richardson & Associates/WSP developed a series of flood maps based on the Federal Emergency Management Agency (FEMA) Base Flood Elevation (BFE). The FEMA BFE map shows the predicted sea level elevations for the 1 percent annual chance flood event, typically referred to as the "100-year flood." The BFE includes flood levels from storm surge, tide, and waves, and is often used in determining the appropriate Design Flood Elevation for new construction. One limitation is that the BFE does not account for sea level rise (SLR). As a result, Richardson & Associates/WSP developed flood maps showing an estimated increase in the BFE for three SLR scenarios:

Near term (year 2030): 0.8 feet of SLR
Mid-term (year 2050): 1.5 feet of SLR
Long term (year 2100): 3.9 feet of SLR

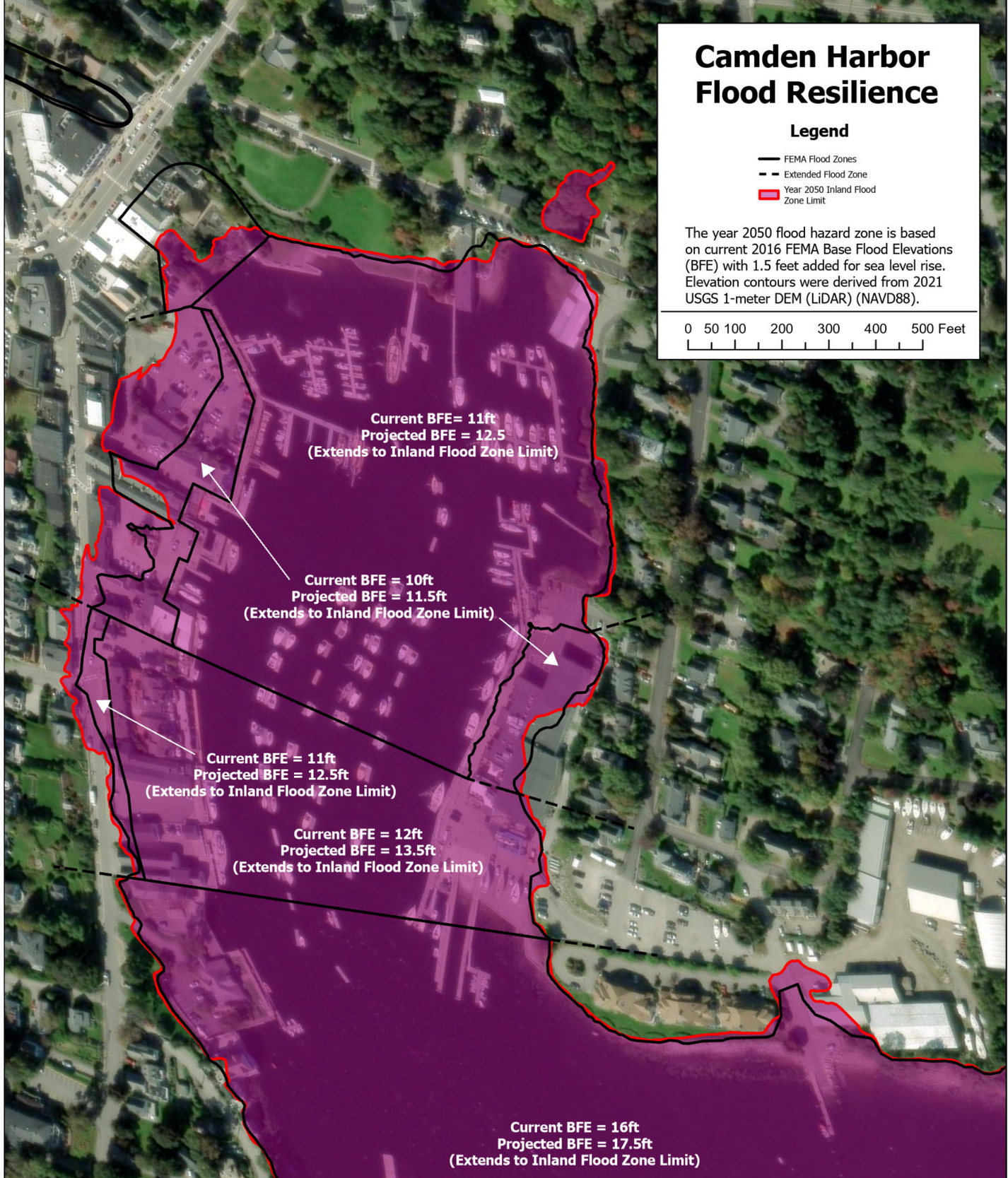
The SLR scenarios were selected based on information provided by the Maine Geological Survey (Sea Level Rise and Coastal Resiliency, February 15, 2024) and are consistent with guidance provide by the Maine Climate Council (Maine Won't Wait, November 2024). The combined BFE and SLR scenario maps rely on LiDAR topographic data published by the United States Geological Survey in 2021 (NAVD 88 datum). The composite SLR flood map used for conceptual planning by Richardson & Associates/WSP and shared with the Camden community is shown here (i.e., the map depicts the FEMA BFE and the three SLR scenarios on one map).



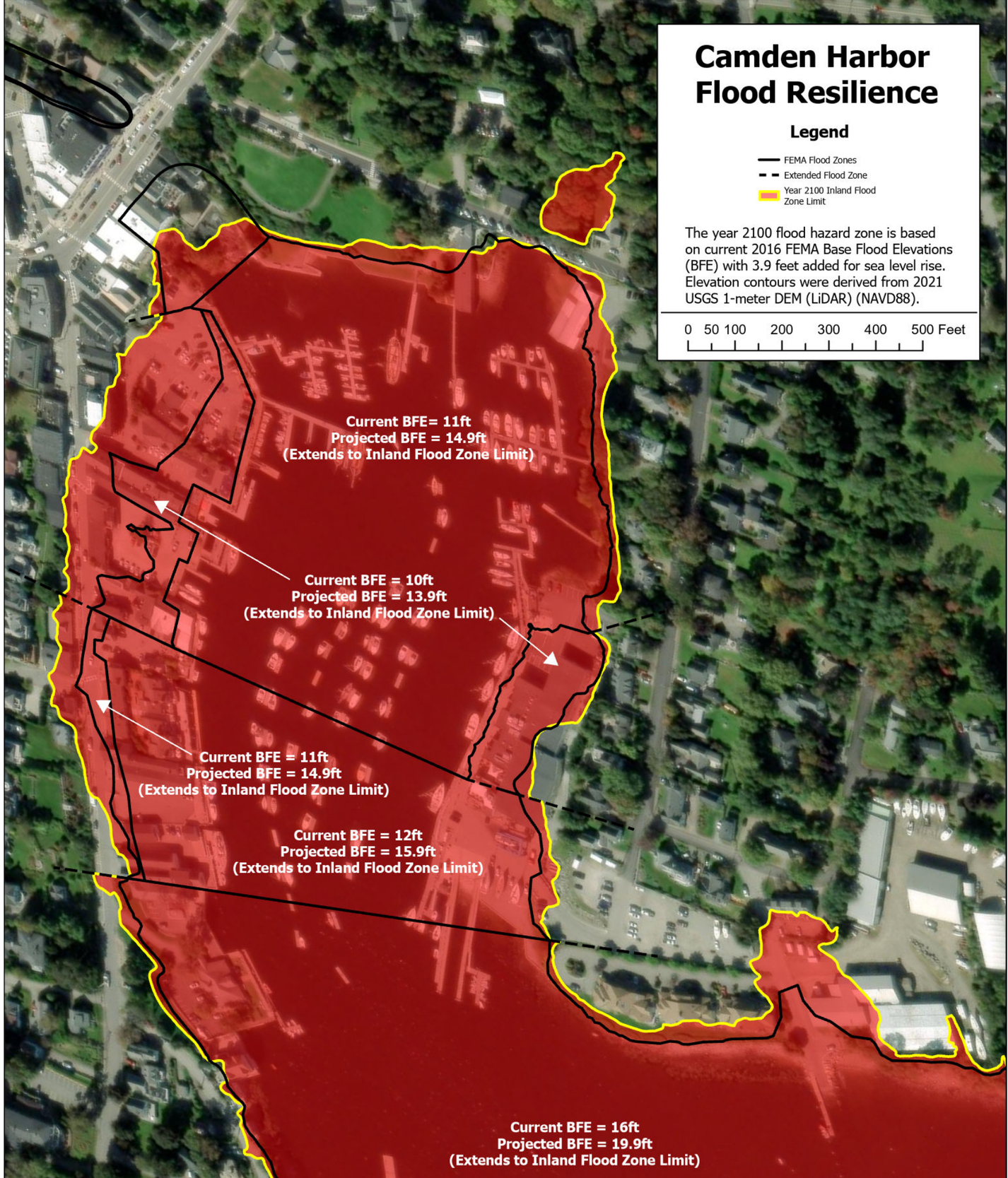
FLOOD MAPPING 2030



FLOOD MAPPING 2050



FLOOD MAPPING 2100



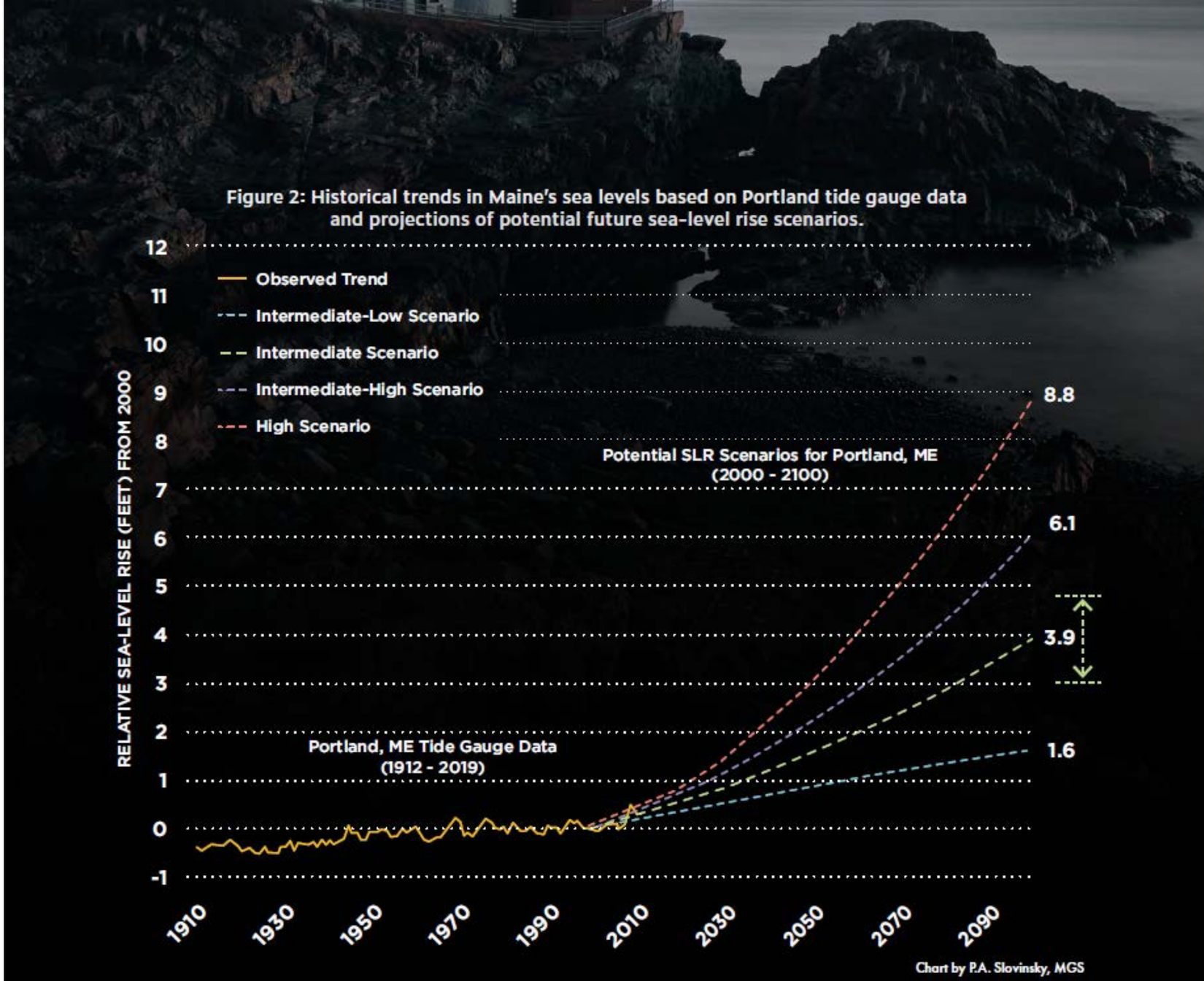
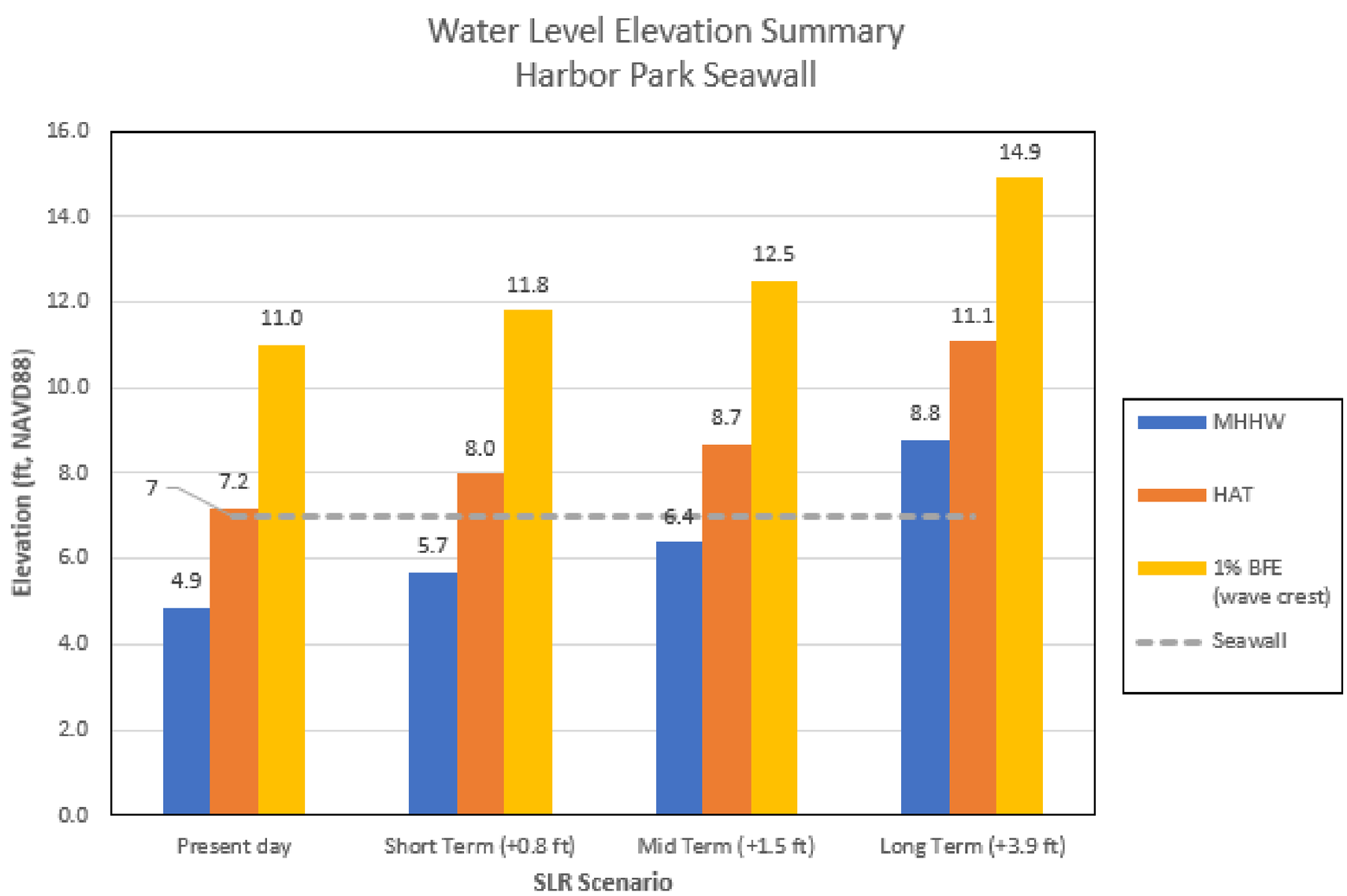


Figure 2: Historical trends in Maine's sea levels based on Portland tide gauge data and projections of potential future sea-level rise scenarios.

Sea level has risen in Maine over the last century and is expected to continue rising along Maine's coastline well beyond 2100. The Scientific and Technical Subcommittee recommends the State commit to manage for 1.5 feet of relative sea-level rise by 2050 and 3.9 feet of relative sea-level rise by 2100 (green arrows in the figure), and consider preparing to manage for 8.8 feet of sea-level rise by 2100, especially for low-risk-tolerant infrastructure. (See the Scientific Assessment of Climate Change and its Effects in Maine, Sea Level Rise and Storm Surge chapter for more details.)

HARBOR PARK SEAWALL

WSP developed water level profiles to support planning and risk evaluation for four inner harbor properties owned by the town. At Harbor Park, the present day base flood elevation (BFE), Mean Higher High Water (MHHW), and Highest Astronomical Tide (HAT), are shown for the present day and the three SLR scenarios. These key potential flood levels are compared to a reference elevation of the existing Harbor Park seawall (shown as the grey dashed line) for evaluation of potential inundation of the park. The water levels for MHHW and HAT are shown to support planning for non-storm related high water events that may also create property access or operational challenges, especially for future SLR scenarios. MHHW is an average of the highest daily high tide, while the HAT occurs typically once per year.

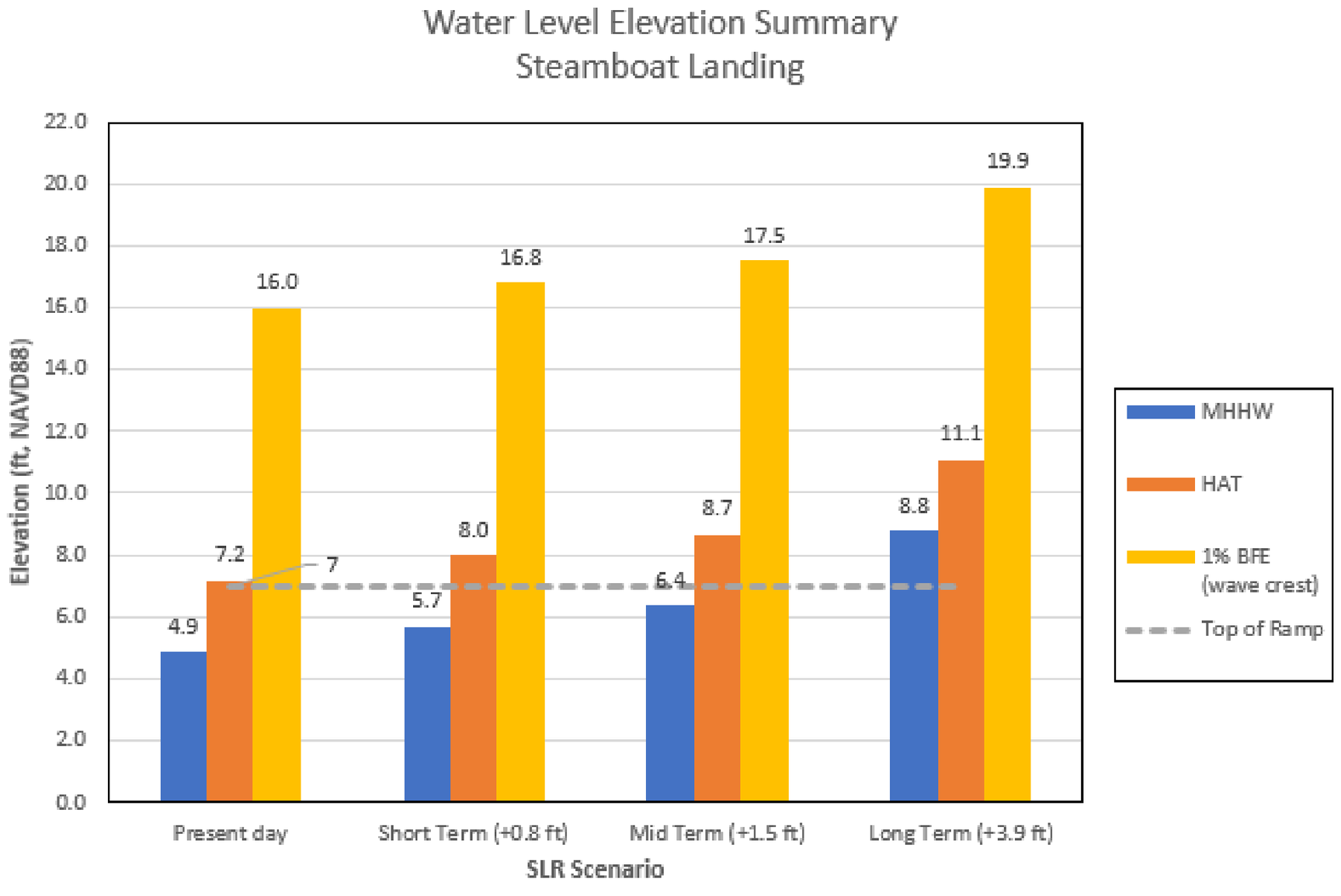


NOTES:

SHORT TERM = 2030
MID TERM = 2050
LONG TERM = 2100

STEAMBOAT LANDING

WSP developed water level profiles to support planning and risk evaluation for four inner harbor properties owned by the town. At Steamboat Landing, the present day base flood elevation (BFE), Mean Higher High Water (MHHW), and Highest Astronomical Tide (HAT), are shown for the present day and the three SLR scenarios. These key potential flood levels are compared to a reference elevation of the existing site (shown as the grey dashed line) for evaluation of potential inundation of the park. The water levels for MHHW and HAT are shown to support planning for non-storm related high water events that may also create property access or operational challenges, especially for future SLR scenarios. MHHW is an average of the highest daily high tide, while the HAT occurs typically once per year.

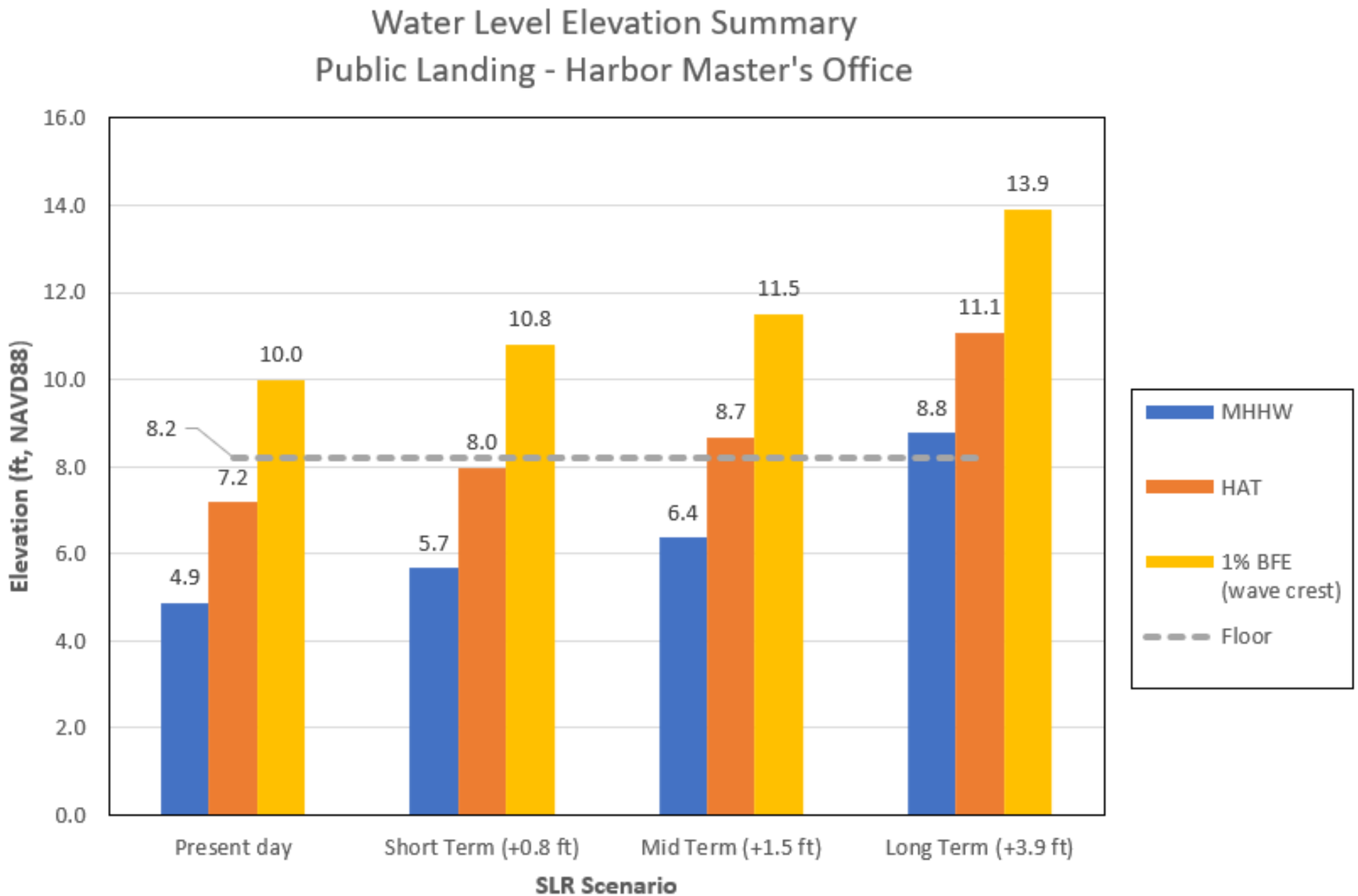


NOTES:

SHORT TERM = 2030
MID TERM = 2050
LONG TERM = 2100

TOWN LANDING

WSP developed water level profiles to support planning and risk evaluation for four inner harbor properties owned by the town. At the Town Landing, the present day base flood elevation (BFE), Mean Higher High Water (MHHW), and Highest Astronomical Tide (HAT), are shown for the present day and the three SLR scenarios. These key potential flood levels are compared to a reference elevation of the existing Harbor Master's Office (shown as the grey dashed line) for evaluation of potential inundation of the park. The water levels for MHHW and HAT are shown to support planning for non-storm related high water events that may also create property access or operational challenges, especially for future SLR scenarios. MHHW is an average of the highest daily high tide, while the HAT occurs typically once per year.

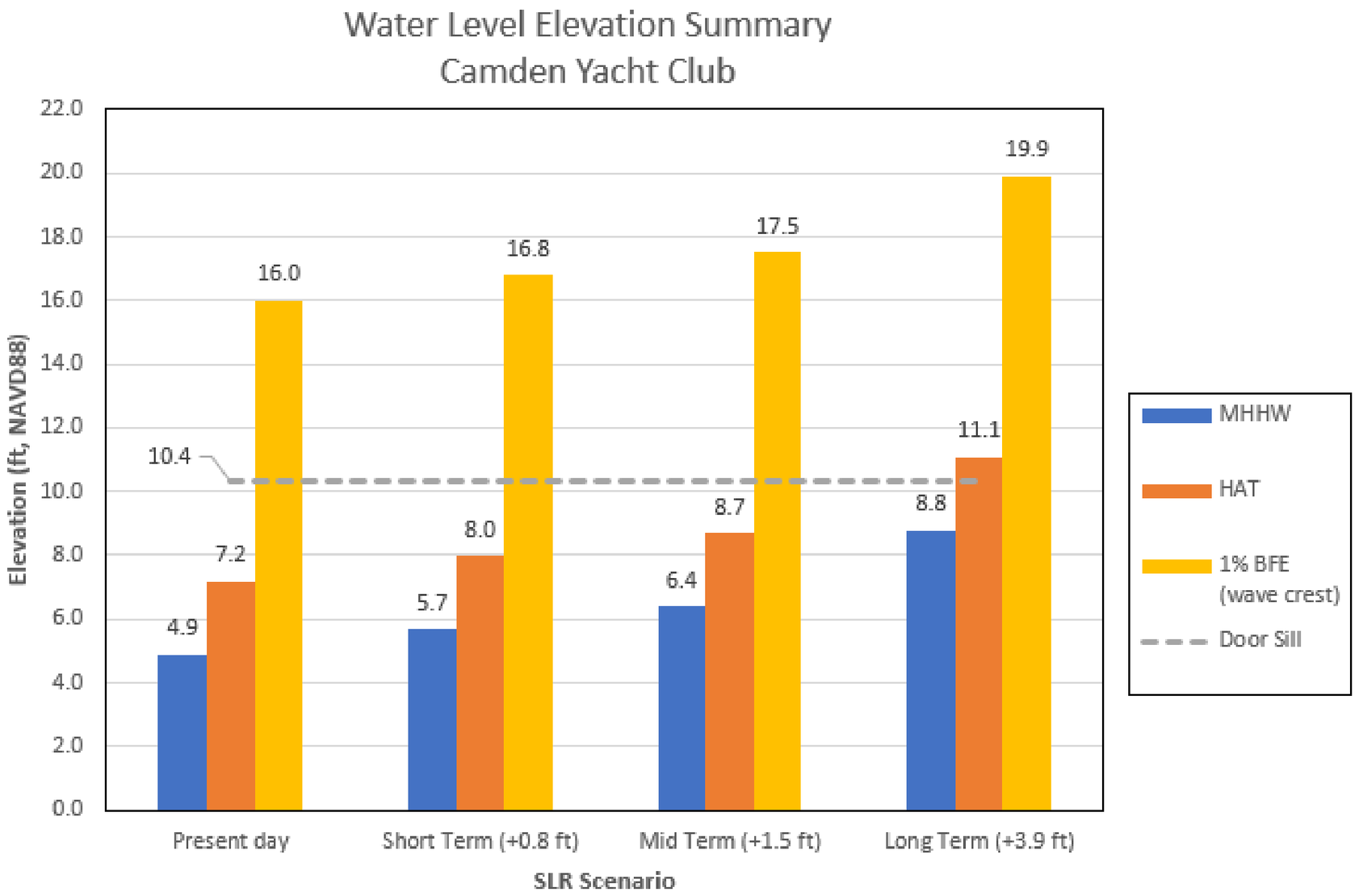


NOTES:

SHORT TERM = 2030
MID TERM = 2050
LONG TERM = 2100

YACHT CLUB

WSP developed water level profiles to support planning and risk evaluation for four inner harbor properties owned by the town. At the Yacht Club, the present day base flood elevation (BFE), Mean Higher High Water (MHHW), and Highest Astronomical Tide (HAT), are shown for the present day and the three SLR scenarios. These key potential flood levels are compared to a reference existing floor elevation Yacht Club (shown as the grey dashed line) for evaluation of potential inundation of the park. The water levels for MHHW and HAT are shown to support planning for non-storm related high water events that may also create property access or operational challenges, especially for future SLR scenarios. MHHW is an average of the highest daily high tide, while the HAT occurs typically once per year.



NOTES:

SHORT TERM = 2030
MID TERM = 2050
LONG TERM = 2100

Design
for a better
future

Town of Camden Flood Zone Study
Contour and Polygon Data Creation Methodology

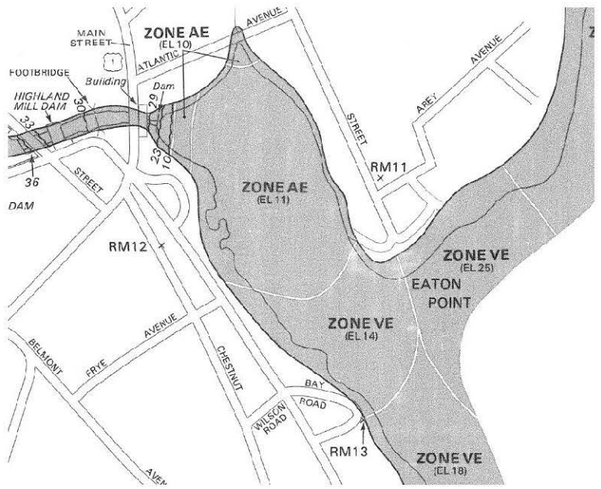
Prepared by: Jason Frazier, Senior Data Scientist
September 2024

Town of Camden Future Flood Zones Methodology

Background

The current predictions for mean sea level rise are an 0.8-foot increase by 2030, 1.5 feet by 2050, and 3.9 feet by 2100. The current FEMA map and hazard zones for the Town and Camden, Maine was made effective July 6, 2016, and has a map number of 23013C0179D and 23013C0183D. The previously published Flood Insurance Rate Map (FIRM) was made effective May 4, 1988, and can be found here: FIRMette Web [2300740014B] (fema.gov)

Current FEMA Flood Map (screenshot), Effective 7/6/2016



Previous FEMA Flood Map (screenshot), Effective 5/4/1988

Contour Creation for Analysis

The current FEMA outer flood hazard zones for the Town of Camden are at elevations 10 feet, 11 feet, 12 feet, and 16 feet above sea level and sub-foot intervals are required to show future flood hazard zones. The State of Maine has publicly available 2-foot contours that were created from LiDAR point cloud data in 2019 and are too outdated for this work. The United States Geological Survey (USGS) has publicly available LiDAR and 1-meter Data Elevation Model (DEM) data created in 2021 and available to download. Using ESRI's ArcGIS Pro 3.2.0 and the 3D Analyst Contour tool, multiple 1-foot contours were created using a base of 0, 0.5, 0.8, and 0.9 to create the necessary contour lines for this work. During this contour creation process, the elevations were converted from meters to feet with a conversion factor of 3.208. Contours were created from the LiDAR point cloud and DEM datasets for comparison. The DEM derived contours had less noise and improved smoothness compared to the LiDAR point cloud derived contours, resulting in the DEM derived contours being chosen for this study.

Flood Hazard Polygon Creation

For the 2030 sea level rise scenario, 0.8-foot elevation was added to the existing FEMA flood hazard zones. This entailed creating new polygons using the ArcGIS tracing option to trace the appropriate contours of 10.8 feet, 11.8 feet, 12.8 feet, and 16.8 feet within the appropriate flood hazard zones as specified on the FEMA flood map. For the 2050 sea level rise scenario, 1.5 feet were added to the existing FEMA flood hazard zones, which used the 11.5 feet, 12.5 feet, 13.5 feet, and 17.5 feet contour lines. The 2100 scenario, with an increase of 3.9 feet, used the 13.9 feet, 14.9 feet, 15.9 feet, and 19.9 feet contour lines.

The 2030 (purple), 2050 (yellow), and 2100 (red) Flood Hazard Polygons (screenshot)

FEMA Flood Map Changes

FEMA has preliminary changes since the last published FIRM available for public view. The preliminary map shows an increase in Coastal High Hazard Area similar to the year 2100 scenario. The Flood Map Changes Viewer can be found here: [Flood Map Changes Viewer (arcgis.com)]

FEMA Preliminary Coastal High Hazard Area (screenshot)

Coordinate Systems Used in Study

NAD 1983

- All FEMA Sourced data
- Flood_Polygon_2030
- Flood_Polygon_2050
- Flood_Polygon_2100

NAD 1983 UTM Zone 19N

- All DEM derived contours (0.5ft, 0.8ft, 0.9ft, 1ft)

NAD 1983 (2011) UTM Zone 19N

- USGS DEM (2021)
- USGS LiDAR point cloud (2021)
- State of Maine 2-foot contours (2019)

Data Sources

USGS LiDAR & DEM: GIS Data Download | U.S. Geological Survey (usgs.gov)

FEMA Current Flood Map: Flood Maps | FEMA.gov

FEMA Historic Flood Maps: FEMA Flood Map Service Center | Search All Products

FEMA Flood Map Changes: FEMA's Flood Map Changes Viewer

FEMA Flood Hazard GIS Shapefile Download:
https://msc.fema.gov/portal/downloadProduct?productTypeID=FLOOD_RISK_PRODUCT&productSubTypeID=FLOOD_RISK_DB&productID=FRD_23013C_ShapeFiles

PUBLIC ENGAGEMENT PROCESS

PUBLIC PROCESS OVERVIEW

Public Engagement Event 1: "Invite and Excite"
The first community engagement event was held at the Camden Library on October 15, 2024. The meeting was advertised on public media channels as well as community news outlets thanks to Town staff and volunteers from CamdenCAN. The Town Planning Director set the scene by giving an overview of the project scope. The project timeline and engagement schedule was shared to ensure the community is aware of opportunities to participate in the co-creation process. Then the consultant team provided an overview of the site analysis data the consultant team had organized to inform the community about SLR projections in Camden Inner Harbor. Then we shared examples of how similar communities are addressing SLR risk through precedent imagery that spans the range of potential technologies and solution sets.

First Public Survey
The first public survey was made available at the first public engagement event on October 15th. The survey was available online and hard copies were also made available. All of the hard copies received were aggregated with the online responses. The survey window ran through October 25 and the results were used to inform the design alternatives.

Focus Groups: "Meet and Greet"
In order to dive more deeply into critical issues, 3 focus group sessions were held the first week of December, 2024 with key stakeholder groups. This included one focused on businesses in and around the Inner Harbor, one focused on the public realm (including the library), and one with members of the grassroots community group CamdenCAN. From these meetings, the consultant team was able to hear firsthand the challenges and goals of different stakeholders and answer their questions in a proactive manner. The session with municipal staff was recorded and made available to the public.

Public Engagement Event 2: "Let's Get Creative"
At this stage of the process, the team reconvened with a public meeting in Camden. The session started with a recap of the process to date and a report out of the public feedback and focus group input. Then, the team shared 2 preliminary alternatives that took different approaches to addressing sea level rise threats. Attendees were asked to share their questions throughout the session and at the completion of the presentation. In this format, we gathered feedback on the pros and cons of each approach.

Second Public Survey
A second public survery was made available at the second public engagement event and it asked participants to rank the draft alternatives or combine their preferred elements from each. In this way, the process is able to identify the strategy the public prefers for further consideration by land owners.

PUBLIC PROCESS TIMELINE

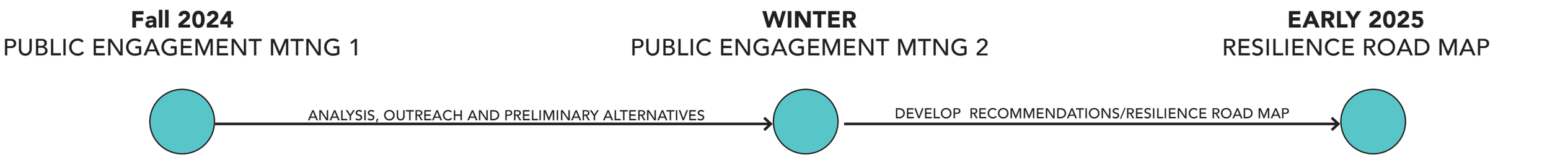
10/15 PUBLIC ENGAGEMENT MTNG 1

10/15-11/01 PUBLIC SURVEY WINDOW

12/2 STAKEHOLDER MTNG 1: CamdenCAN
12/3 STAKEHOLDER MTNG 2: City Representatives
12/4 STAKEHOLDER MTNG 3: Local Business Representatives

12/4-2/5 ALTERNATIVE DEVELOPMENT

ADDITIONAL Touch Points:
Camden Library Trustees
FEMA
DPW



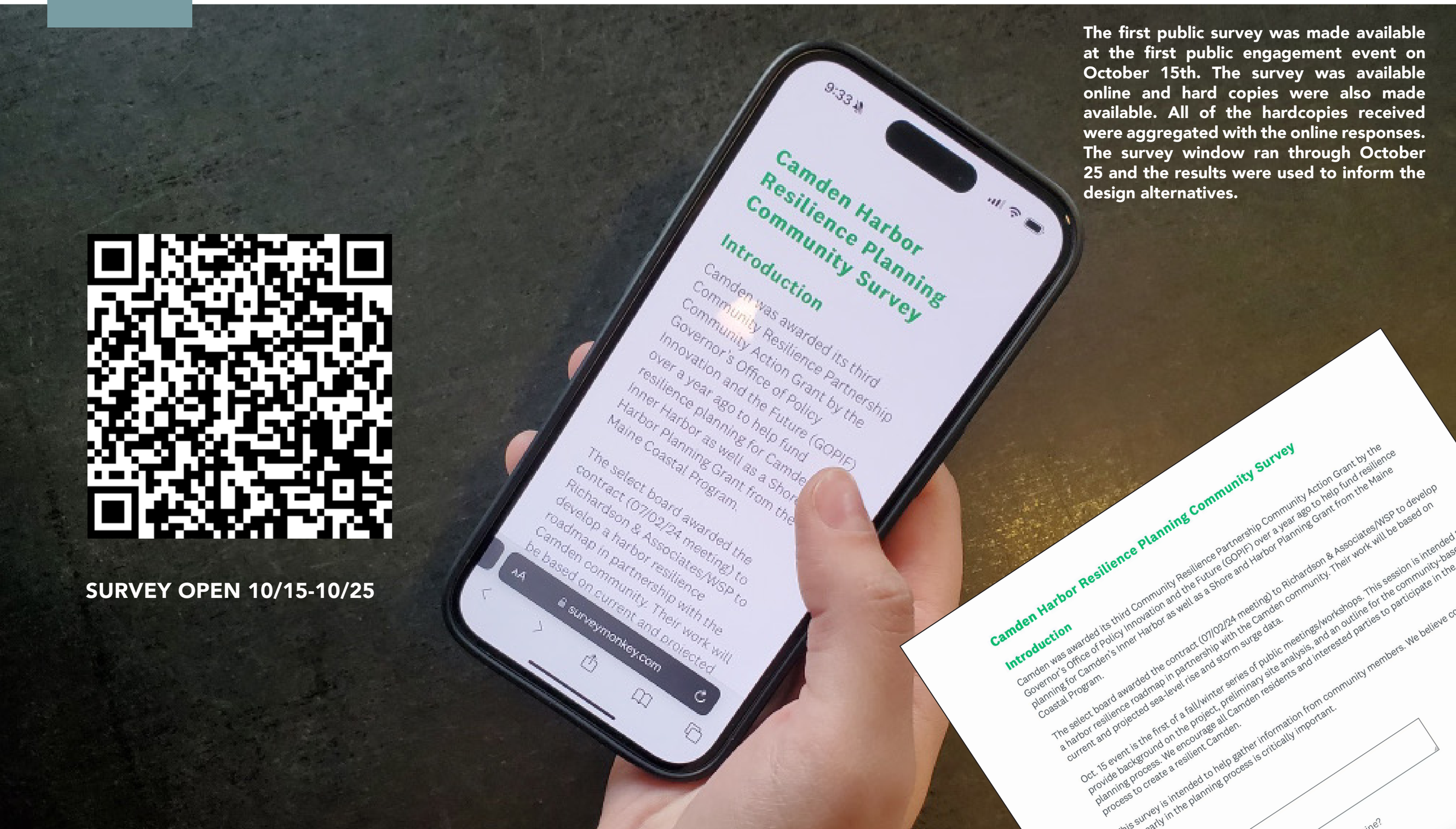
ANTICIPATED PROJECT TIMELINE. PLEASE VISIT THE TOWN'S PROJECT WEBSITE FOR THE LATEST INFORMATION

FIRST PUBLIC SURVEY_RESULTS

PUBLIC SURVEY

The first public survey was made available at the first public engagement event on October 15th. The survey was available online and hard copies were also made available. All of the hardcopies received were aggregated with the online responses. The survey window ran through October 25 and the results were used to inform the design alternatives.

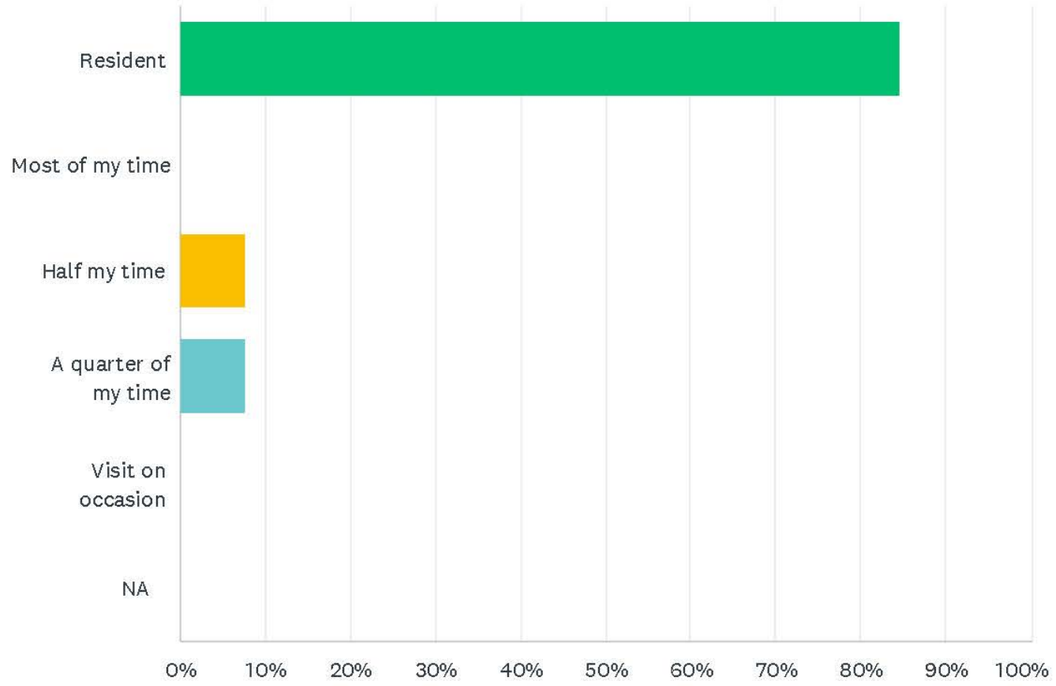
SURVEY OPEN 10/15-10/25



SURVEY RESULTS

Q2 How much time do you spend in Camden, Maine?

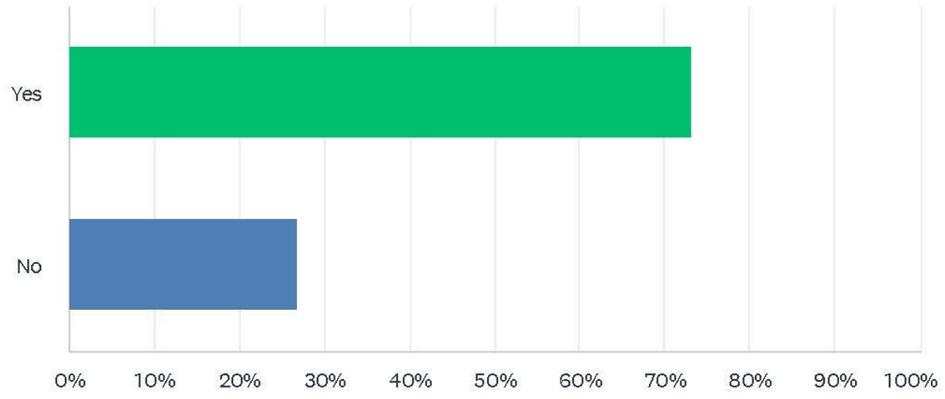
Answered: 26 Skipped: 0



SURVEY RESULTS

Q3 Have you attended the October 15th introductory meeting or reviewed the information provided about the project?

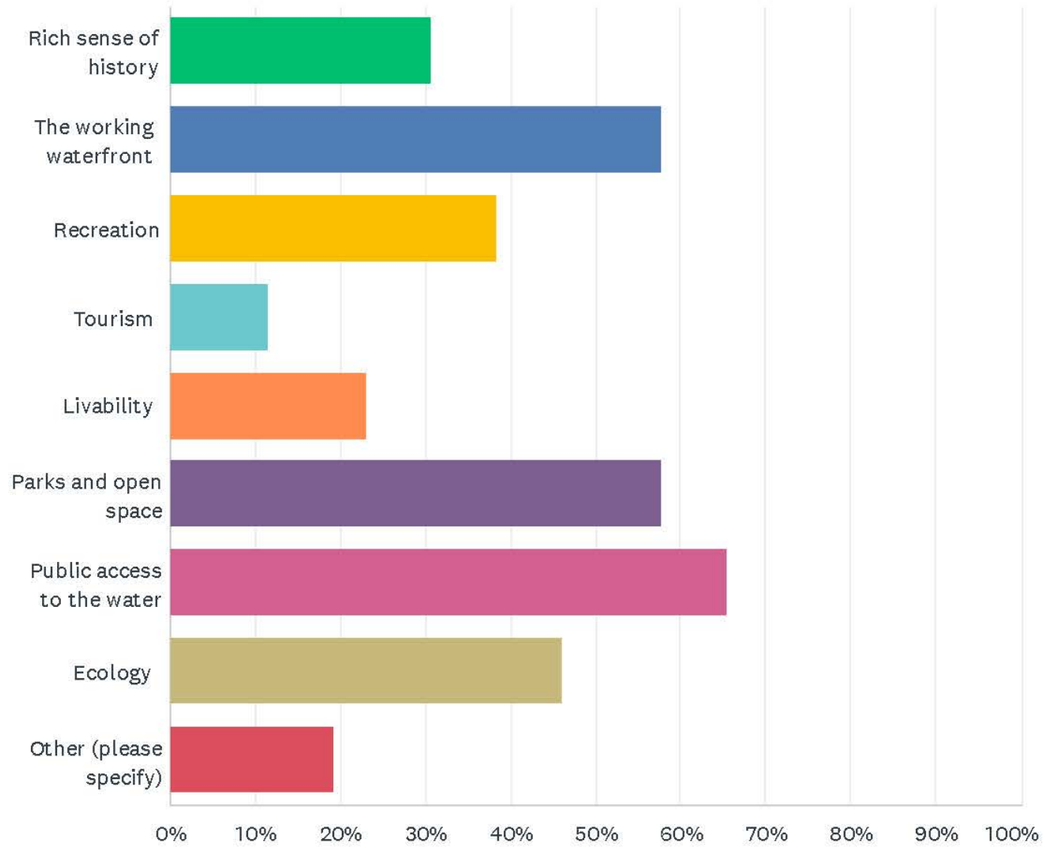
Answered: 26 Skipped: 0



SURVEY RESULTS

Q4 What aspects of Camden's inner harbor do you value most? (select your top 3)

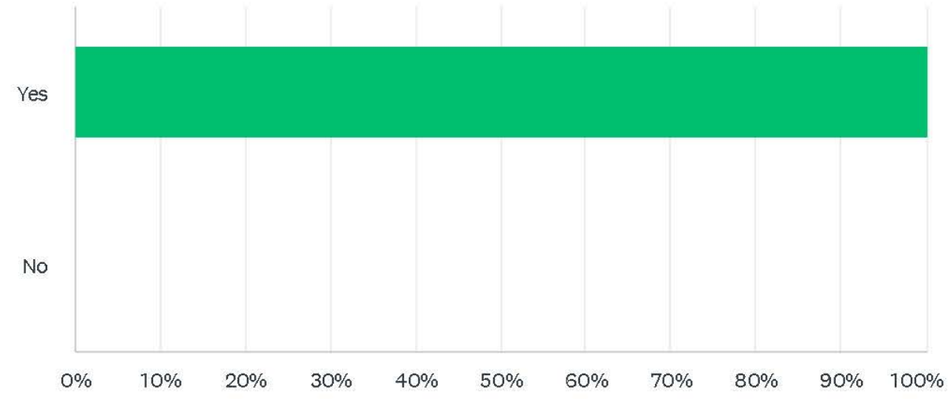
Answered: 26 Skipped: 0



SURVEY RESULTS

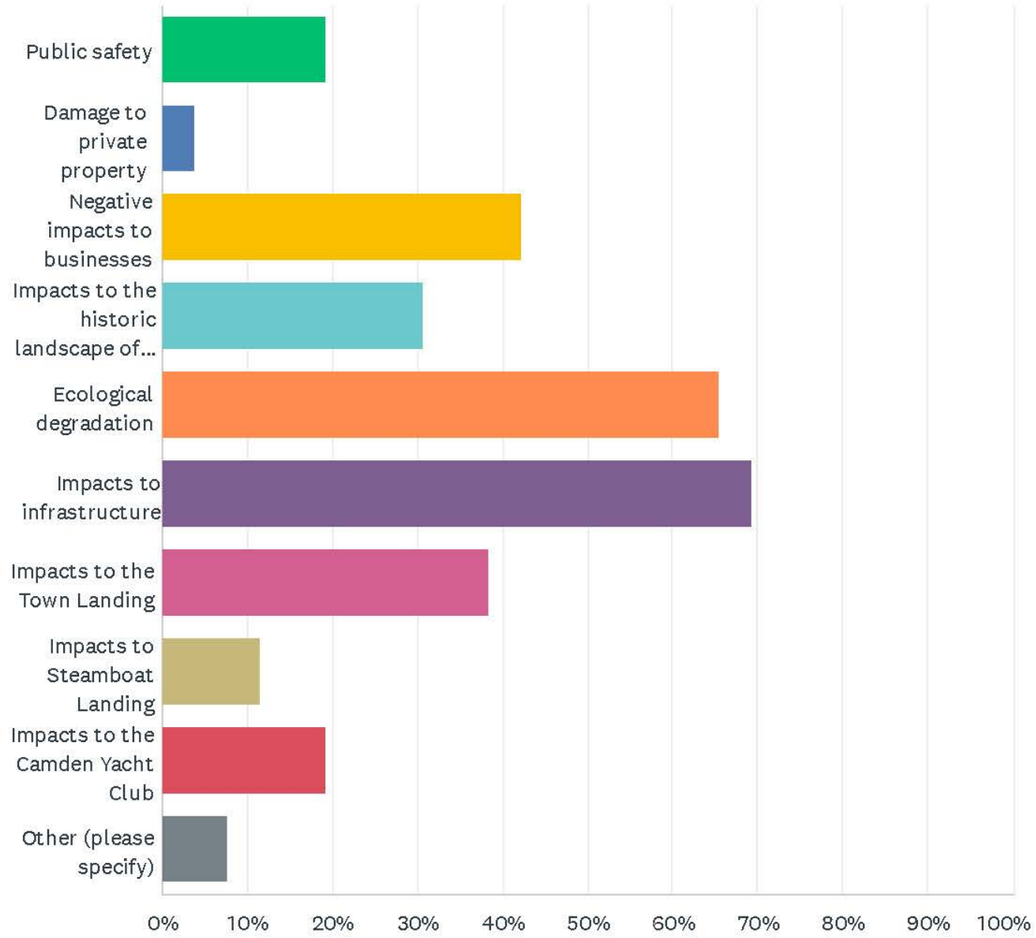
Q5 Are you in favor of taking proactive measures to make the inner harbor more resilient to flooding than it is today?

Answered: 26 Skipped: 0



Q6 What potential flood impacts concern you most around Camden's Inner Harbor? (select your top 3)

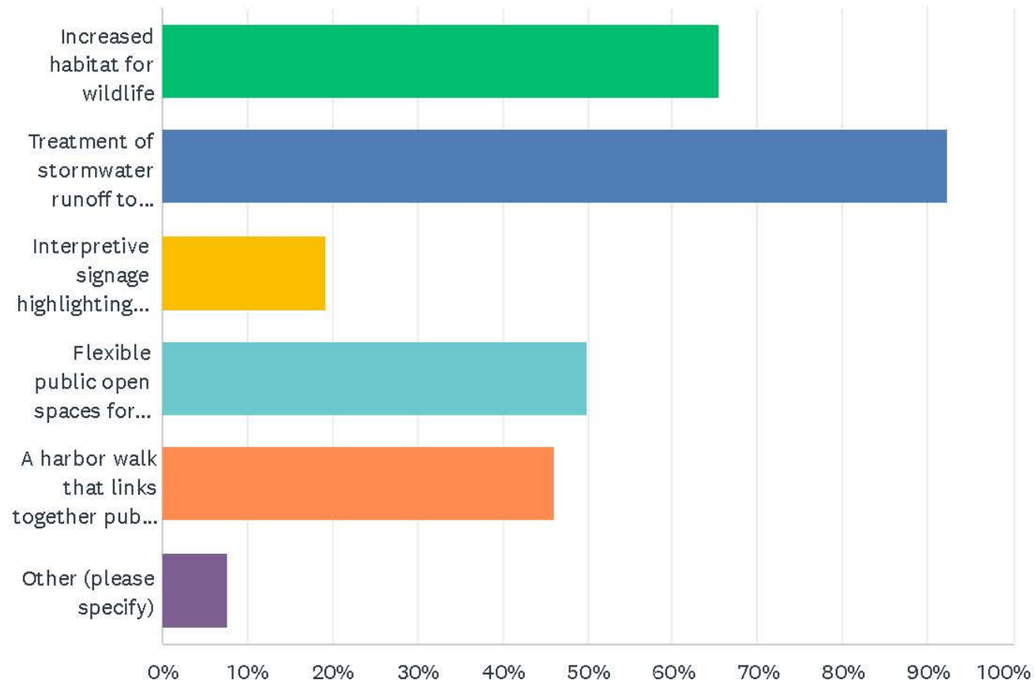
Answered: 26 Skipped: 0



SURVEY RESULTS

Q7 The most wholistic resilience planning projects incorporate additional co-benefits that complement flood resilience and add more value. Which of these potential co-benefits would you like to see incorporated? (select your top 3)

Answered: 26 Skipped: 0



SURVEY RESULTS

Q8 Is there anything else you wish to share related to flood resilience at Camden's inner harbor?

Answered: 17 Skipped: 9

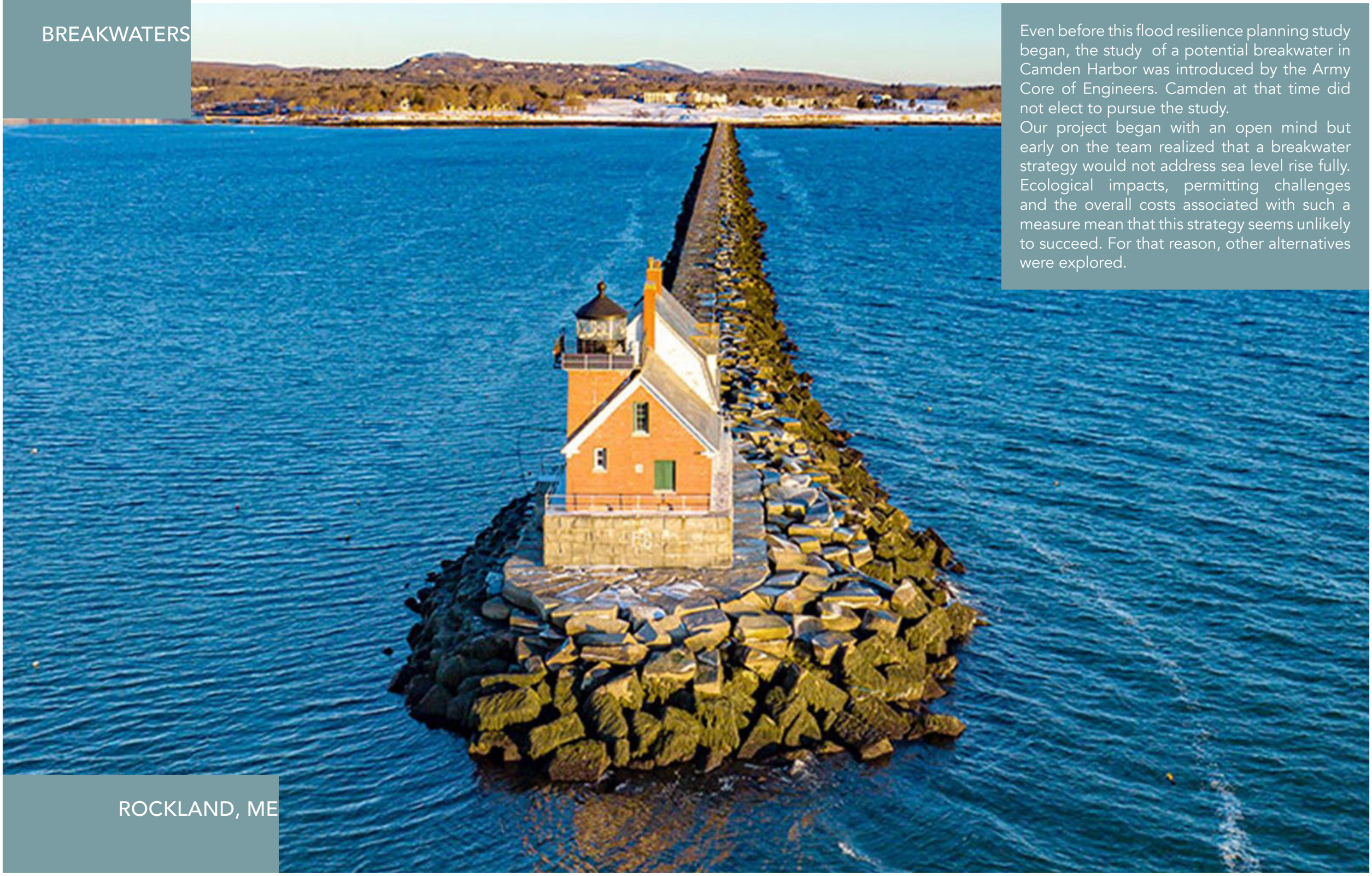
#	RESPONSES	DATE
1	It seems important to verify what assumptions are behind the projected sea level/storm surge numbers the planning is based on. What increases of greenhouse gases over what period, and what other phenomena are factored in? The models for these things exist of course, so those paying for the project should be made aware of the degree of certainty the planners have, and likewise the reliability of the assumptions. This is also useful for public policy purposes + voter education!	12/2/2024 9:54 AM
2	We hope that whatever measures are taken to protect the harbor will look forward not just to 5-10yrs but much further into the future. In other words, adding extra height + walls by just a foot or two would seem inadequate.	12/2/2024 9:49 AM
3	I am concerned that only a small # of people provided input. How do we get more people, including the wealthy private land owners involved. They tend to avoid public meetings!!	12/2/2024 9:46 AM
4	I think it's really important to link ecological/habitat benefits to infrastructure protection. It's definitely important to incorporate nature-based solutions into whatever plan is devised, and to not do so would be a huge missed opportunity... Also, the resilience messaging should really make sure to highlight the economic benefits of choosing nature based solutions, not just because of the reduced damage to infrastructure, but also because there is absolutely an economic benefit to ecological enhancement (ESPECIALLY in a town like Camden, where we pride ourselves in our natural resource and where tourists visit because the landscape is so beautiful), even if the economic benefit of enhanced habitat it not as directly measurable as damage to infrastructure. It's also crucial to highlight the economic costs of ecological damage as well as the economic benefits of improving ecological function. Humans are part of the ecosystem and ecological enhancements benefit us too. (I wish more people found inherent value in enhancing habitat for other animals, but it seems like people are ultimately motivated by cost and how things will benefit us)	11/5/2024 4:02 PM
5	We either do this with forethought, or we do it after disaster strikes.	11/5/2024 3:46 PM
6	I think this is a wonderful opportunity to not just make the harbor more resilient to climate change, but also give a big boost to wildlife and biodiversity and create opportunities for humans to connect to nature. I would love to see migrating fish (and the birds they attract) moving up the falls! I also would love to see a waterfront with more habitat, native plants, and walking trails, footbridges, and other public infrastructure that serves humans instead of cars.	10/24/2024 3:00 PM
7	Looking forward to seeing your ideas!	10/23/2024 9:36 PM
8	The harbor, with it's waterfall and active commerce, is the heart of Camden and must be preserved!	10/23/2024 8:03 AM
9	Thank you so very much for your very informative, transparent, and engaging Camden Harbor resiliency planning. We plan to become regular participants in this critical local initiative.	10/23/2024 8:03 AM
10	The town i(population of) s still only partially aware of the the track climate change is on, so implementing anything will still be difficult. However, the planning should help us in the future as our awareness grows.	10/23/2024 6:59 AM

SURVEY RESULTS

11	I appreciate that you are starting early to look for public input. Proponents of some other projects in Camden did not do that, and they lost much public support as a result. So thank you!	10/22/2024 4:22 PM
12	in my dream world we rethink the use of public landing for parking and reconsider all the ways these water-facing spaces can become oasis of calm and ecological repair...and access to multiple ways the public can get on the water...pie in the sky, I know...	10/22/2024 8:17 AM
13	I think this idea of creating purposefully floodable areas is so intriguing. I look forward to working with you all to make Harbor Park more resilient for future generations.	10/17/2024 10:33 AM
14	I'm really appreciating the greenscaping co-benefits especially that they get more resilient over time. Also regenerating living systems seems to me the most critical long term resilience work we can do, especially when anticipating energy descent and overshoot scenarios. Link harbor work with regenerative River work that brings back fish and heals the biome. Let's use some financial capital to rebuild our natural and cultural capital. While also keeping Camden a working waterfront ensuring sustainable livelihoods. Thanks for your inspiring work!	10/15/2024 7:52 PM
15	Keep up the momentum!!!!!	10/15/2024 7:52 PM
16	Thank you for your work	10/15/2024 7:37 PM
17	I wonder where the money will come from to make needed changes.	10/15/2024 7:28 PM

FLOOD RESILIENCE ALTERNATIVES

BREAKWATERS



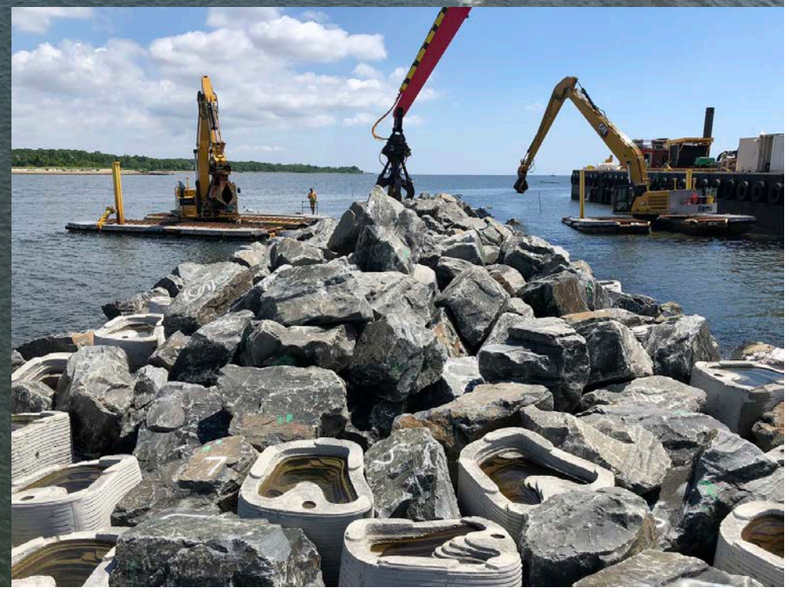
Even before this flood resilience planning study began, the study of a potential breakwater in Camden Harbor was introduced by the Army Core of Engineers. Camden at that time did not elect to pursue the study.

Our project began with an open mind but early on the team realized that a breakwater strategy would not address sea level rise fully. Ecological impacts, permitting challenges and the overall costs associated with such a measure mean that this strategy seems unlikely to succeed. For that reason, other alternatives were explored.

ROCKLAND, ME

LIVING BREAKWATERS

In some communities, living breakwaters that incorporate some degree of ecological benefit are being trialed. While these measures may help address storm surge, they too do not address rising sea levels. Additionally, these are also costly to construct and may adversely impact the ecology and hydrology in the marine environments where they are introduced. For this reason, the team looked into alternative strategies.



STATEN ISLAND, NY
SCAPE

WAVE ATTENUATION

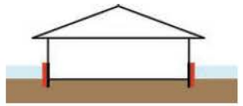
Floating wave attenuating dock systems have been used to lessen wave energy in harbors in Maine and elsewhere. These do not address sea level rise. In order to maintain free movement of boat traffic to and from the inner harbor this strategy is not recommended.

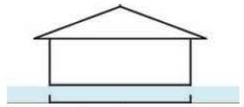
SPRING POINT MARINA
CASCO BAY, ME

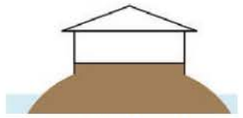
Tool kit

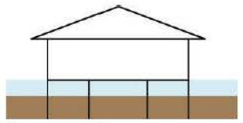
In the absence of an reasonable "silver bullet" flood resilience mega-structure, the team pivoted to looking at a wide array of localized resilience strategies shown in this tool kit. These strategies offer an ability to match the right tool to each specific condition that exists within the inner harbor. They may be implemented incrementally over time as funds allow and needs arise.

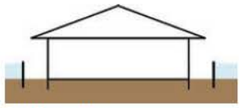
SITE

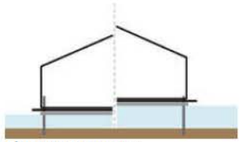

Dry Floodproofing

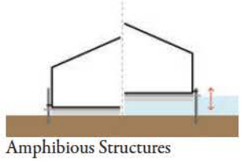

Wet Floodproofing


Elevate on Fill or Mound


Elevate on Piles


Site Protection

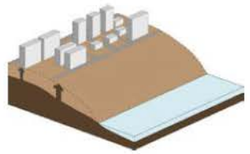

Floating Structures


Amphibious Structures

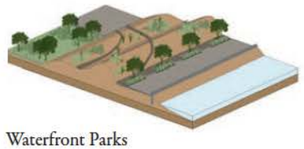

Building System Protection

REACH

UPLAND


Elevation of Land and Streets


Floodwalls


Waterfront Parks


Strategic Retreat

OTHER

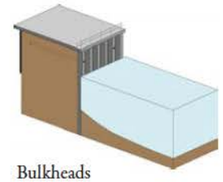
Emergency Management

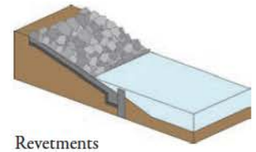
Insurance

Land Use Management

Infrastructure Protection

SHORELINE


Bulkheads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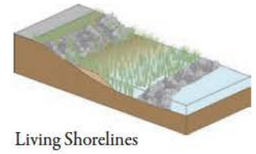
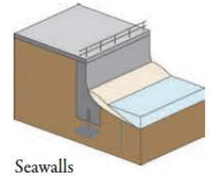
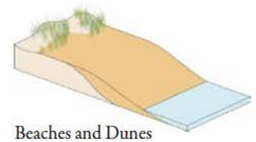
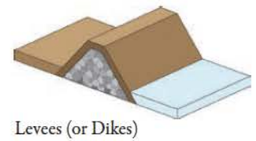

Living Shorelines

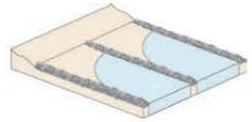

Seawalls

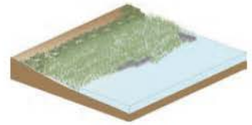

Beaches and Dunes


Levees (or Dikes)


Multi-purpose Levees

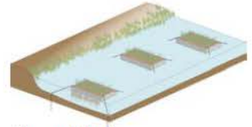
IN-WATER

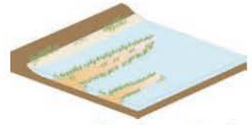

Groins

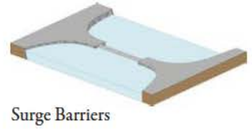

Constructed Wetlands

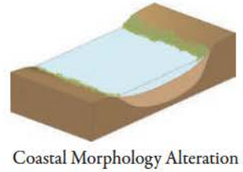

Breakwaters

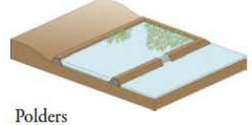

Artificial Reefs


Floating Islands


Constructed Breakwater Islands


Surge Barriers

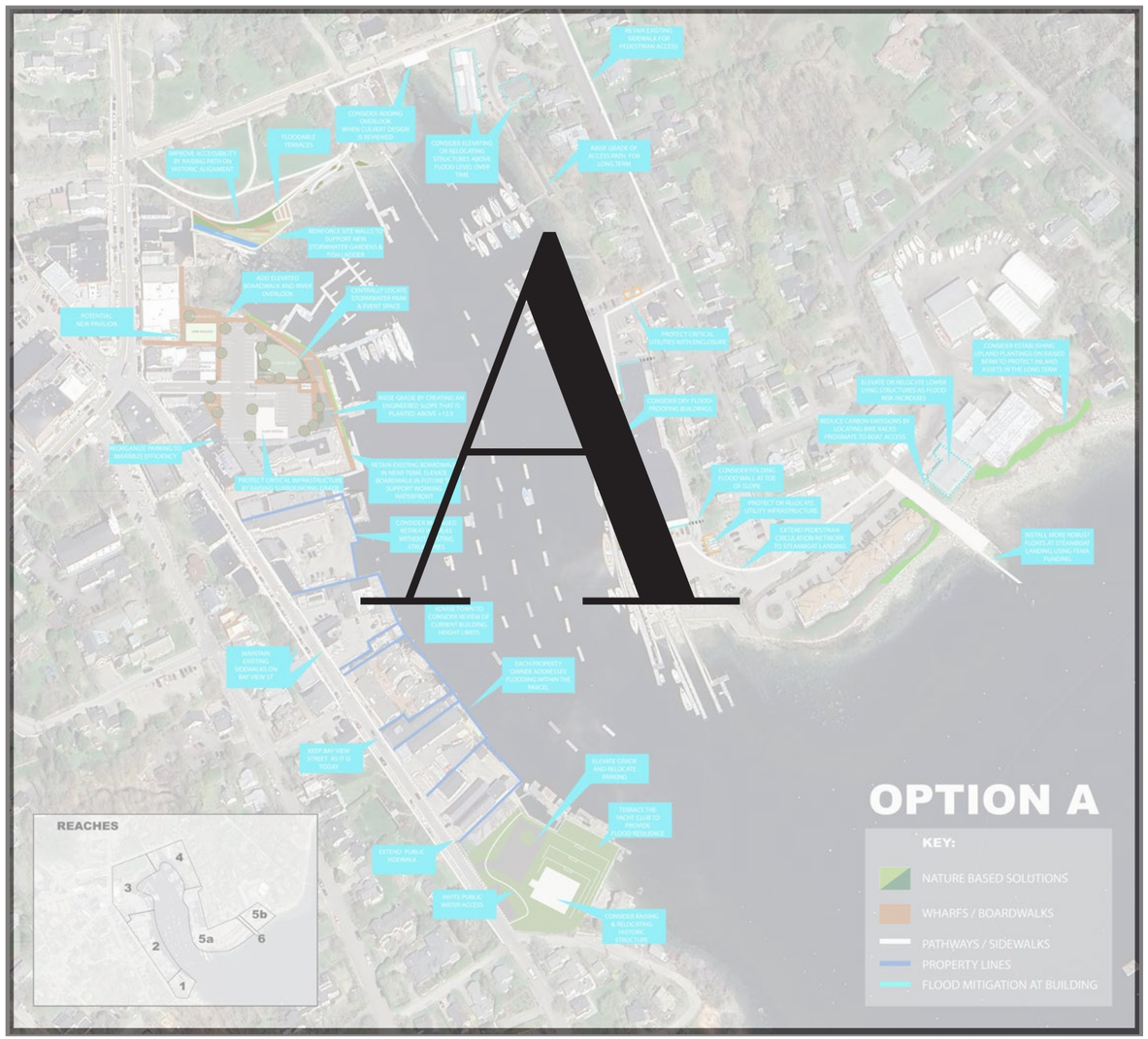

Coastal Morphology Alteration


Polders

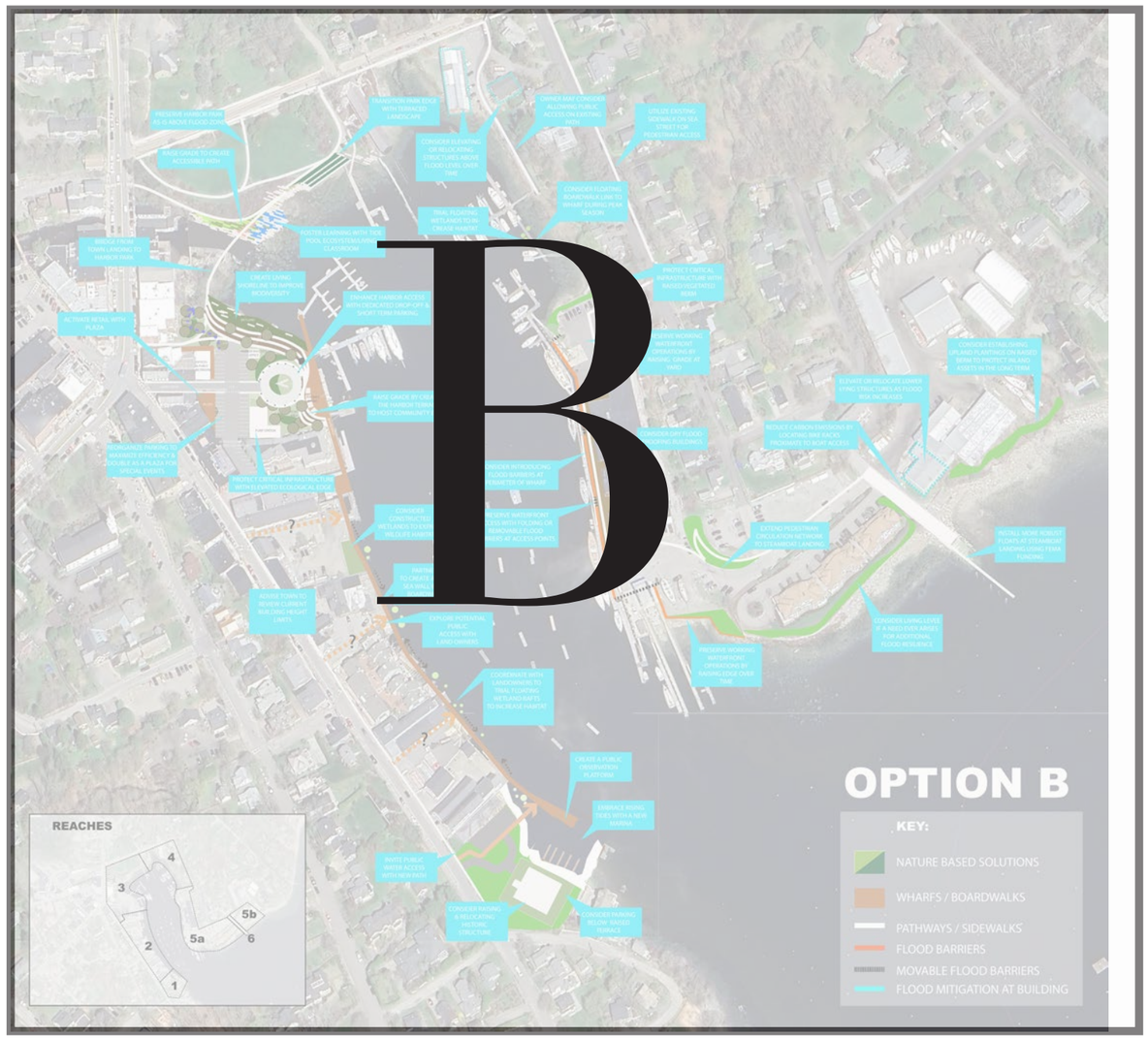
TWO ALTERNATIVE STRATEGIES

Two high-level planning alternatives were developed for the community to review and comment on during the February 5th workshop. These concept alternatives are discussed in greater detail in the following pages.

Option A: Individualistic Adaptation and Mitigation:
This option emphasizes a decentralized approach, where adaptation and mitigation measures are implemented on an individual property within each lot boundary.



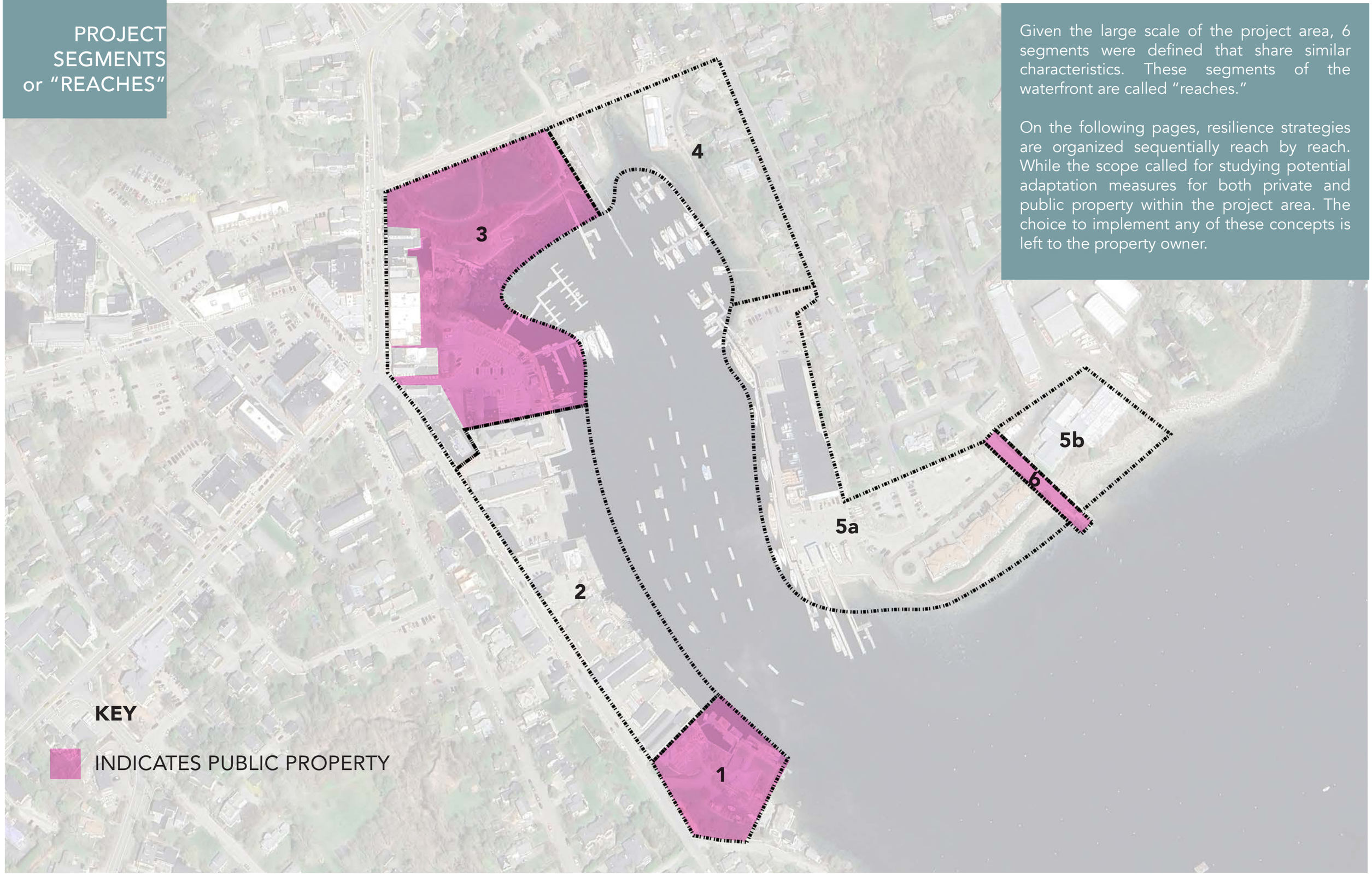
Option B: Collaborative Partnership Strategy:
This option promotes a collaborative, community-wide strategy, where partnerships are formed to implement resilience measures that provide more benefits.



PROJECT SEGMENTS or "REACHES"

Given the large scale of the project area, 6 segments were defined that share similar characteristics. These segments of the waterfront are called "reaches."

On the following pages, resilience strategies are organized sequentially reach by reach. While the scope called for studying potential adaptation measures for both private and public property within the project area. The choice to implement any of these concepts is left to the property owner.



REACH 3

HARBOR PARK

TOWN LANDING

Reach 3 encapsulates the Town Landing and Harbor Park on either side of the Megunticook River.

The Town Landing functions as a core part of the working waterfront and the goal is to look at adaptation measures that facilitate business operations and enhance the public realm by mitigating flood risk.

Given the historic importance of Harbor Park, the goal has been to sensitively incorporate resilience measures that preserve the majority of the park as it is today. At the same time, some modifications will be necessary to allow the park to function as sea levels rise. The goal is to follow the guiding principles established by the Library (refer to appendix for more details).

REACH 3 EXISTING CONDITIONS

Storm damage at Harbor Park and the Town Landing have necessitated investment to patch and repair assets after storms. To break the cycle of ongoing maintenance costs, this effort is looking at planning alternatives to modify these lands in a manner that addresses rising tides and increasing storm severity through proactive design modifications.

REACH 3 FLOOD MAP

This flood map indicates the projected extent of inundation by incorporating both sea level rise and storm surge. The three colors correspond with three time horizons: 2030, 2050 and 2100.

If no action is taken, the assets on the harbor side of these lines are projected to flood. This would put critical infrastructure such as the pump station at the Town Landing at risk. In addition, much of the parking area at the Town Landing and the lower areas of Harbor Park are at risk of flooding in these scenarios unless resilience measures are put in place.

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TOWN LANDING SITE PLAN

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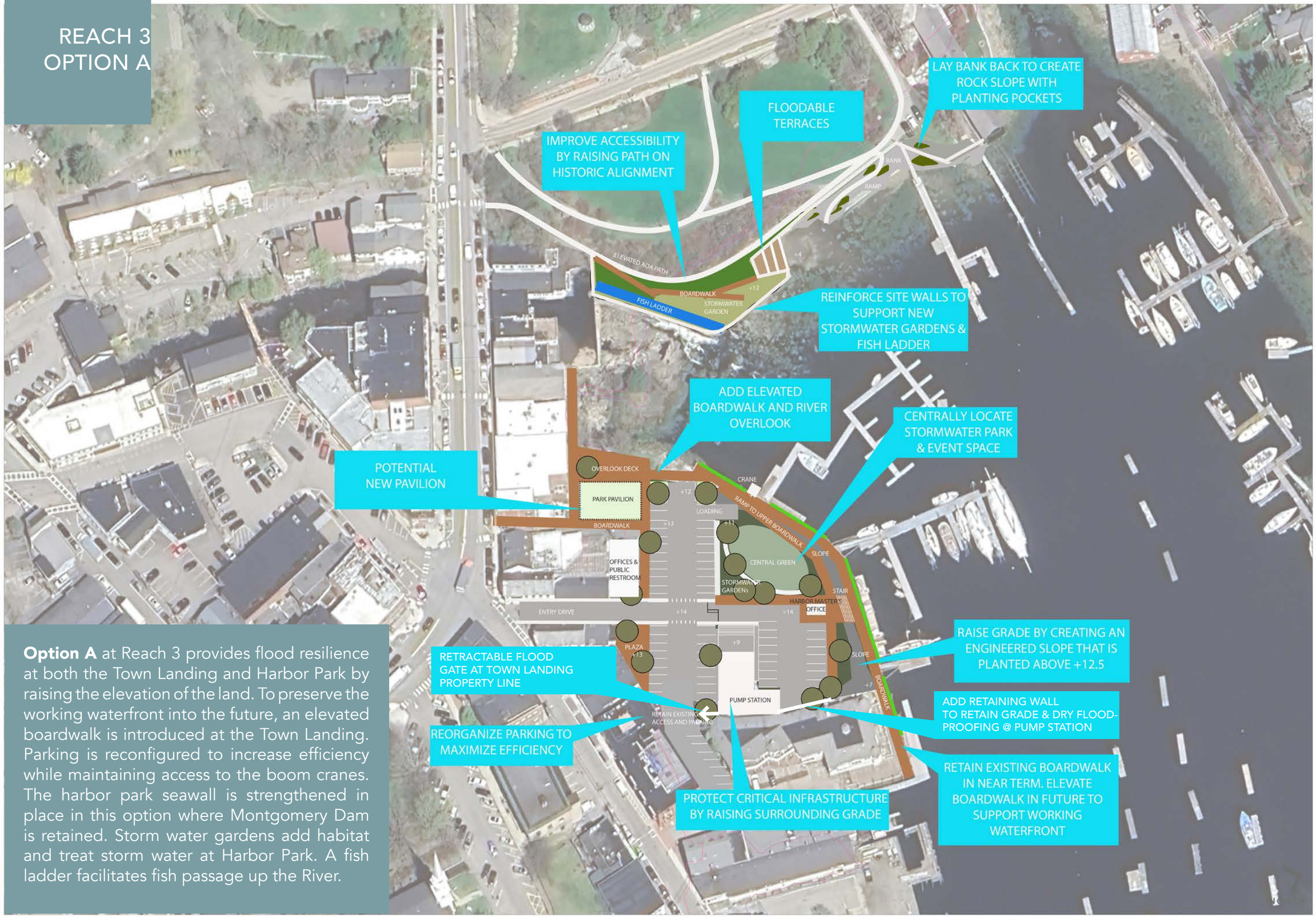
REACH 3
OPTION A



Option A at Reach 3 provides flood resilience at both the Town Landing and Harbor Park by raising the elevation of the land. To preserve the working waterfront into the future, an elevated boardwalk is introduced at the Town Landing. Parking is reconfigured to increase efficiency while maintaining access to the boom cranes. The harbor park seawall is strengthened in place in this option where Montgomery Dam is retained. Storm water gardens add habitat and treat storm water at Harbor Park. A fish ladder facilitates fish passage up the River.

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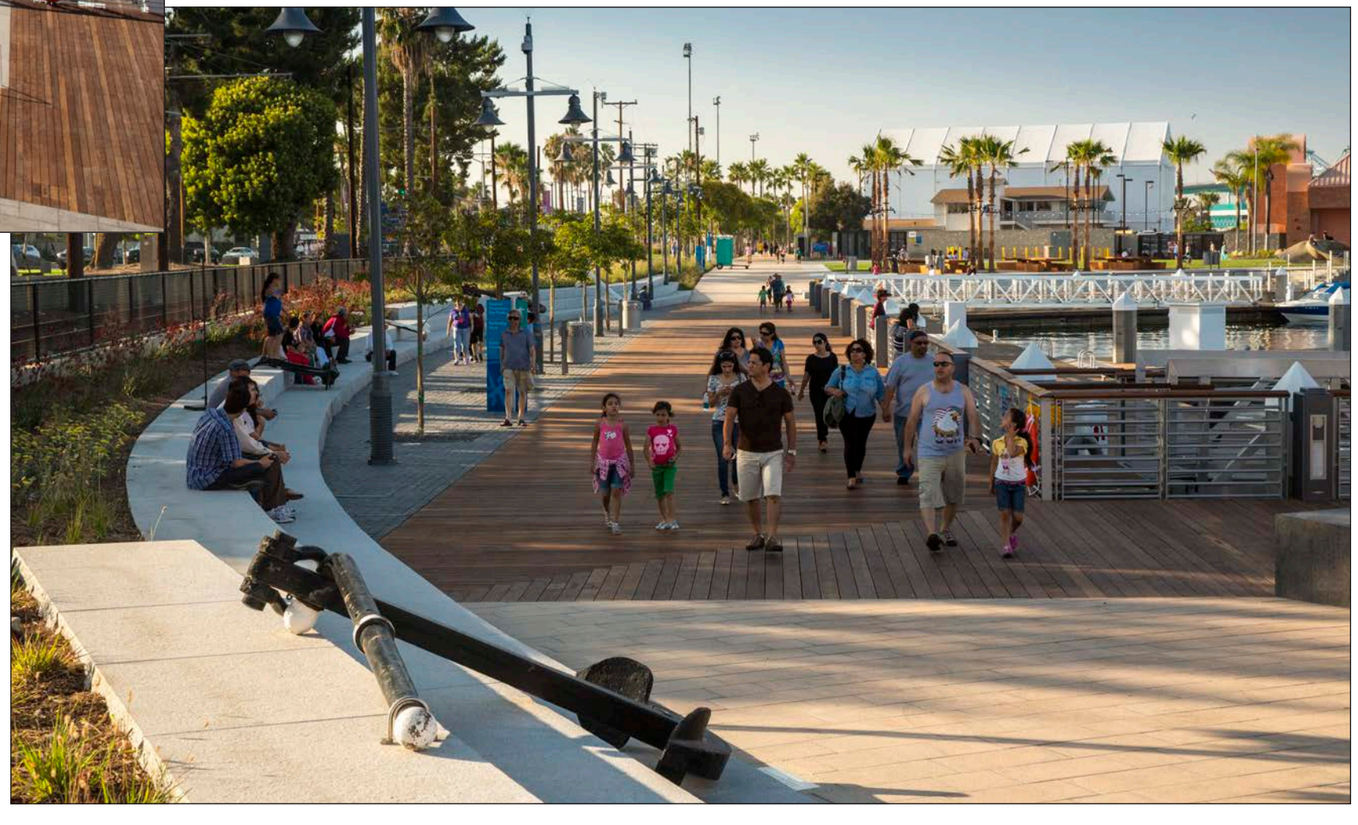
REACH 3 EXISTING CONDITIONS

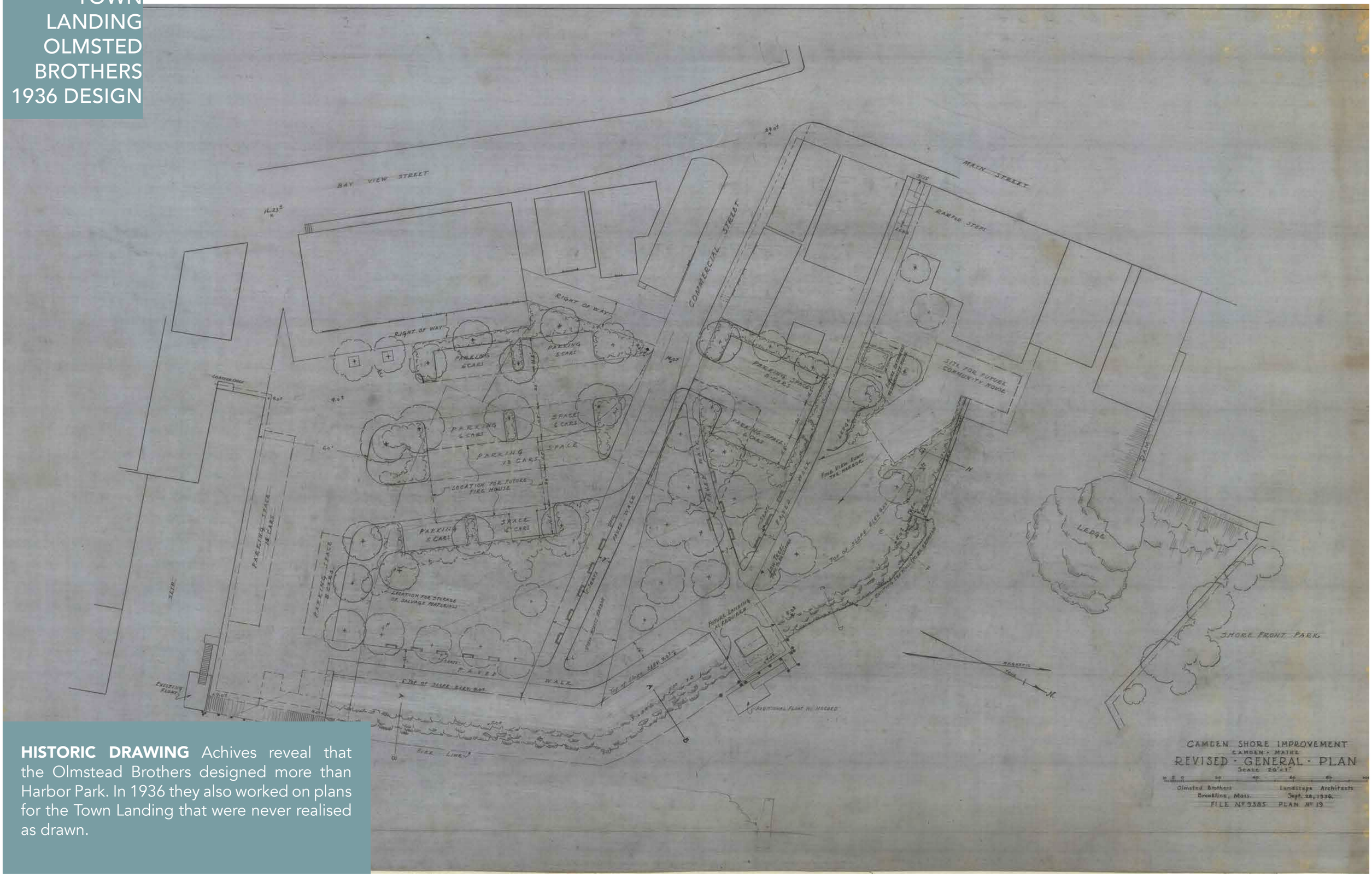
REACH 3
OPTION A

REACH 3 OPTION A CHARACTER IMAGES



Option A at Reach 3 proposes a network of wood boardwalks at different elevations to provide public access to the Harbor and working waterfront. These photos show a precedent for the type of character one might expect in Option A for Reach 3.

TOWN LANDING OLMSTED BROTHERS 1936 DESIGN

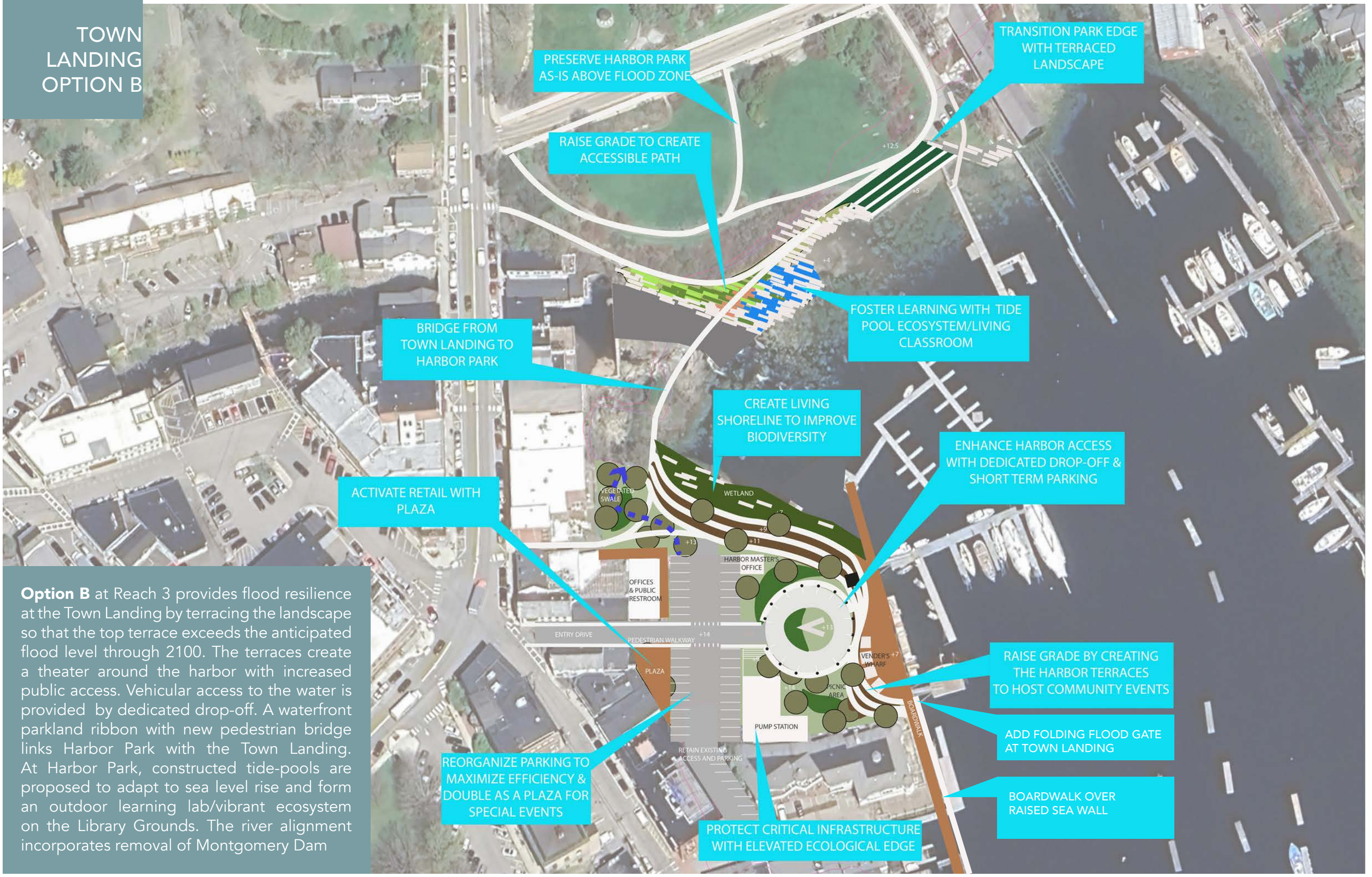


HISTORIC DRAWING Achives reveal that the Olmstead Brothers designed more than Harbor Park. In 1936 they also worked on plans for the Town Landing that were never realised as drawn.

TOWN LANDING OLMSTED BROTHERS 1936 DESIGN

COLOR OVERLAY To help illustrate the Olmsted Brothers sketch, we added color over their line work so that the design concept is more clear. Here you can see the idea of a waterfront park "ribbon" with parking concentrated at the heart of the site. Access to the water is provided at key locations.

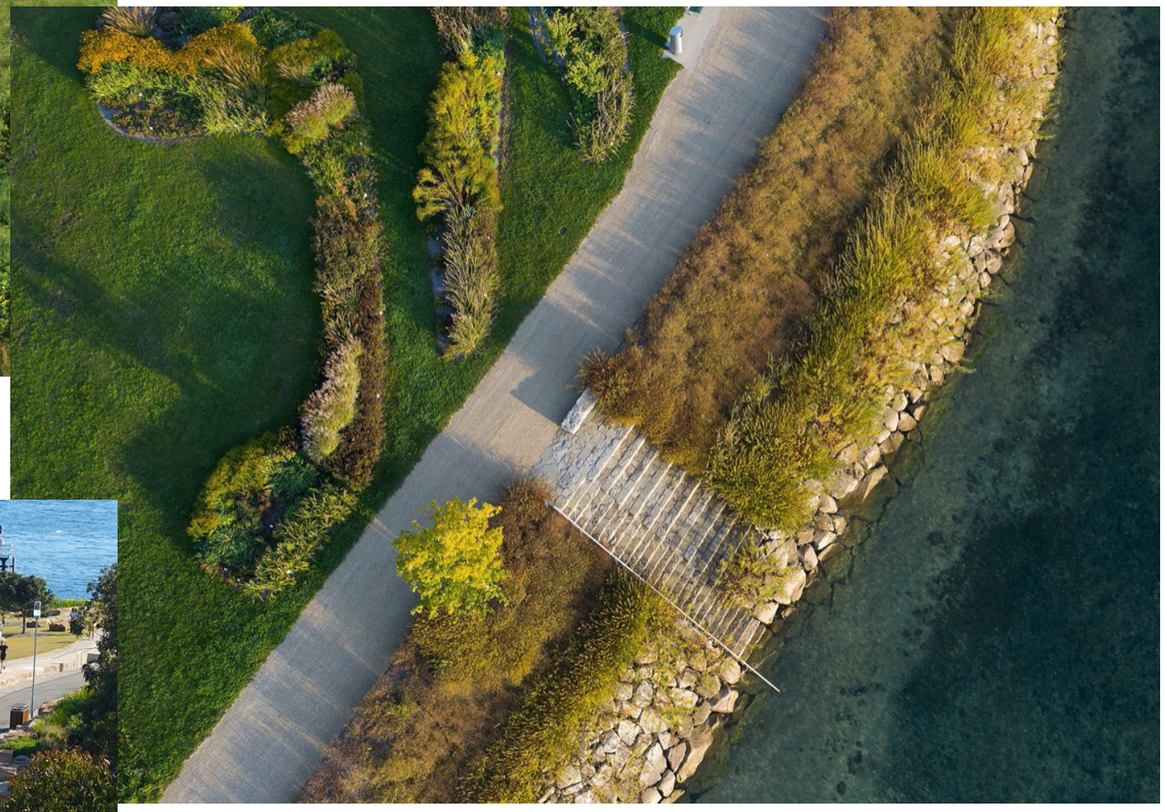
TOWN LANDING OPTION B



Option B at Reach 3 provides flood resilience at the Town Landing by terracing the landscape so that the top terrace exceeds the anticipated flood level through 2100. The terraces create a theater around the harbor with increased public access. Vehicular access to the water is provided by dedicated drop-off. A waterfront parkland ribbon with new pedestrian bridge links Harbor Park with the Town Landing. At Harbor Park, constructed tide-pools are proposed to adapt to sea level rise and form an outdoor learning lab/vibrant ecosystem on the Library Grounds. The river alignment incorporates removal of Montgomery Dam

REACH 3
OPTION B

REACH 3 OPTION B CHARACTER IMAGES



Option B at Reach 3 proposes hybrid flood resilience solutions that integrate nature based adaptation strategies to enhance wildlife habitat and ecological function.

REACH 3
OPTION B
TIDE POOLS

Option B at Reach 3 proposes an innovative approach to addressing sea level rise at the foot of Harbor Park. Constructed tide-pool ecosystems are conceived as a method to protect the existing upland park features without walling the community off from the water.

REACH 3
OPTION B
TIDE POOLS

Option B at Reach 3 would require artfully placing boulders to appear as though the tide-pool ecosystem was always in place. Following in the Olmstead design tradition, there is an opprtunity to employ the expert skills of local Maine craftspeople to execute a "natural" looking composition that is actually designed by humans to mimic nature.

REACHES 1 & 2

Reach 1 consists of the Camden Yacht Club. Reach 2 encompasses privately-owned Bay View Street Properties along the Inner Harbor.

The Camden Yacht Club building is on the National Register of Historic Places and it is in jeopardy during storms today. The club leases the property from the Town through a longterm lease.

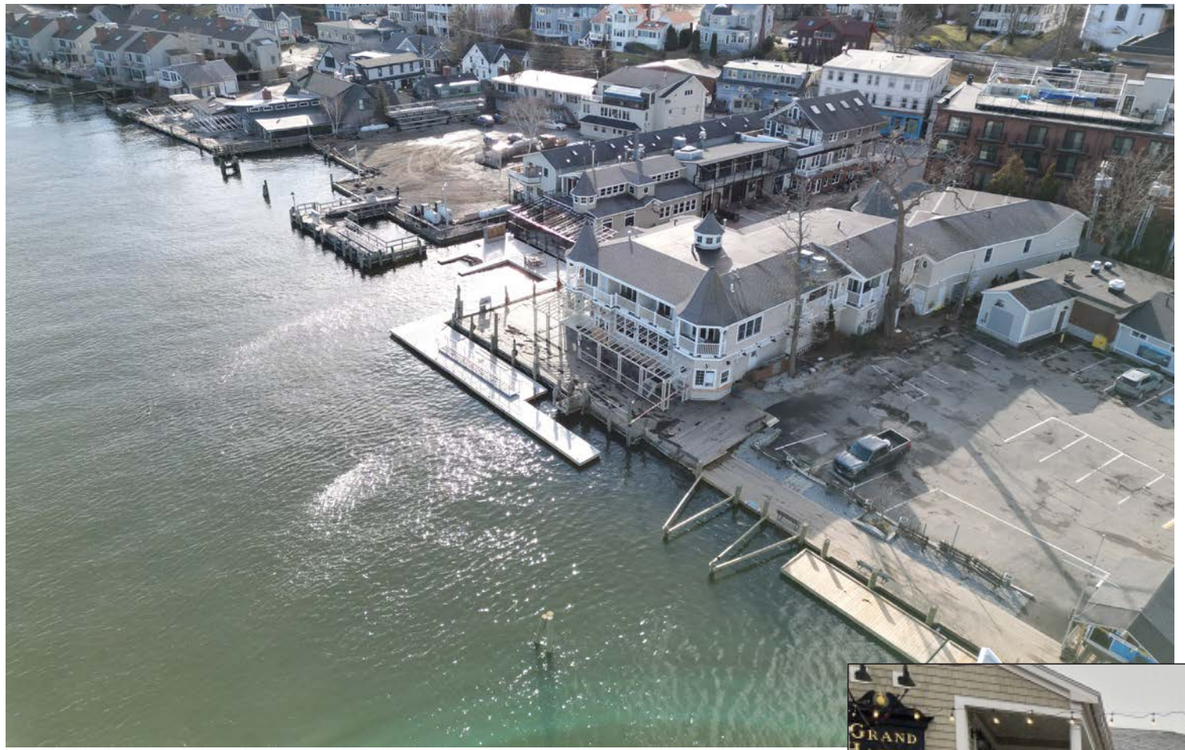
Private residential properties on Bay View Street that share frontage on Camden Harbor are ultimately responsible for managing their assets. The strategies presented on the following pages daylight a wide range of potential flood resilience solutions so that owners may make a more informed decision.

This study also recommends that the Town review potential increased building height limits along the waterfront to provide owners with more latitude to raise structures out of the floodplain over time.

REACH 1 FLOODING JAN 2024

Reach 1 flooding during the January storms in 2024. Clearly the historic building is at risk today and action will need to be taken if preserving this local landmark is a priority.

REACH 2 EXISTING CONDITIONS



Reach 2 flooding has impacted local businesses, residences and infrastructure along Bay View Street in recent storm events. The future outlook projects that these events will continue to escalate as sea levels rise. For this reason, this area is one that requires immediate attention.

REACH 1 & 2 FLOOD MAP

This flood map indicates the projected extent of inundation by incorporating both sea level rise and storm surge. The three colors correspond with three time horizons: 2030, 2050 and 2100.

The projected inundation lines are based on topography. In instances where the building ground floor is raised off the ground, there may already be improved resilience. In most cases, existing structures within Reach 1 & 2 are susceptible to flooding in major storm events today and that is anticipated to get more challenging in the future if no action is taken.

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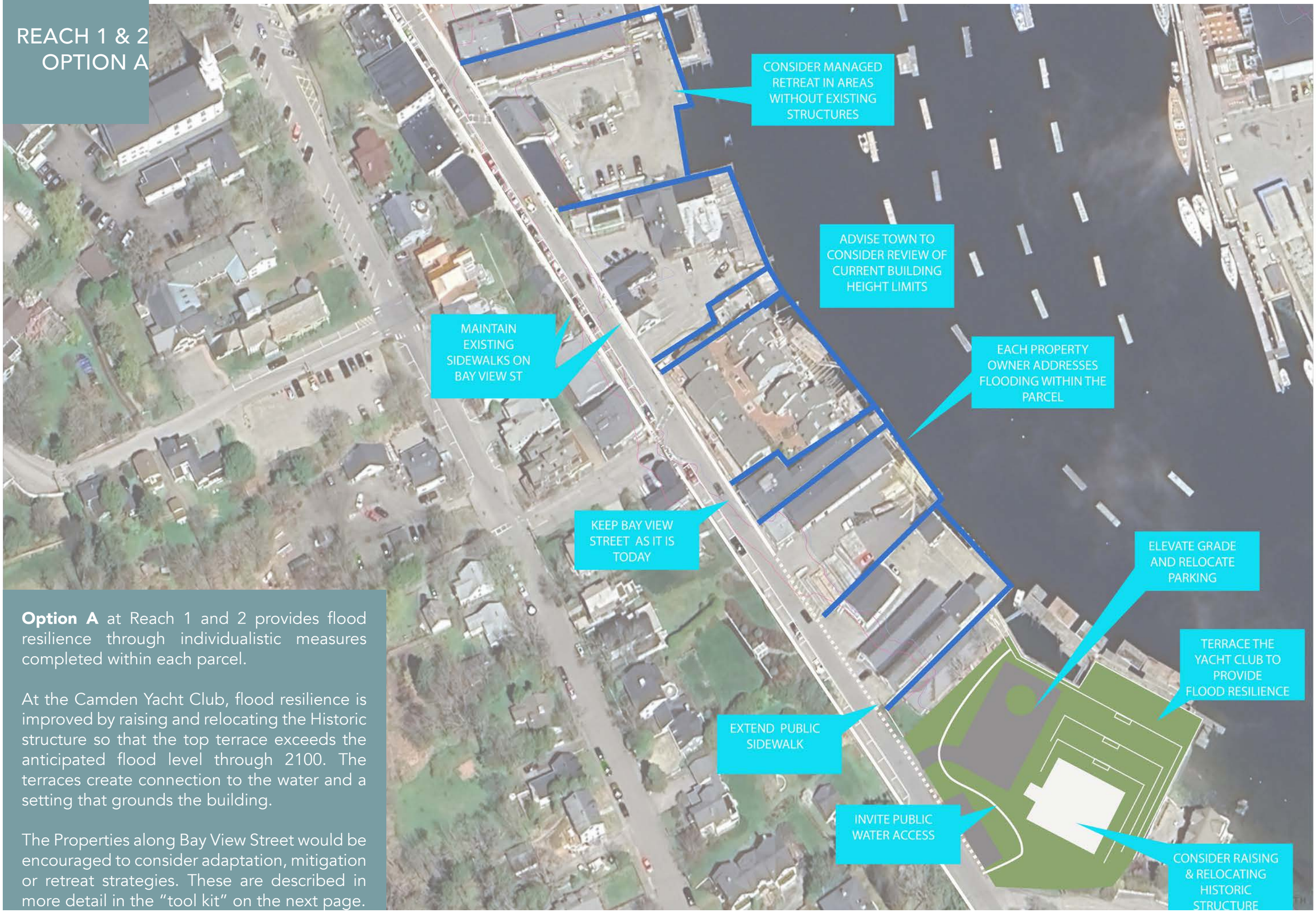
REACH 1 & 2
OPTION A



Option A at Reach 1 and 2 provides flood resilience through individualistic measures completed within each parcel.

At the Camden Yacht Club, flood resilience is improved by raising and relocating the Historic structure so that the top terrace exceeds the anticipated flood level through 2100. The terraces create connection to the water and a setting that grounds the building.

The Properties along Bay View Street would be encouraged to consider adaptation, mitigation or retreat strategies. These are described in more detail in the "tool kit" on the next page.

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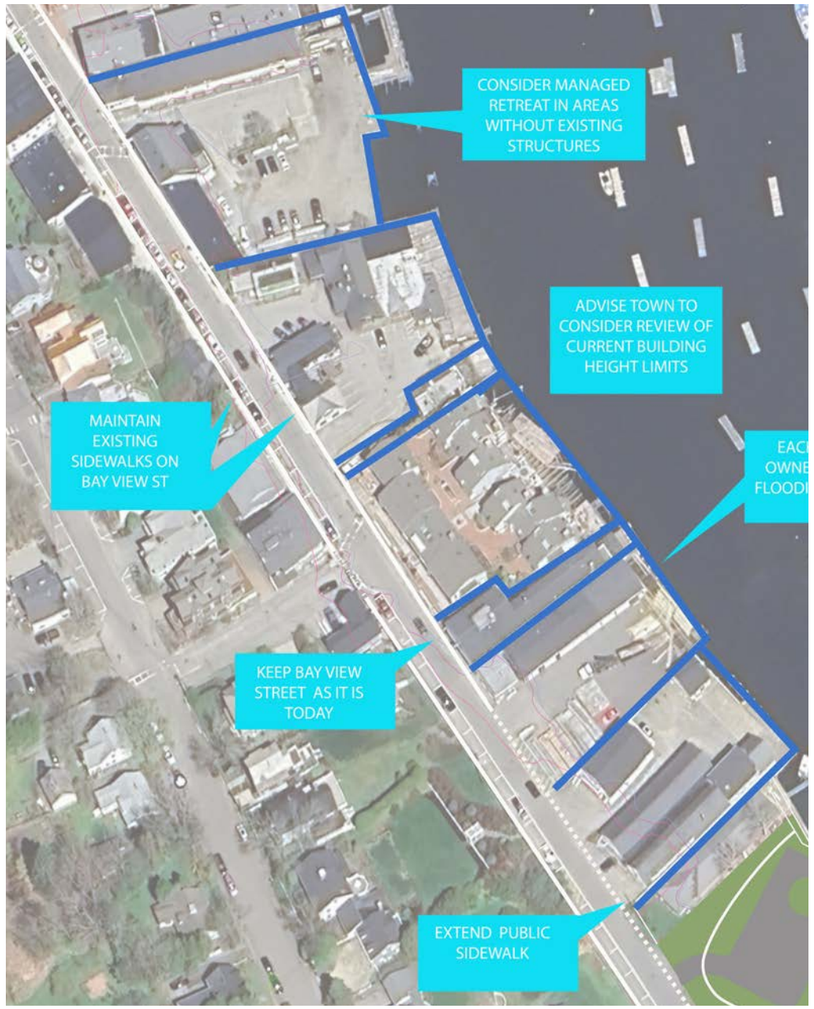
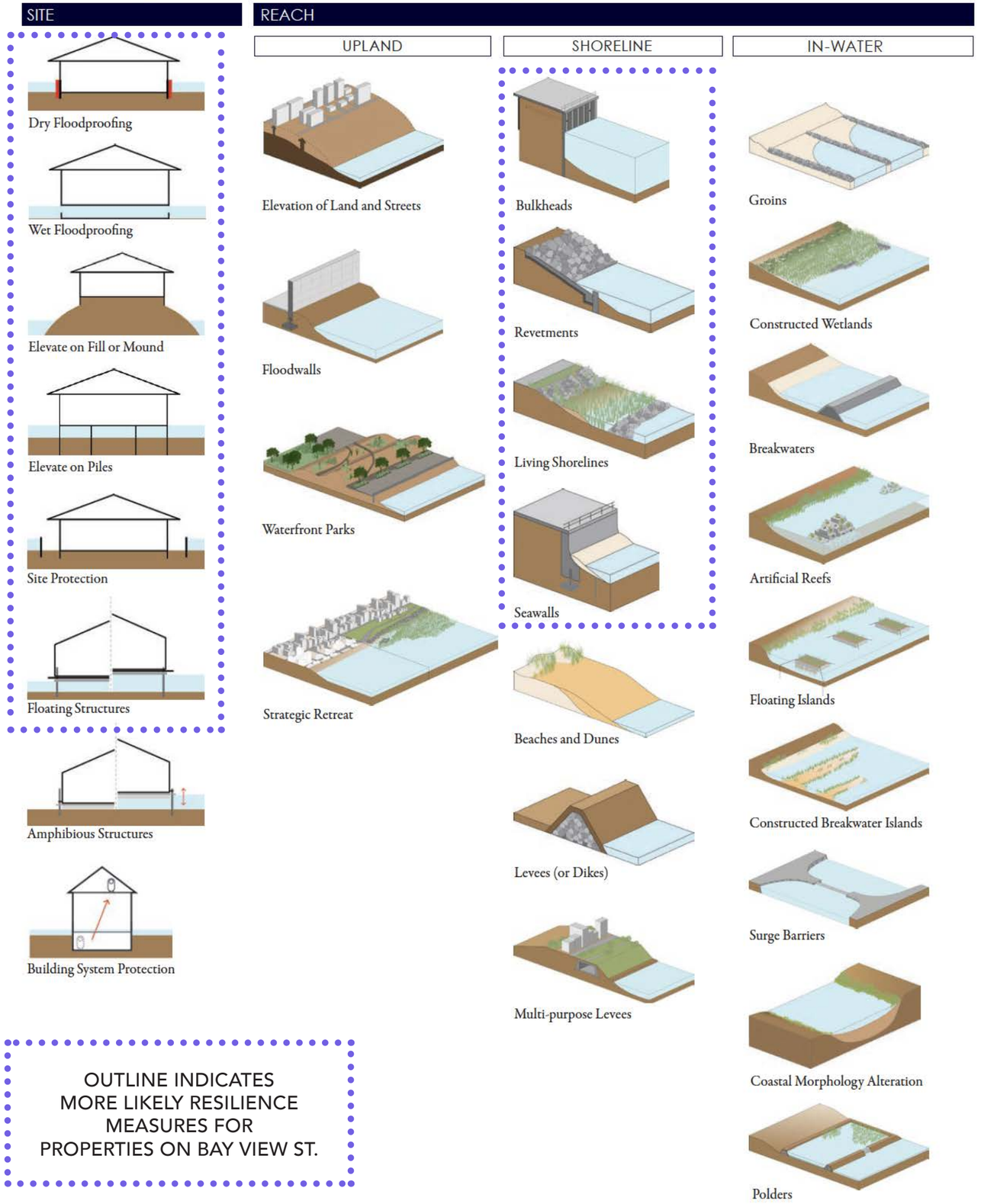
REACH 2 OPTION A TOOL KIT



Option A The owners of properties along Bay View Street would each consider independent adaptation, mitigation or retreat strategies to address flood concerns within their parcel. This may take many different forms as shown in the "tool box" to the right. Hydraulic modeling can be done to demonstrate that proposed resilience measures do not have unintended consequences on surrounding properties.



ELEVATED STRUCTURES

RAISED 3'

SHOREUP GRANT FUNDING (2021): https://www.islandinstitute.org/solutions

There are examples in Maine where historic structures like the Camden Yacht Club have received grant funding to raise buildings above flood levels. This example raises a structure using shoreup funding from the Island Institute.

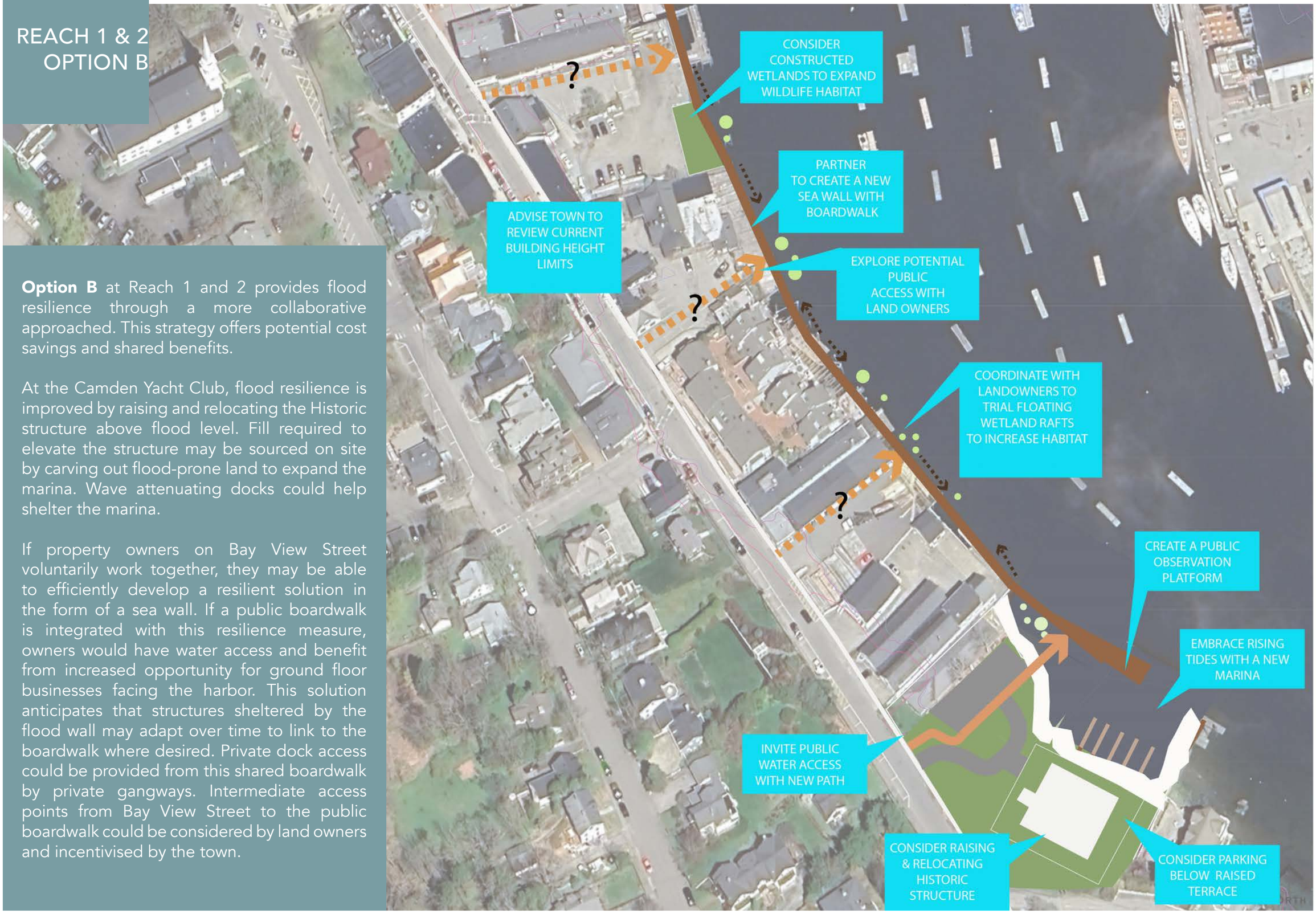
AUDUBON CAMP HOG ISLAND, ME

REACH 1 & 2
OPTION B

Option B at Reach 1 and 2 provides flood resilience through a more collaborative approached. This strategy offers potential cost savings and shared benefits.

At the Camden Yacht Club, flood resilience is improved by raising and relocating the Historic structure above flood level. Fill required to elevate the structure may be sourced on site by carving out flood-prone land to expand the marina. Wave attenuating docks could help shelter the marina.

If property owners on Bay View Street voluntarily work together, they may be able to efficiently develop a resilient solution in the form of a sea wall. If a public boardwalk is integrated with this resilience measure, owners would have water access and benefit from increased opportunity for ground floor businesses facing the harbor. This solution anticipates that structures sheltered by the flood wall may adapt over time to link to the boardwalk where desired. Private dock access could be provided from this shared boardwalk by private gangways. Intermediate access points from Bay View Street to the public boardwalk could be considered by land owners and incentivised by the town.



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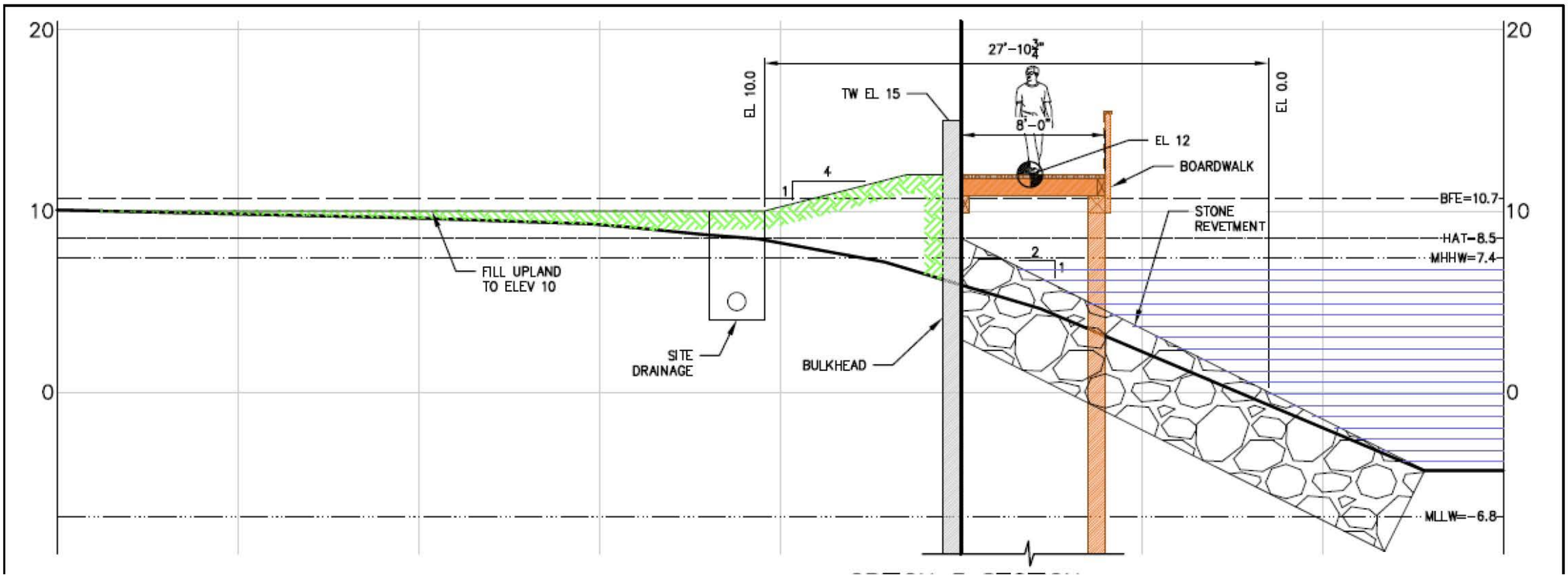
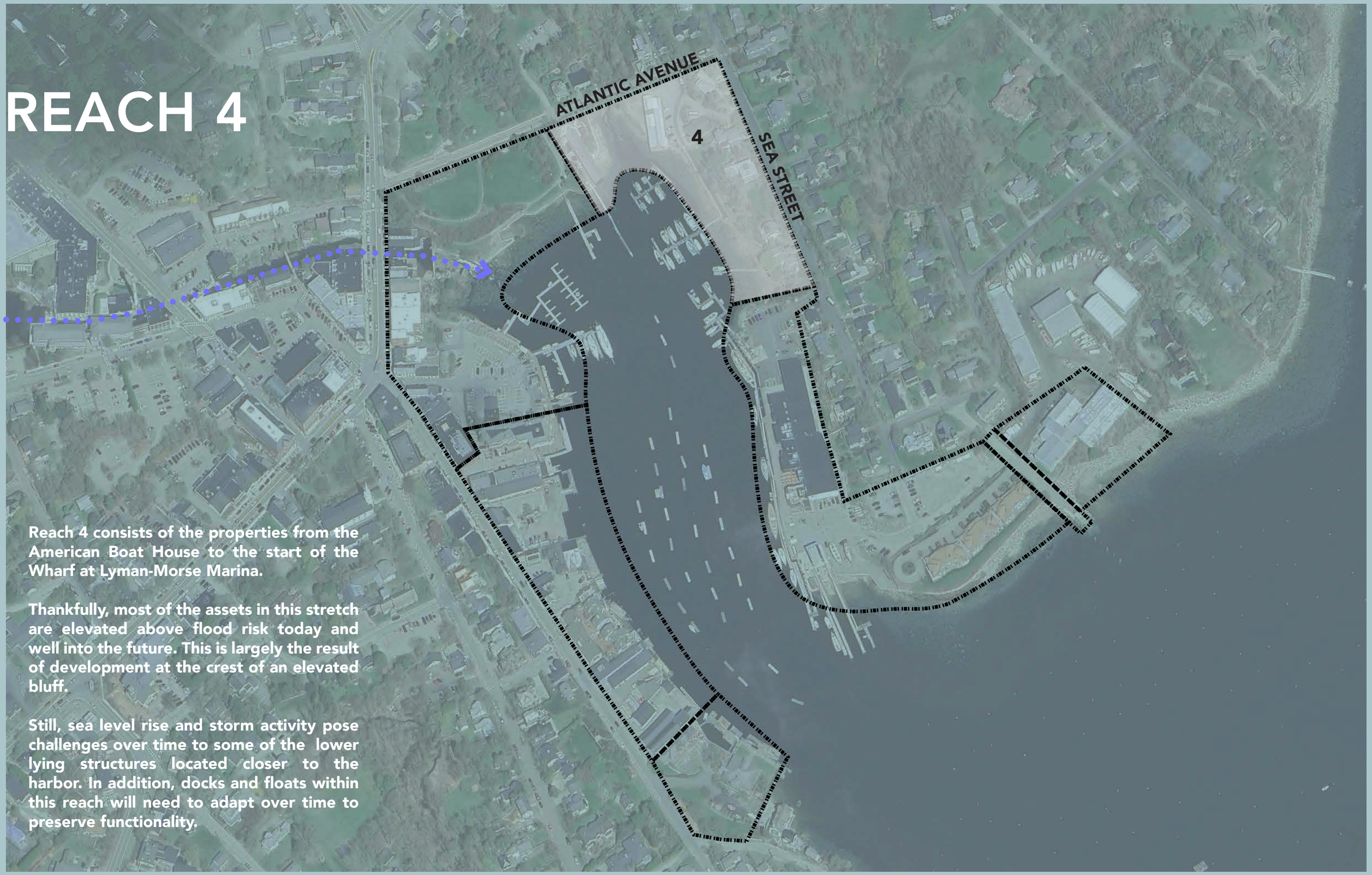
REACH 1 & 2 OPTION B

Below, a representative engineering detail demonstrates one example of how flood resilience may be achieved through a sea wall with integrated boardwalk. While the typology of the flood wall may take many forms, there may be cost savings associated with applying a standard detail across reach 2 if property owners work together.

Already there are examples around the inner harbor where private landowners have incorporated public access to add value to their property as shown at the wharf at Lyman-Morse. If this idea is extended, a harbor "loop" could be incrementally established.



REACH 4

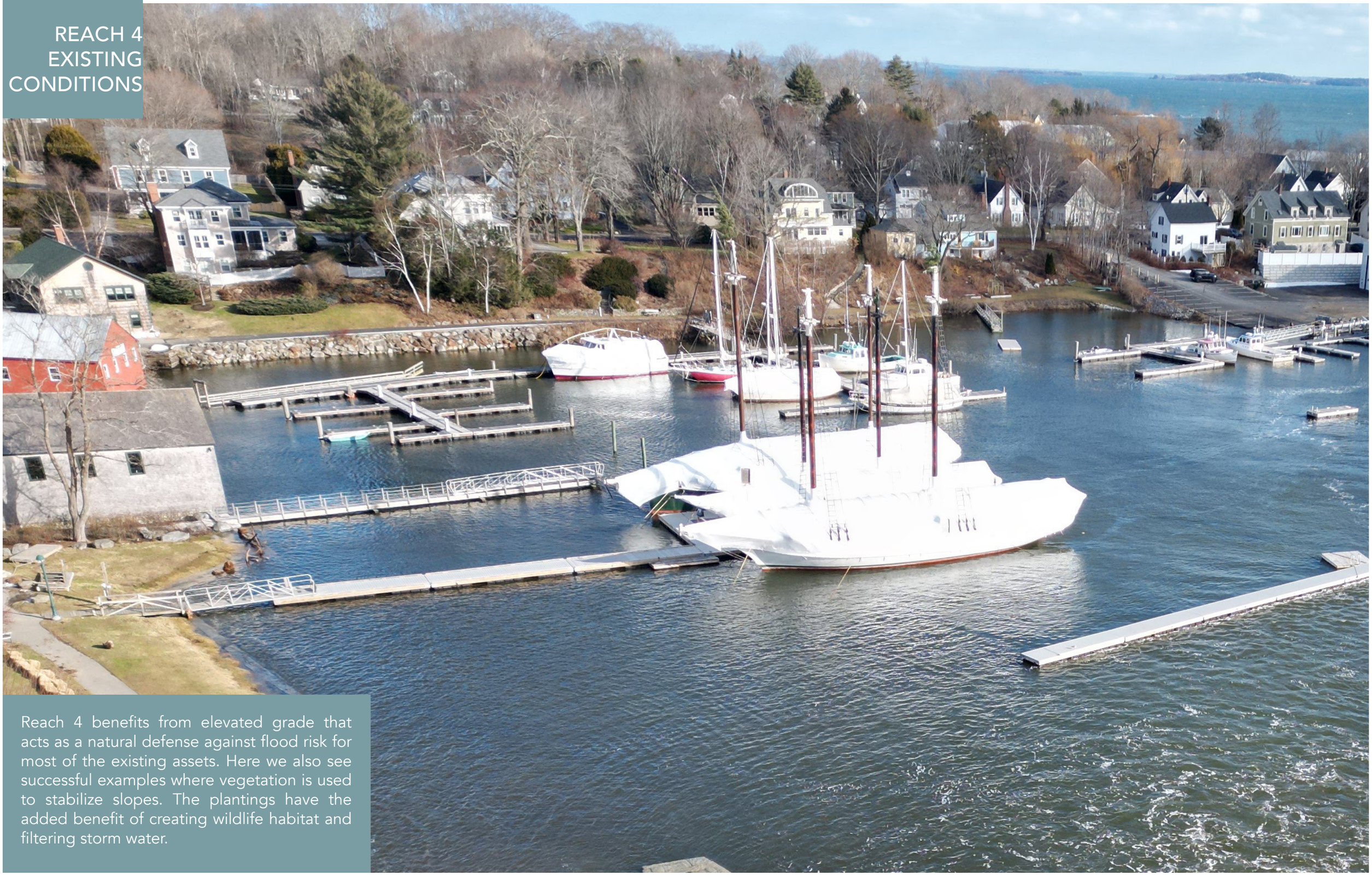


Reach 4 consists of the properties from the American Boat House to the start of the Wharf at Lyman-Morse Marina.

Thankfully, most of the assets in this stretch are elevated above flood risk today and well into the future. This is largely the result of development at the crest of an elevated bluff.

Still, sea level rise and storm activity pose challenges over time to some of the lower lying structures located closer to the harbor. In addition, docks and floats within this reach will need to adapt over time to preserve functionality.

REACH 4 EXISTING CONDITIONS



Reach 4 benefits from elevated grade that acts as a natural defense against flood risk for most of the existing assets. Here we also see successful examples where vegetation is used to stabilize slopes. The plantings have the added benefit of creating wildlife habitat and filtering storm water.

REACH 4 FLOOD MAP

This flood map indicates the projected extent of inundation by incorporating both sea level rise and storm surge. The three colors correspond with three time horizons: 2030, 2050 and 2100.

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	FOR REVIEW	9.13.24

SCALE: 1-40
0 20 40 80

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SEA ST SITE PLAN

CAMDEN HARBOR MASTER PLAN
CAMDEN, ME

L001

REACH 4
OPTION A

Option A at Reach 4 proposes very few changes over time. Only a few of the lowest buildings are susceptible to flooding by 2100. Resilience may be implemented as sea levels rise in the form of dry floodproofing or elevating structures.

The pump station at the corner of the Lyman-Morse Wharf could be protected from longterm flood risk by implementing localized resilience measures such as a vegetated berm.

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SEA ST SITE PLAN

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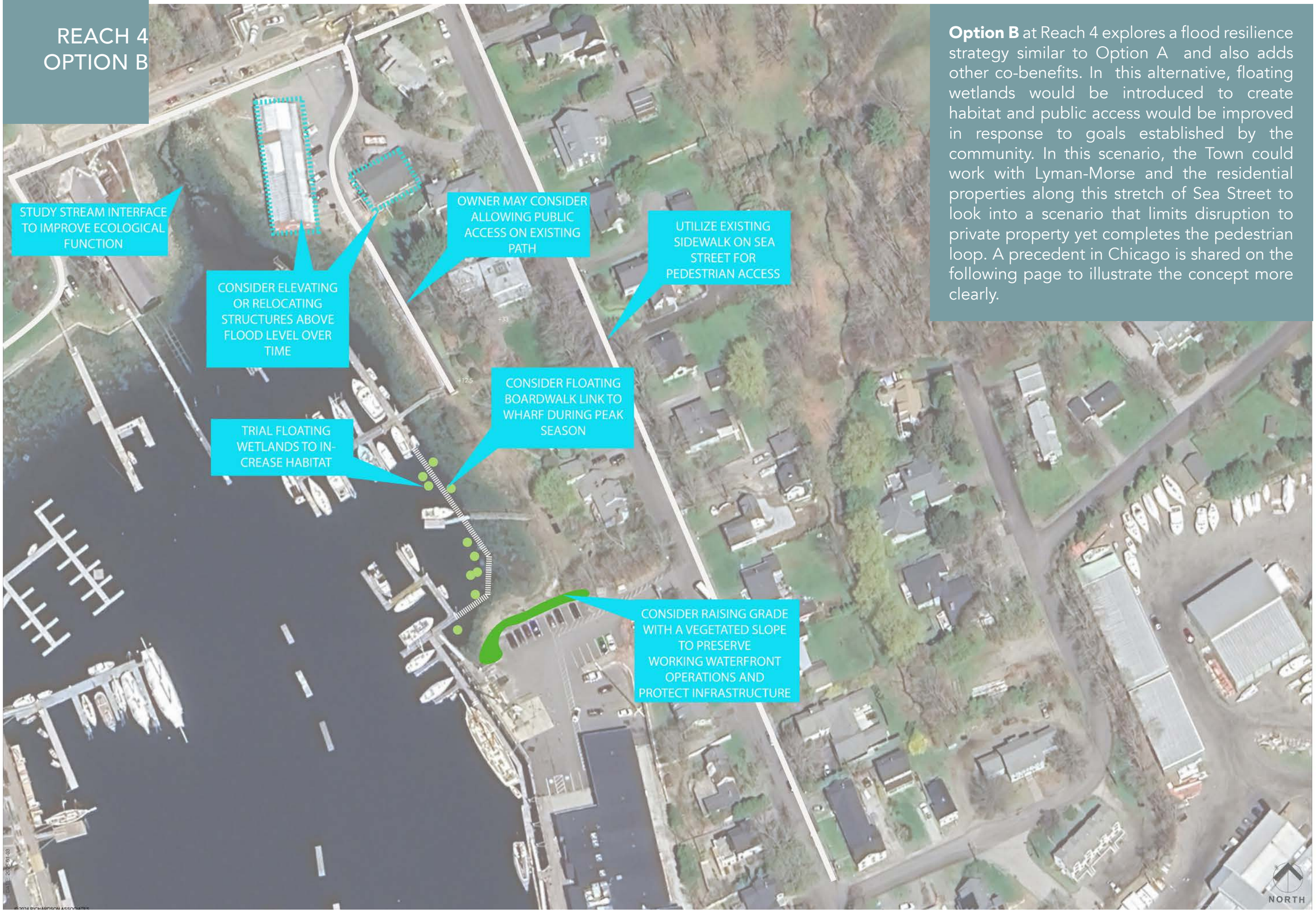
REACH 4
OPTION B



Option B at Reach 4 explores a flood resilience strategy similar to Option A and also adds other co-benefits. In this alternative, floating wetlands would be introduced to create habitat and public access would be improved in response to goals established by the community. In this scenario, the Town could work with Lyman-Morse and the residential properties along this stretch of Sea Street to look into a scenario that limits disruption to private property yet completes the pedestrian loop. A precedent in Chicago is shared on the following page to illustrate the concept more clearly.

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CAMDEN, ME

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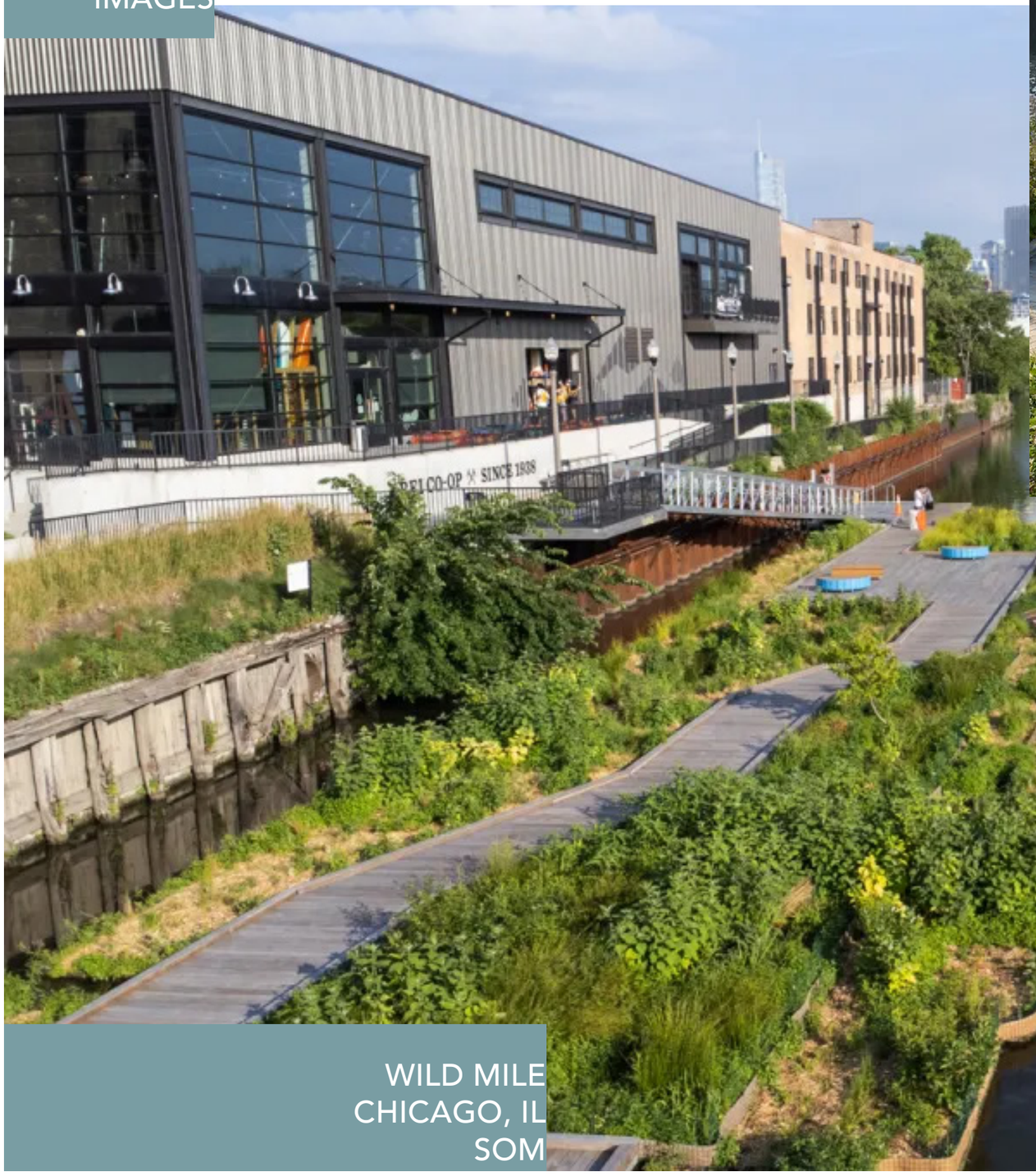
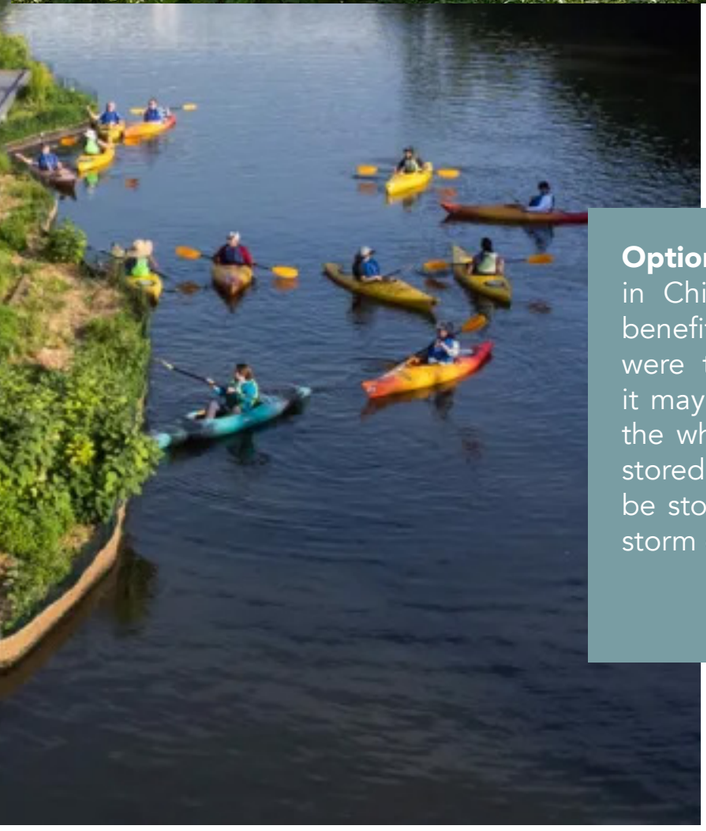
REACH 4 OPTION B CHARACTER IMAGES

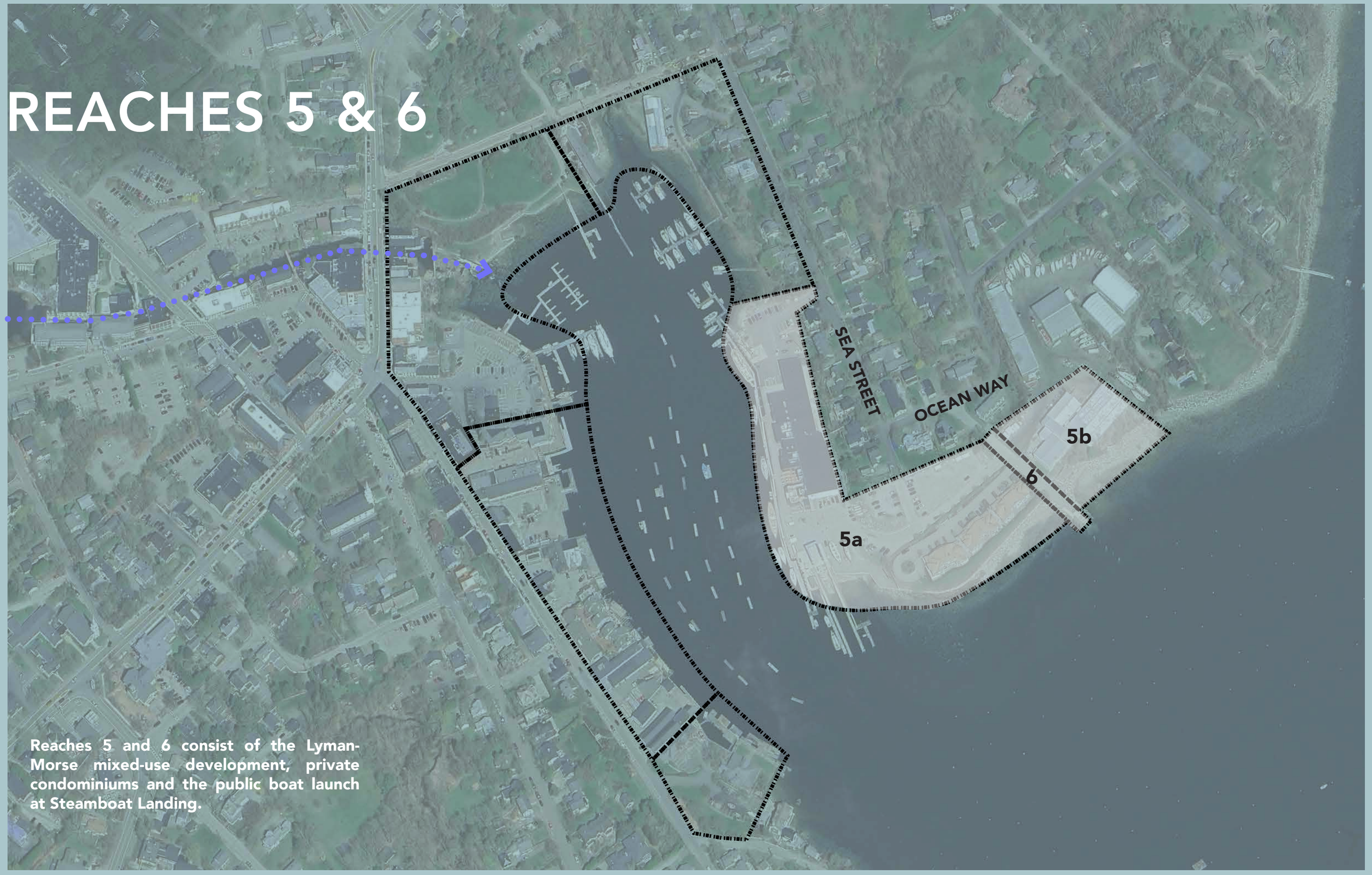




WILD MILE
CHICAGO, IL
SOM

Option B at Reach 4 is inspired by this project in Chicago that brings together ecological benefits and public access. If a similar approach were to be introduced in Camden Harbor, it may be possible to bridge the final link to the wharf at Lyman-Morse. Just as boats are stored on land for the winter, these rafts may be stored during the winter months to avoid storm damage.

REACHES 5 & 6



Reaches 5 and 6 consist of the Lyman-Morse mixed-use development, private condominiums and the public boat launch at Steamboat Landing.

REACH 5 EXISTING CONDITIONS

The lowest portions of Reach 5 are at risk of flooding during extreme storm events today. A flood resilience strategy could enable the working waterfront to utilize this property more fully.

REACH 5 EXISTING CONDITIONS

As one of the most recent developments along the inner harbor, the mixed-use development at Lyman-Morse showcases how the inner harbor may evolve as a blend of public access, successful commercial enterprise employment opportunities.

REACH 5 EXISTING CONDITIONS

The condominiums in this reach are located well above flood level for the forseeable future.

REACH 6 STEAMBOAT LANDING

FEMA funding has already enabled the town to invest in more storm resilient floats at Steamboat Landing. The old infrastructure shown here is soon to be replaced.

Through our outreach process we also heard the community express a desire for public bike racks proximate to the landing to enable folks to reduce reliance on private automobiles.

REACHES 5 & 6 FLOOD MAP

This flood map indicates the projected extent of inundation by incorporating both sea level rise and storm surge. The three colors correspond with three time horizons: 2030, 2050 and 2100.

The projected inundation lines are based on topography. In instances where the building ground-floor is raised off the ground, there may already be improved resilience.

KEY

- 2030
- 2050
- 2100

BASE FLOOD ELEVATION + PROJECTED SEA LEVEL RISE

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WHARF SITE PLAN

CAMDEN HARBOR MASTER PLAN
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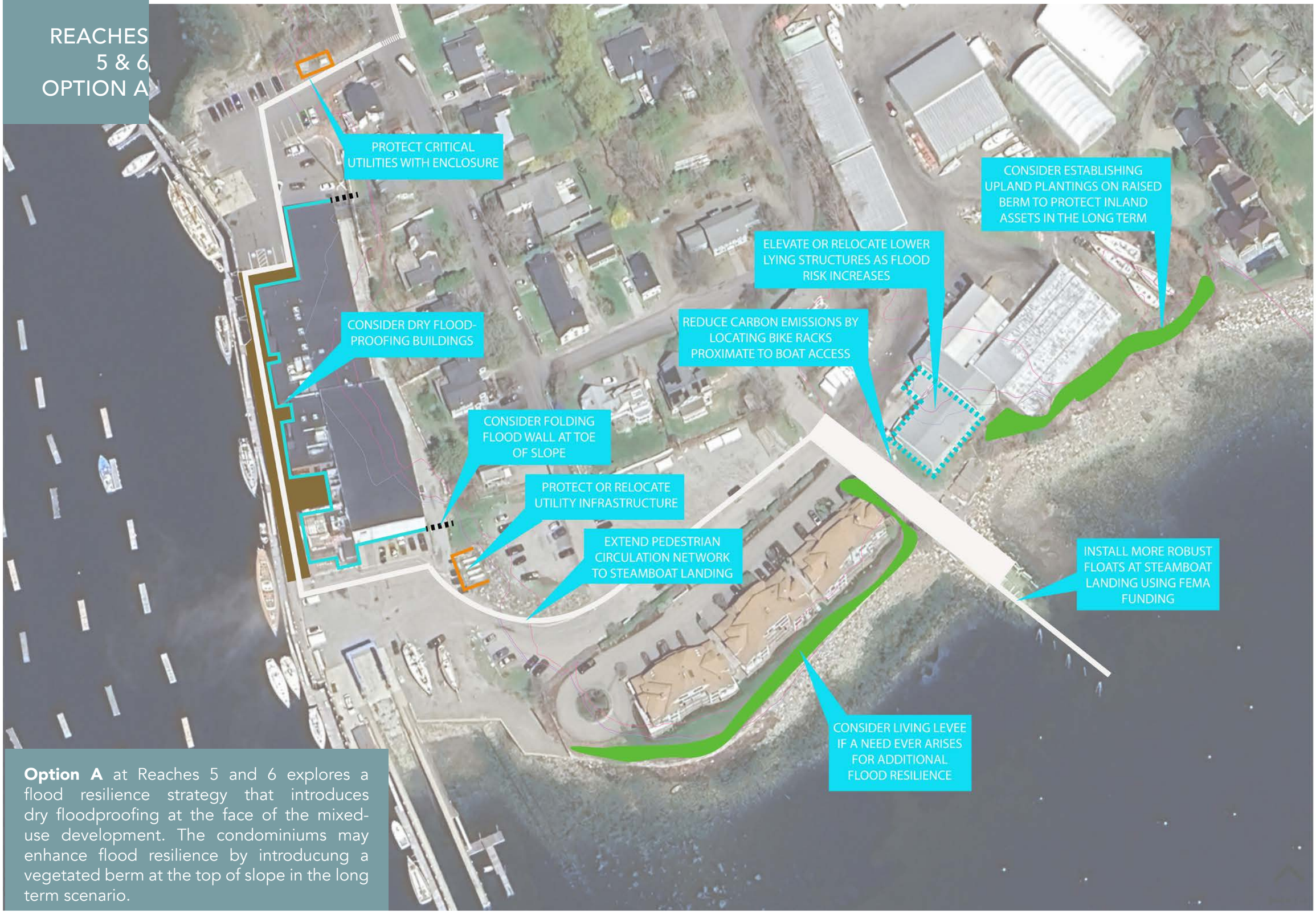
REACHES 5 & 6 OPTION A



Option A at Reaches 5 and 6 explores a flood resilience strategy that introduces dry floodproofing at the face of the mixed-use development. The condominiums may enhance flood resilience by introducung a vegetated berm at the top of slope in the long term scenario.

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WHARF SITE PLAN

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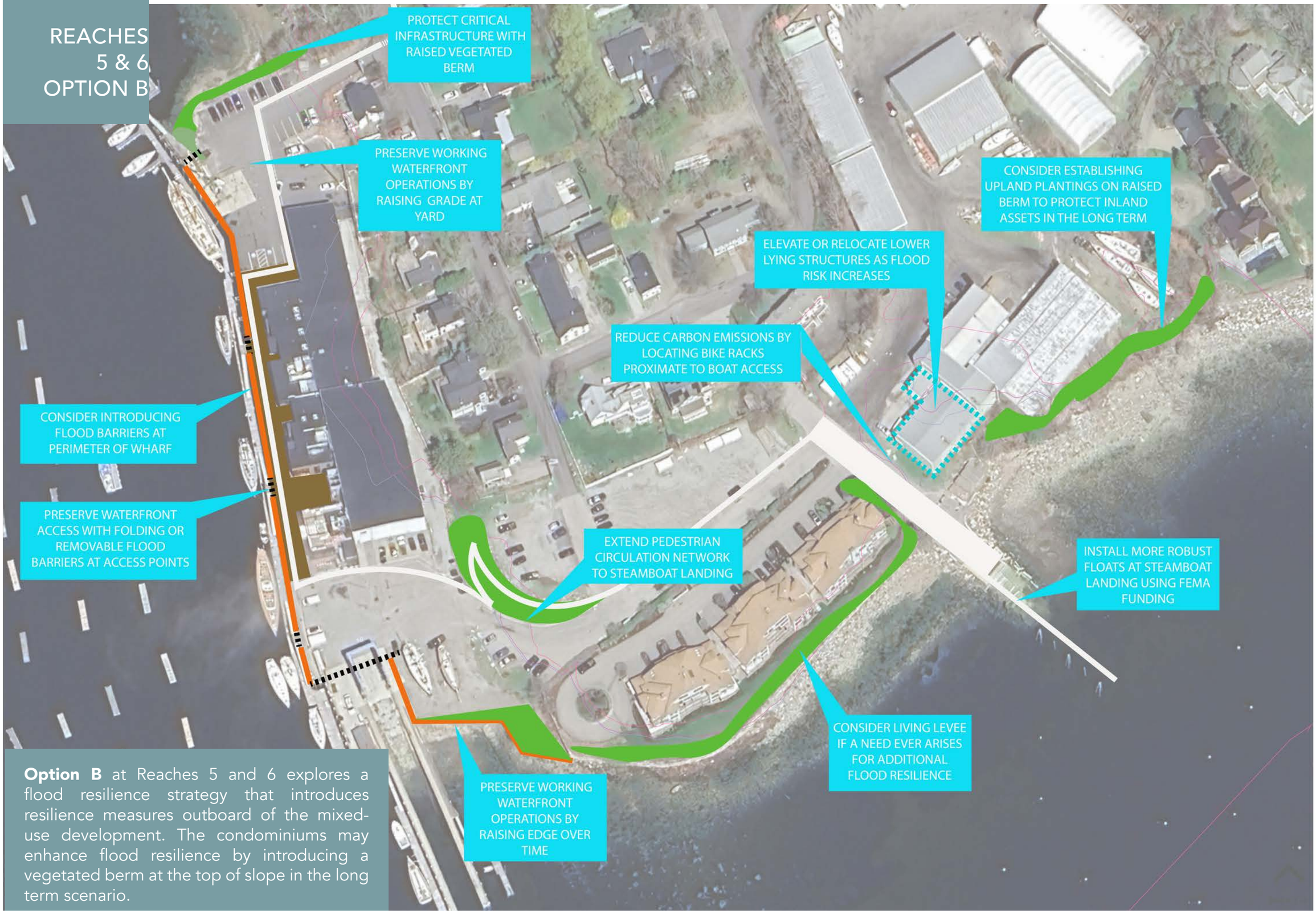
REACHES 5 &6 OPTION A DRY FLOOD-PROOFING

Option A at Reaches 5 and 6 explores a flood resilience strategy that introduces dry floodproofing measures at the face of the mixed-use development. This diagram represents how this strategy can be applied.

REACHES 5 & 6 OPTION B



Option B at Reaches 5 and 6 explores a flood resilience strategy that introduces resilience measures outboard of the mixed-use development. The condominiums may enhance flood resilience by introducing a vegetated berm at the top of slope in the long term scenario.

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WHARF SITE PLAN

CAMDEN HARBOR MASTER PLAN
CAMDEN, ME

L001

REACH 5 EXISTING CONDITIONS

REACH 5 OPTION B RESILIENCE STRATEGIES

Option B at Reaches 5 introduces elements at the perimeter of the site to create flood barriers while providing co-benefits. In this example, most of the perimeter is sheltered with a raised edge created by a counter. Removable flood gates are envisioned at the threshold to the gangways to preserve boat access. This would be sealed ahead of pending storms but open ordinarily.

REACH 5 OPTION B RESILIENCE STRATEGIES

Option B at Reaches 5 introduces elements at the perimeter of the site to create flood barriers while providing co-benefits. In this example, flood resilience is provided by a series of different raised elements between the mixed-use and the water's edge. They could match the architectural character of the development.

REACH 5 OPTION B RESILIENCE STRATEGIES

REACH 5 OPTION B RESILIENCE STRATEGIES

Option B at Reaches 5 introduces elements at the perimeter of the site to create flood barriers while providing co-benefits. In this example, kinetic flood walls are envisioned as a canopy that provides shade to the wharf.

REACH 5 OPTION B RESILIENCE STRATEGIES

Option B In this example, the canopy can fold down to provide a flood barrier to preserve operations of the mixed-use development even in the long term sea level rise scenarios. There are systems available that fold up from the ground rather than folding down if desired.

FLOOD RESILIENCE SUMMARY

At the final community engagement event we invited comments and questions on the draft resilience options. We also asked folks to weigh in on their preferred alternative or combination of alternatives. The majority of responses received prefer resilience scenario B. The key themes of both alternatives are summarized on the following pages.

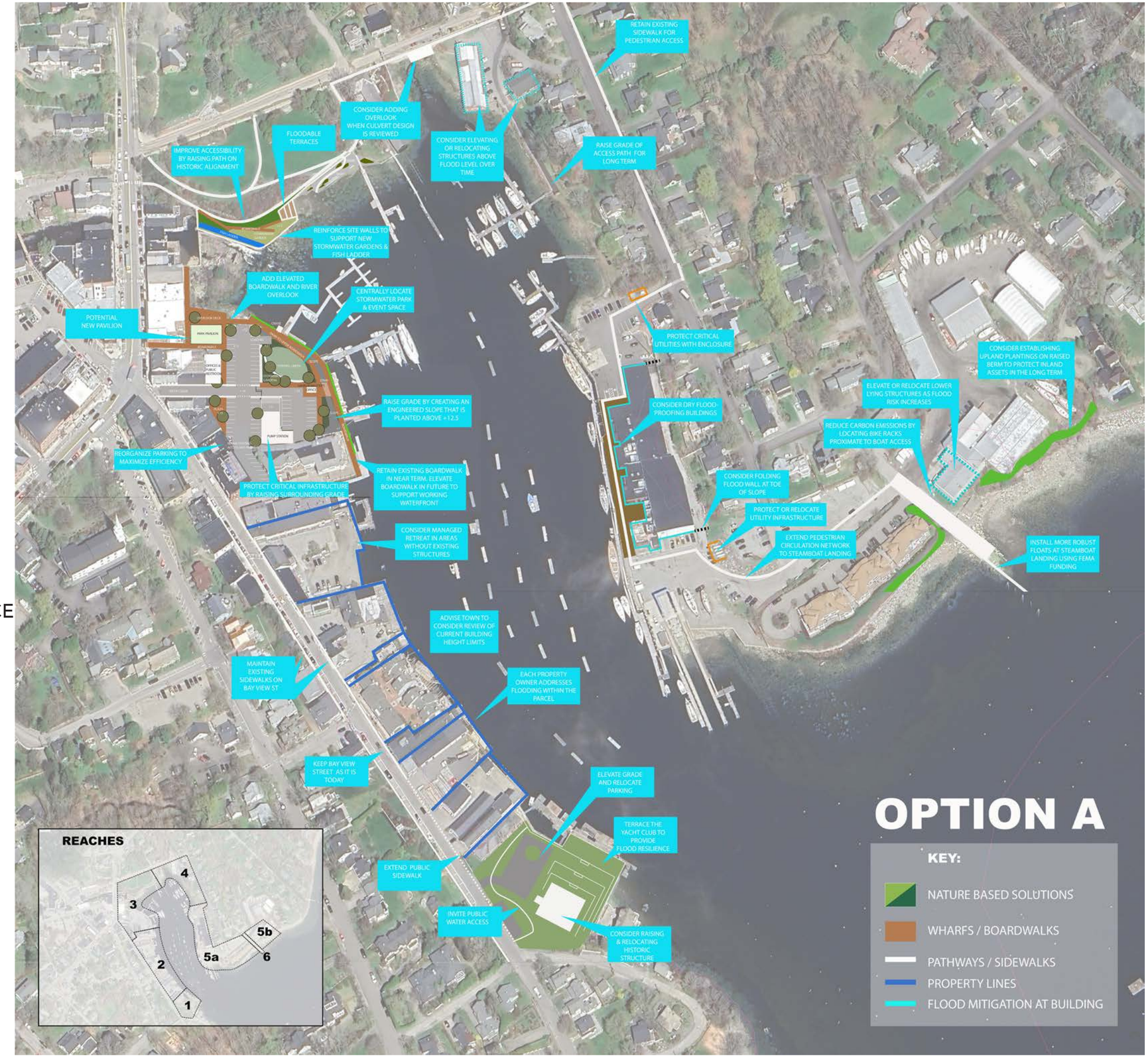
While these strategies are high level visions, the hope is that near-term priorities areas are refined as needed in detailed design to allow for implementation.

For more detail on suggested sequencing of near term, mid-term and long term resilience projects please refer to the resilience road map included in this report.

OPTION A SUMMARY

KEY THEMES:

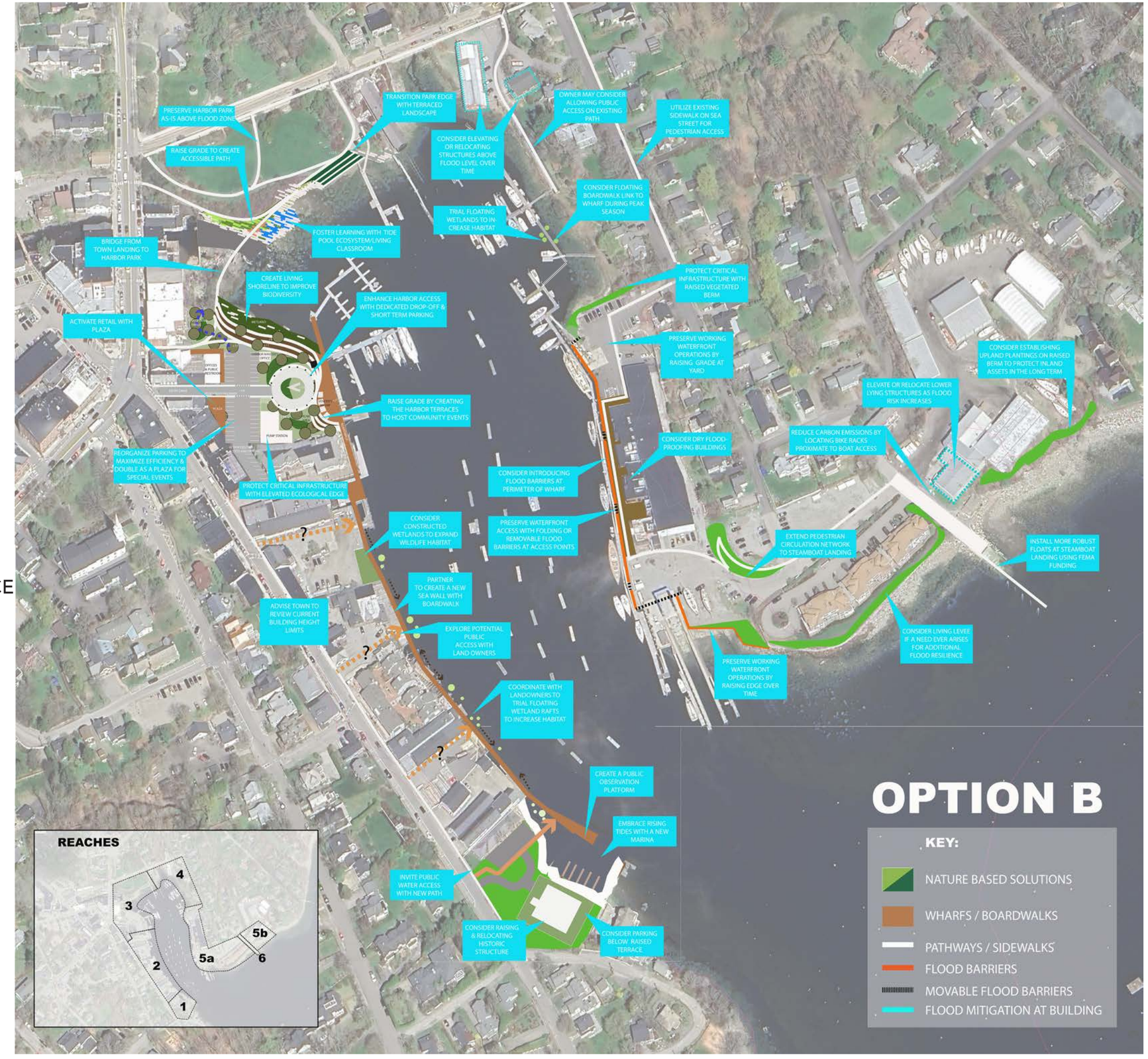
- FLOOD RESILIENCE STRATEGIES ARE INDIVIDUALISTIC AND DESIGNED TO WORK WITHIN EACH LOT
- NO COMMUNAL WATERFRONT PEDESTRIAN LOOP
- NO PEDESTRIAN BRIDGE BETWEEN HARBOR PARK AND TOWN LANDING
- LESS OPPORTUNITY FOR HABITAT CREATION
- MORE PARKING / LESS PARKLAND
- ELEVATES AND RELOCATES HISTORIC YACHT CLUB
- CRITICAL INFRASTRUCTURE IS PROTECTED IN PLACE



OPTION B SUMMARY

KEY THEMES:

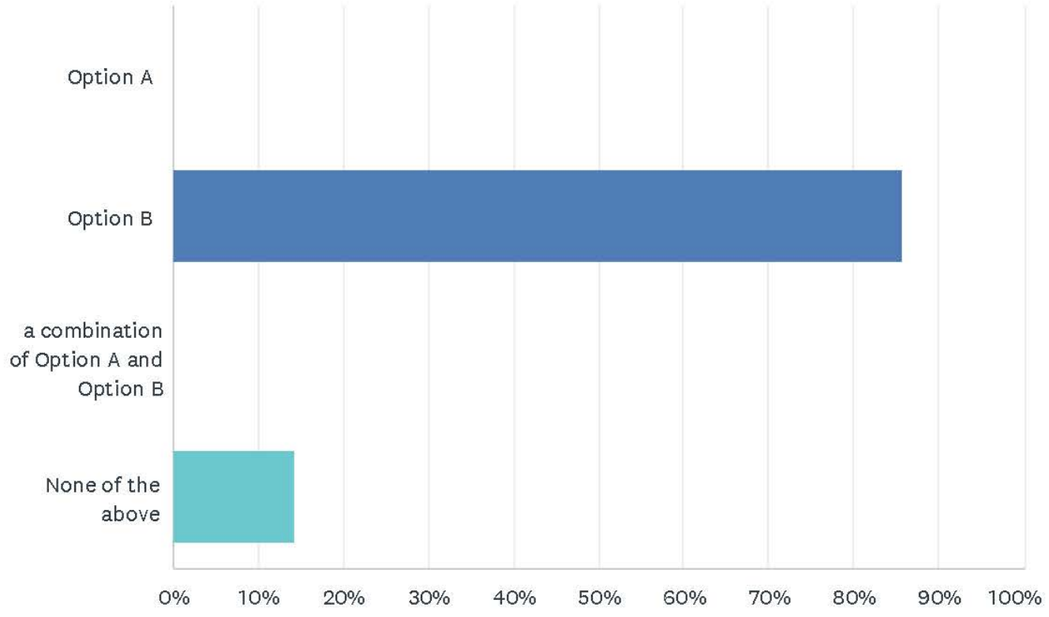
- FLOOD RESILIENCE STRATEGIES EXPLORE PARTNERSHIPS TO REDUCE COST AND PROVIDE MORE BENEFITS
- COMMUNAL WATERFRONT PEDESTRIAN LOOP
- INCLUDES PEDESTRIAN BRIDGE BETWEEN HARBOR PARK AND TOWN LANDING
- PRIORITIZES NATURE BASED SOLUTIONS
- ELEVATES AND RELOCATES HISTORIC YACHT CLUB AND ADDS BOAT SLIPS
- CRITICAL INFRASTRUCTURE IS PROTECTED IN PLACE



SECOND PUBLIC SURVEY_RESULTS

Q2 Of the two preliminary options presented today, was there one approach that aligns more closely with your aspirations for a resilient harbor or would you combine aspects from each?

Answered: 7 Skipped: 0



ANSWER CHOICES	RESPONSES	
Option A	0.00%	0
Option B	85.71%	6
a combination of Option A and Option B	0.00%	0
None of the above	14.29%	1
TOTAL		7

Q3 If you prefer a combination, please identify which approach you prefer for each segment or “reach” within the project area

Answered: 1 Skipped: 6

ANSWER CHOICES	RESPONSES	
Reach 1: Yacht Club Option A	0.00%	0
Reach 1: Yacht Club Option B	100.00%	1
Reach 2: Bay View Street Properties Option A	0.00%	0
Reach 2: Bay View Street Properties Option B	100.00%	1
Reach 3: Town Landing and Harbor Park Option A	100.00%	1
Reach 3: Town Landing and Harbor Park Option B	100.00%	1
Reach 4: Sea Street Option A	0.00%	0
Reach 4: Sea Street Option B	0.00%	0
Reach 5: Lyman-Morse and Ocean Way Option A	0.00%	0
Reach 5: Lyman-Morse and Ocean Way Option B	0.00%	0
Reach 6: Steamboat Landing Option A	0.00%	0
Reach 6: Steamboat Landing Option B	0.00%	0

#	REACH 1: YACHT CLUB OPTION A	DATE
	There are no responses.	

#	REACH 1: YACHT CLUB OPTION B	DATE
1	less expensive	2/10/2025 12:15 PM

#	REACH 2: BAY VIEW STREET PROPERTIES OPTION A	DATE
	There are no responses.	

#	REACH 2: BAY VIEW STREET PROPERTIES OPTION B	DATE

Q4 Is there anything else you wish to share related to flood resilience at Camden's inner harbor?

Answered: 6 Skipped: 1

#	RESPONSES	DATE
1	Great presentation. Thank you! I love the option B connections and co benefits. That is a future harbor that would really enhance and protect the inner harbor. I am less sanguine about private property owners agreeing to these plans but I hope I am wrong.	2/21/2025 1:15 PM
2	-Great B Plan for Town Landing + Harbor Park -Can we see how Reach 6B would look w/FEMA redevelopment? -Excellent to have pedestrian access + linkages -Good job diffusing measures with the breakwater. Best to apply those resources to then B options you outlined Thanks for all the creative vision that went into this	2/21/2025 1:12 PM
3	Reach 3 - Where is fisherman dock located along with associated boom life and vehicle access? Bulkhead? "Retreat" is not a consideration What ecological consequences of the approaches/options Property owners need to define their ability and interest in participating in any plan use dredge as fill - interesting idea underlying premise - armor against geologic process	2/21/2025 12:53 PM
4	I like the idea of a local volunteer gardeners' nursery to grow the plantings for the town landing etc. I think there are enough enthusiastic and experienced gardeners around to do this, including myself. Fish access to the river is a priority for me. I have always wished for a walkway between harbor park and the town landing and would love to see this take place. A walkway round the entire harbor with floating boardwalk as you described would be even better. Incorporating all of this in conjunction with working waterfront needs, or even improved working waterfront for those who work it, would be a wonderful achievement.	2/10/2025 1:57 PM
5	there is not going to be a fish ladder. there should be a bridge between harbor park and the public landing	2/10/2025 12:15 PM
6	I was really glad you took the time to talk about breakwaters and wave attenuation systems. Loved the way your team all brought material to the event. And really appreciated all the creativity in the ideas. Your work shows how well you listened to the various different stakeholders. Many thanks.	2/6/2025 12:30 PM

RESILIENCE ROAD MAP

Resilience Road Map

*Proposed conceptual timeline identifies how projects may unfold over time by identifying near term, mid term and long term measures. This is not a requirement.
The road map is simply a reference tool that reflects the typical project workflow based on the consultant's experience to date.

		Today	2030	2050	2100	Beyond 2100
Reach 1: Camden Yacht Club						
	Near-term flood risk = Recommend raising and relocate Camden Yacht Club to protect historic structure					
1.1	Town and Yacht Club leadership to review resilience recommendations and align on process to advance flood resilience measures to protect the historic building					
1.2	Seek out funding sources for detailed design and implementation of resilience measures from both the public and private sectors using this planning work as a catalyst for investment					
1.3	Enlist qualified consultant to create detailed site design and construction documents for bidding and construction					
1.4	Enlist structural engineer and historic architect to assess structural integrity of building and make necessary repairs/reinforcements to prepare structure to be relocated and weather current flood risk					
1.5	Secure all required permits					
1.6	Regrade site topography using fill to elevate grade to allow structure to be relocated out of flood zone.					
1.7	Raise and relocate historic structure out of flood zone					
1.8	Reconfigure parking, access drive, infrastructure, pedestrian paths and landscape to correspond with relocated building					
	Anticipated length of flood mitigation for resilience measures designed to address 2100 projections. *Note that projections are estimates and not guaranteed					
	Additional adaptation measures may be necessary if and when projected 2100 flood levels are achieved *Note that projections are estimates and not guaranteed					? ? ? ?
Reach 2: Bayview Street Properties						
	Near-term flood risk = Recommend property owners consider flood resilience, retreat or relocation					
2.1	Town to review existing building height limits and consider amendment to code to increase height limits to allow waterfront buildings to be elevated over time					
2.2	Property owners with waterfront property on Bay View Street to consider preliminary recommendations from this planning study					
2.3	If alternative A is preferred, owners would take on independent resilience measures within their property in compliance with applicable laws					
2.4	If alternative B is preferred, property owners would voluntarily coordinate on a unified resilience strategy to shelter their properties from flood risk. *If public benefits are incorporated such as public access, there may be additional funding streams available to support improvements					
2.5	Develop detailed design and engineering drawings. Model potential impacts to surrounding properties.					
2.6	Begin permitting process and regulatory review					
2.7	Apply for grant funding to support resilience measures that preserve operations around the working waterfront, protect historic structures and/or incorporate public benefits					
2.8	Owners may elect to implement flood resilience measures once all regulatory approvals are in place					
	Anticipated length of flood mitigation for resilience measures designed to address 2100 projections. *Note that projections are estimates and not guaranteed					
	Additional adaptation measures may be necessary if and when projected 2100 flood levels are achieved *Note that projections are estimates and not guaranteed					? ? ? ?
Reach 3: Town Landing and Harbor Park						
	Near-term flood risk = Recommend Town and Library consider actions to address flooding of critical infrastructure and historic parklands					
3.1	Town and Library leadership to review resilience recommendations and identify processes/budgets to advance flood resilience measures					
3.2	Library to submit grant application to FEMA for Harbor Park phase 1 resilience measures					
3.3	Public to vote on Mention River and Montgomery Dam project					
3.4	Seek out funding sources for detailed design and implementation of resilience measures from both the public and private sectors using this planning work as a catalyst for investment					
3.5	Town to enlist qualified consultant to create detailed site design and construction documents for bidding and construction at the Town Landing					
3.6	Library to enlist qualified consultant to create detailed site design and construction documents for bidding and construction at the Town Landing					
3.7	Secure all required permits					
3.8	Construct flood resilience measures at Town Landing that support the working waterfront, ecology, enhanced public access and tourism					
3.9	Construct Harbor Park tidepool ecosystem and outdoor learning lab and address shoreland flood risk to protect Harbor Park					
	Anticipated length of flood mitigation for resilience measures designed to address 2100 projections. *Note that projections are estimates and not guaranteed					
	Additional adaptation measures may be necessary if and when projected 2100 flood levels are achieved *Note that projections are estimates and not guaranteed					? ? ? ?
Reach 4: American Boat House and Sea Street Properties						
	Minimal flood risk in near-term. Suggest routine monitoring and gradual improvements for long term resilience.					
4.1	Existing structures within anticipated 2030 flood zone to be assessed on a case by case basis					
4.2	Consider raising, relocating or dry floodproofing existing structures at risk of flooding by 2030					
4.2	*Monitor flooding and raise grade of access path to docks on as-needed basis*					
4.3	*Existing structures within anticipated 2100 flood zone to be assessed on a case by case basis*					
	Anticipated length of flood mitigation for resilience measures designed to address 2100 projections. *Note that projections are estimates and not guaranteed					
	Additional adaptation measures may be necessary if and when projected 2100 flood levels are achieved *Note that projections are estimates and not guaranteed					? ? ? ?
Reach 5a and 5b: Lyman-Morse Mixed-Use Development and Private Condominiums						
	Deliverables					
5.1	Town to review existing building height limits and consider amendment to code to increase height limits to allow waterfront buildings to be elevated over time					
5.2	Property owners to consider preliminary recommendations from this planning study					
5.3	If alternative A is preferred, flood risk would be managed through dry floodproofing buildings within the flood zone.					
5.4	If alternative B is preferred, the working waterfront would be sheltered by strategies outboard of flood prone buildings to provide flood resilience					
5.5	Develop detailed design and engineering drawings. Model potential impacts to surrounding properties.					
5.6	Begin permitting process and regulatory review					
5.7	Apply for grant funding to support resilience measures that preserve operations around the working waterfront, protect historic structures and/or incorporate public benefits					
5.8	Owners may elect to implement flood resilience measures once all regulatory approvals are in place					
5.9	Condominiums owners to monitor change over time and assess risk. Nature based strategies at the top of slope planted now may be well established by the time flood risk is a consideration.					
	Anticipated length of flood mitigation for resilience measures designed to address 2100 projections. *Note that projections are estimates and not guaranteed					
	Additional adaptation measures may be necessary if and when projected 2100 flood levels are achieved *Note that projections are estimates and not guaranteed					? ? ? ?
Reach 6: Steamboat Landing						
	Flood risk mitigation measures already underway in partnership with FEMA					
6.1	Town to install improved floats at public boat launch					
6.2	Town to consider additional upgrades over time such as bike racks to reduce reliance on private automobiles					

KEY	
	Proposed Actions for Public Property
	Proposed Considerations for Private Property Owners
	Projected Resilience *Estimates are not guaranteed

POTENTIAL FUNDING SOURCES

Funding for resilience measures on the public parcels may come in part from the Town but additional funds will certainly be needed to achieve the most robust results.

The following pages include State and Federal funding sources organized by the Southern Maine Planning and Development Commission that the Town may consider. Please note that these are subject to change.

In addition, the Camden community may consider private philanthropic contributions toward resilience measures. This is more likely the case for measures that couple flood resilience measures with co-benefits such as public access, ecology, education and improved water quality.

DRAFT

Climate Ready Coast – Southern Maine

Funding Opportunities for Coastal Resilience: **Federal**

Program Name	Agency/Dept.	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
National Coastal Resilience Fund	NOAA, NFWF	Supporting nature-based solutions that enhance the resilience of coastal communities and habitats to address increasing threats from storms, sea level rise, and other coastal hazards	▪ Non-profits ▪ State/territorial government agencies ▪ Local & municipal governments ▪ Tribal governments & orgs ▪ Academic institutions ▪ For-profit orgs	$140M total funding available. No min. or max. award amount. Non-federal match encouraged (cash and/or in-kind)	Annual program. Next RFP TBA	Categories: 1) Community capacity building and planning, 2) Site assessment and preliminary design, 3) Final design and permitting, 4) Restoration implementation. Possible projects: beach/dune restoration, marsh/wetland restoration	✓	✓	✓	✓	✓	✓	✓	✓
The Effects of Sea Level Rise Program (ESLR)	NOAA	Supporting the development of actionable information and tools that improve protection, management, and conservation of ocean and coastal ecosystems	▪ Non-profits ▪ State & local governments ▪ Tribal governments ▪ U.S. Territories ▪ U.S. Affiliated Pacific Islands institutions ▪ Academic institutions ▪ For-profit orgs	Individual awards $200,000 - $500,000	Application deadline Jan 24, 2024	Regional-scale, targeted research addressing issues including harmful algal blooms, coastal resilience, sea-level rise, ocean acidification, mesophotic coral ecosystems, effective ecosystem-based management		✓		✓	✓	✓		
Coastal Habitat Restoration and Resilience Grants for Underserved Communities	NOAA	Advancing coastal habitat restoration and climate resilience priorities of tribes and underserved communities	▪ State, local, & Tribal governments that can demonstrate status as/partner with an underserved community ▪ Non-profits ▪ U.S. Territories ▪ Academic institutions ▪ For-profit orgs	$45M total funding available. Individual awards $75,000 - $1M	Proposals due December 19, 2023	Capacity-building activities: resilience planning, project planning and feasibility studies, proposal development. Restoration activities: demonstration projects, engineering and design, permitting, implementation		✓		✓	✓	✓	✓	✓
Emergency Coastal Resilience Fund (ECRF)	NOAA, NFWF	Supporting nature-based projects in impacted areas to reduce climate change impacts on coastal communities, and to enhance coastal ecosystems	▪ Non-profits ▪ State & local governments ▪ Tribal governments ▪ U.S. Territories ▪ Academic institutions ▪ For-profit orgs	$24M total funding available. No min. or max. expected award amount	TBD	Types of projects: 1) restoration and monitoring, 2) site assessment and design. E.g. design/implement-ation of wetland habitat restoration, living shoreline construction	✓	✓						✓
Restoring Fish Passage through Barrier Removal Grants	NOAA	Supporting projects that reopen migratory pathways and restore access to healthy habitat for fish around the country.	▪ Non-profits ▪ State & local governments ▪ Tribal governments ▪ U.S. Territories ▪ Academic institutions ▪ For-profit orgs	$175M total funding available. Individual awards $1M - $20M	Proposals due October 16, 2023	Locally-led removals of dams and other in-stream barriers		✓		✓				✓

DRAFT

Program Name	Agency/Dept.	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
National Coastal Resilience Fund	NOAA, NFWF	Supporting nature-based solutions that enhance the resilience of coastal communities and habitats to address increasing threats from storms, sea level rise, and other coastal hazards	▪ Non-profits ▪ State & local governments ▪ Tribal governments & orgs ▪ U.S. Territories ▪ Academic institutions ▪ For-profit orgs	$140M total funding available. No min. or max. expected award amount. Non-federal match encouraged (cash and/or in-kind)	Annual program. Next RFP TBD	Categories: 1) Community capacity building and planning, 2) Site assessment and preliminary design, 3) Final design and permitting, 4) Restoration implementation. Possible projects: beach/dune restoration, marsh/wetland restoration		✓			✓	✓	✓	✓
Ocean-Based Climate Resilience Accelerators	NOAA	Funding accelerator for supporting businesses navigating commercialization pathways for ocean-based climate resilience solutions that help communities prepare for, adapt to, and build resilience to climate challenges	▪ Non-profits ▪ State, county, city, township, & special district governments ▪ Tribal governments & orgs ▪ Academic institutions ▪ Small businesses	$5M total funding available. Individual awards $50,000 - $250,000	TBD	Projects should align with the U.S. Ocean Climate Action Plan, such as: maintain and expand ocean basic and applied research, develop innovative technologies and information pathways for ocean climate action, enhance community resilience to ocean					✓	✓		✓
Transformational Habitat Restoration and Coastal Resilience Grants	NOAA	Supporting habitat restoration projects that restore marine, estuarine, coastal, or Great Lakes ecosystems, using approaches that enhance community and ecosystem resilience to climate hazards	▪ Non-profits ▪ State & local governments ▪ Tribal governments ▪ U.S. Territories ▪ Academic institutions ▪ For-profit orgs	$240M total funding available. Individual awards $1M - $25M	Proposals must be received through Grants.gov by 11:59 PM Eastern time on November 17, 2023	Habitat restoration actions must: rebuild productive and sustainable fisheries, contribute to the conservation of threatened and endangered species, promote climate-resilient ecosystems, improve economic vitality		✓						✓
Five Star Wetland and Urban Waters Restoration Grant	EPA, NFWF	Developing nation-wide community stewardship of local natural resources, preserving these resources for future generations and enhancing habitat for local wildlife	▪ Non-profits ▪ State & local governments ▪ Tribal governments ▪ U.S. Territories ▪ Academic institutions	$1.6M total funding available. Individual awards $20,000 - $50,000. Non-federal 1:1 match required (cash and/or in-kind)	Annual. 2024 Request for Proposals (RFP) expected to be announced soon	Address water quality issues in priority watersheds, such as erosion due to unstable streambanks, pollution from stormwater runoff, and degraded shorelines caused by development	✓	✓						✓

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Program Name	Agency/Dept.	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
Water Infrastructure Finance and Innovation Act (WIFIA)	EPA	Fast-tracking water, wastewater, and stormwater infrastructure funding by providing long-term, low-cost, supplemental credit assistance in the form of direct loans or loan guarantees	▪ Federal, State, & local governments ▪ Tribal governments ▪ Includes partnerships/joint ventures, corporations & trusts, Clean Water/Drinking Water State Revolving Fund programs	$6.5B total funding available. Individual award min. $5M for small communities, $20M for large communities	Currently accepting letters of interest	Wastewater projects; drinking water treatment and distribution projects; energy efficiency projects at drinking water and wastewater facilities; desalination, aquifer recharge, and water recycling projects; property acquisition if it is integral to the project	✓				✓	✓	✓	✓
Wetland Program Development Grants (WPDGs)	EPA	Building the capacity of state/tribal/local governments to increase the quantity and quality of wetlands in the U.S. by conserving and restoring wetland acreage and improving wetland condition	▪ State & local governments ▪ Tribal governments ▪ Interstate/inter tribal entities	$660,000 total funding available. Individual awards $75,000 - $220,000. 25% match required (cash and/or in-kind)	Requests for Proposals (RFPs) are typically put out in the spring time	Projects must promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys and studies relating to the causes, effects, extent, prevention, reduction and elimination of water pollution		✓			✓	✓		
America the Beautiful Challenge	NFWF	Consolidating funding from multiple federal agencies and the private sector to enable applicants to conceive and develop large-scale projects that address shared funder priorities and span public and private lands	▪ State governments ▪ Tribal governments ▪ U.S. Territories ▪ Local groups ▪ Non-governmental organizations	$116M total funding available. Individual awards $200,000 - $5M. Up to 50% match required depending on project category	2024 RFP TBA	Projects should focus on at least one of the following: Conserving and restoring rivers, coasts, wetlands, and watersheds; Conserving and restoring forests, grasslands, and other important ecosystems that serve as carbon sinks; Connecting and reconnecting wildlife corridors, large landscapes, watersheds, and seascapes; Improving ecosystem and community resilience to coastal flooding, drought, and other climate-related threats; Expanding access to the outdoors, particularly in underserved communities		✓			✓	✓	✓	✓

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Program Name	Agency/Dept.	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
Building Resilient Infrastructure and Communities (BRIC)	FEMA	Funding hazard mitigation projects, reducing the risks communities face from disasters and natural hazards	▪ State & local governments ▪ Tribal governments ▪ U.S. Territories	$2.295B total funding available. 25% non-federal cost share required. Economically Disadvantaged Rural Communities (EDRCs) eligible for up to 10% non-federal cost share	Next application period expected to open Fall 2023	Address future risks to natural disasters, including wildfires, drought, hurricanes, earthquakes, extreme heat, and flooding. Funds may be used for capability- and capacity-building activities, mitigation projects, and management costs	✓			✓	✓			✓
Flood Mitigation Assistance Grant Program	FEMA	Reducing or eliminating the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program	▪ State & local governments ▪ Tribal governments ▪ U.S. Territories	$642.5M total funding available. 25% non-federal cost share required	Next application period expected to open Fall 2023	Categories: project scoping, technical assistance, flood mitigation, management costs, and more. Project types include acquisition, re-location, elevation, reconstruction, dry-proofing, restoration of floodplains, soil	✓	✓	✓		✓	✓	✓	✓
National Culvert Removal, Replacement & Restoration Grants (Culvert Aquatic Organism Passage (AOP) Program)	DOT, Federal Highway Administration (FHA)	Funding projects that replace, remove, and repair culverts or weirs that meaningfully improve or restore fish passage for anadromous fish	▪ State & local governments ▪ Tribal governments	$196M total funding available. Individual awards $10,000 - $20M. Cost share required	Annual. NOFO expected in October with February application deadline	Replace, remove, or repair culverts or weirs that would meaningfully improve or restore fish passage for anadromous fish, With respect to weirs, projects may include infrastructure to facilitate fish passage around or over the weir, and weir improvements	✓	✓						✓
Water & Waste Disposal Loan & Grant Program	Dept. of Agriculture	Funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas	▪ Non-profits ▪ State & local governments ▪ Tribal governments	Funding available in the form of long-term, low-interest loans. If funds are available, a grant may be combined with a loan if necessary to keep user costs reasonable	Applications are accepted year round and may be filed electronically using RD Apply	Acquisition, construction or improvement of: Drinking water sourcing, treatment, storage, and distribution; Sewer collection, transmission, treatment, and disposal; Solid waste collection; Storm water collection, transmission, and disposal and closure	✓		✓					✓

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Program Name	Agency/Dept.	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
Continuing Authorities Program Section 205 -- Small Flood Risk Management Projects	U.S. Army Corps of Engineers	Funding planning and and construction of small flood damage reduction or flood risk management projects	USACE non-federal sponsors, which includes: ▪ Legally constituted public entities ▪ Non-profits	$10M max. federal expenditure per project	Contact District Engineer to request a study	Projects may be structural (e.g., levees, flood walls, diversion channels, pumping plants and bridge modifications) or non-structural (e.g., floodproofing, relocation of structures and flood warning systems)	✓				✓	✓	✓	✓
Continuing Authorities Program Section 206 -- Aquatic Ecosystem Restoration	U.S. Army Corps of Engineers	Developing aquatic ecosystem restoration and protection projects that improve the quality of the environment	USACE non-federal sponsors, which includes: ▪ Legally constituted public entities ▪ Non-profits	$10M max. federal expenditure per project	Contact District Engineer to request a study	Restore degraded aquatic ecosystems, e.g. estuary restoration, removal of in-stream barriers not associated with hydropower		✓			✓	✓	✓	✓

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Funding Opportunities for Coastal Resilience: **State**

Program Name	Dept./ Agency	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
Small Harbor Improvement Program	Maine DOT	Promoting economic development, public access, improved commercial fishing opportunities and work to preserve and create infrastructure at facilities in tidewater and coastal municipalities	Tidewater communities that can demonstrate a need to improve economic activity and access to a tidewater river or the ocean on publicly accessible property	The SHIP program can provide up to $250,000 towards eligible projects. 50% local share required	Ongoing application process	Must improve public access to water, including commercial and recreational fishermen and other resource- and tourism-related industries. E.g. wharf improvements, hoist systems, boat ramps, gangways, stairwells to clam flats	✓							✓
Shore and Harbor Planning Grants	Maine Dept of Marine Resources	Funding planning efforts for activities or infrastructure at public waterfronts	▪ Municipalities ▪ Unorganized townships ▪ Regional planning orgs ▪ Tribal governments	Maximum award $50,000. 25% non-federal match required (cash and/or in-kind)	Funding opens yearly in February	Funds can be used to plan for shore access, improve harbor management, or plan for the impact of future conditions (e.g. sea level rise, storm surge, flooding) on public waterfront infrastructure	✓			✓	✓			
Coastal Community Grant Program	Maine Dept of Marine Resources	Funding local and regional projects that build community resiliency to adapt to a changing climate; prepare for flooding, sea level rise, coastal storms and storm surge, and shoreline erosion; and address land use activity impacts to water quality	▪ Counties ▪ Municipalities ▪ Unorganized territories ▪ Tribal governments ▪ Regional planning orgs	$165,000 total funding available. Individual awards $20,000-$50,000. 25% non-federal match required (cash and/or in-kind)	Annual program. Next round TBA	Planning and development of feasibility and vulnerability studies, planning and development of regulatory and non-regulatory policies and programs, capital improvements planning, climate change outreach and education, public processes throughout the project, development of funding strategies				✓	✓			
Community Resilience Partnership Community Action Grants	Maine GOPIF	Supporting projects that reduce energy use and costs and/or make communities more resilient to climate change effects, such as flooding, extreme weather, drought, and public health impacts	▪ Municipal governments ▪ Tribal governments ▪ Unorganized territories ▪ Must be a member of the Community Resilience Partnership	Request amount $5,000-$50,000; up to $125,000 for combined proposals. Certain grants require local match	Communities are eligible to apply once enrolled in the CRP	Actions can fall under: 1) actions from the List of Community Actions aligning with Maine Won't Wait, 2) other projects proposed by a community that support capacity building, planning, and implementation projects	✓	✓	✓	✓				✓

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Program Name	Agency/Dept.	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
Continuing Authorities Program Section 205 -- Small Flood Risk Management Projects	U.S. Army Corps of Engineers	Funding planning and and construction of small flood damage reduction or flood risk management projects	USACE non-federal sponsors, which includes: ▪ Legally constituted public entities ▪ Non-profits	$10M max. federal expenditure per project	Contact District Engineer to request a study	Projects may be structural (e.g., levees, flood walls, diversion channels, pumping plants and bridge modifications) or non-structural (e.g., floodproofing, relocation of structures and flood warning systems)	✓				✓	✓	✓	✓
Continuing Authorities Program Section 206 -- Aquatic Ecosystem Restoration	U.S. Army Corps of Engineers	Developing aquatic ecosystem restoration and protection projects that improve the quality of the environment	USACE non-federal sponsors, which includes: ▪ Legally constituted public entities ▪ Non-profits	$10M max. federal expenditure per project	Contact District Engineer to request a study	Restore degraded aquatic ecosystems, e.g. estuary restoration, removal of in-stream barriers not associated with hydropower		✓			✓	✓	✓	✓
Invasive Aquatic Plant Removal	Maine DEP	Providing cost share grants for local projects to prevent the spread of invasive aquatic plants	▪ Municipal & county governments ▪ Quasi-municipal orgs ▪ 501c(3) eligible orgs	Minimum 20% cash match is required	Annual program. Next round TBA	Locally initiated courtesy boat inspection (CBI) programs		✓						✓
Maine Natural Resource Conservation Program	Maine DEP	Funding the restoration, enhancement, preservation, and creation of natural resources in Maine to maintain ecological benefits	▪ Municipalities ▪ Public agencies ▪ Non-profit conservation orgs	$6.9M total funds available	Annual program. Next round expected to be announced in May or June 2024	Restore, enhance, preserve, or create resources that best match the natural characteristics and values that were impacted. Projects that benefit habitat areas of statewide conservation significance, or other priority areas, are preferred		✓	✓					✓
Municipal Stream Crossing Upgrade Grant Program	Maine DEP	Improving public safety, minimizing impacts to water quality, and improving habitat for fish and wildlife	▪ Local governments ▪ Municipal conservation commissions ▪ Soil & water conservation districts ▪ Non-profits	$4M total funds available. Individual awards $150,000	TBA	Projects must be located on municipal roads and involve upgrades of culverts at stream crossings to improve public safety, minimize flooding and improve habitat for fish and wildlife	✓	✓						✓

Program Name	Dept./ Agency	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design/ Engineering	Implementation
Nonpoint Source Water Pollution Control Grants ("319")	Maine DEP	Helping communities make progress restoring or protecting waters named as NPS Priority Watersheds	▪ Municipalities ▪ State agencies ▪ Soil & water conservation districts ▪ Regional planning commissions ▪ Watershed districts ▪ Non-profits	$180,000 total funding available. Individual awards $10,000 - $50,000	RFPs issued annually in March	Implementation or development of a watershed-based plan		✓		✓	✓			✓
Overboard Discharge Elimination Program (Grants)	Maine DEP	Providing grants for the removal of individual overboard discharges of wastewater	▪ Municipalities ▪ Quasi-municipal orgs ▪ Unorganized territories ▪ Owners of an overboard	$350,000 total funding available. Individual funding amounts	Grants are assessed on a priority basis and are dependent on the	Projects which remove discharges from shellfishing areas or cause nuisance conditions will be given priority. Funding may be		✓						✓
Drinking Water Capacity Development Grants	Maine Dept. of Health and Human Services/ CDC	Sustaining and protecting publicly available drinking water	▪ Communities ▪ Non-profits ▪ Non-community public water systems	Grant amounts are for 75% of the document cost up to a max. grant amount of $30,000. Grants awarded on a reimburse-ment basis	Applica-tions accepted on a rolling basis until December 31, 2023 or funding has been fully disbursed	Projects should seek to bolster resilience to drought and flooding through infrastructure upgrades to public water systems	✓			✓	✓			
Drinking Water State Revolving Funds Loan	Maine Dept. of Health and Human Services/ CDC	Bolstering resilience to drought and flooding through infrastructure upgrades funded by low interest loans for capital improvement	▪ Public water systems	$81M total funding available	Annual program. Next round TBA	Public water system capital improvements	✓		✓					✓
Land Acquisition Loans	Maine Dept. of Health and Human Services/ CDC	Protecting drinking water supplies through ownership, easements, or other legal control of the land around a drinking water source	▪ Community water systems (private or public) ▪ Non-profit non-community water systems	No project limit. Based on available funds at time of applica-tion	Ongoing	Purchase of land and/or conservation easement that protect sources of drinking water			✓					✓

Program Name	Dept./ Agency	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design / Engineering	Implementation
Source Water (Surface Water) Protection Grant	Maine Dept. of Health and Human Services/ CDC	Funding the planning or implementation of projects that protect their surface water source	▪ Public community water systems ▪ Public non-profit non-community water systems	$400,000 total funding available Individual awards up to $20,000.	Annual program. Next RFP TBA	Projects should demonstrate a commitment to protection of drinking water source, e.g. developing or updating Watershed Management Plans, protective ordinances or legal agreements, education and public outreach				✓	✓			
Hazard Mitigation Grant Program	Maine Emergency Management Agency	Reducing future, long-term risk from natural hazards and increasing resilience to natural hazard events that may have been exacerbated by climate change	▪ Local governments ▪ State agencies ▪ Tribes or Tribal agencies ▪ Non-profits	25% local match required	Available only after a federally declared disaster	Risk-reduction projects that have been identified in local hazard mitigation plans prior to the occurrence of a federally-declared disaster	✓	✓	✓	✓				✓
Severe Repetitive Loss	Maine Emergency Management Agency	Reducing flood damages to insured properties that have had one or more claims to the National Flood Insurance Program	▪ National Floodplain Insurance Program participants		Ongoing	Acquisition or relocation of at-risk structures and conversion of the property to open space, elevation of existing structures, dry floodproofing of historic properties	✓		✓					✓
Maine Silver Jackets Funding Program	U.S. Army Corps of Engineers lead – Interagency Team of federal and state partners	Reducing flood hazards in Maine through coordination between the State and Federal government agencies	▪ Municipalities	Funding supports Army Corps of Engineers staff time to work on local projects	Ongoing	Non-structural flood mitigation projects				✓	✓	✓	✓	

Funding Opportunities for Coastal Resilience: **Private**

Program Name	Entity	Program Description	Eligible Applicants	Funding	Timeline	Eligible Projects	What's Fundable?							
							Project Category				Project Phase			
							Infrastructure upgrades	Habitat restoration & improvement	Land conservation	Planning & Policy	Planning	Monitoring	Design / Engineering	Implementation
ShoreUp Grant	Island Institute	Offering funding support for Maine island and coastal communities as they assess, implement, and/or plan for sea level rise	▪ Maine island and coastal communities	up to $10,000	Next round TBD	Projects can include risk assessments, infrastructure and natural resource planning, community engagement programs related to sea level rise	✓	✓		✓	✓	✓	✓	✓
Funding for Maine Coastal and Marine Climate Action	Broad Reach Fund and Builders Initiative	Support projects that are aligned with coastal and marine related recommendations of the Maine's climate plan	▪ Municipalities ▪ State agencies ▪ Tribal governments ▪ Non-profits ▪ Academic institutions	$1.5M available in 2023. Grant awards to range from $20,000 up to $200,000	Next round TBD	Habitat protection and restoration; ocean acidification understanding, monitoring, and mitigation; blue carbon sequestration; data collection; monitoring; emergence or transfer of traditional ecological knowledge		✓	✓	✓	✓	✓	✓	✓

Other Funding Guides

- ***Ocean Climate Funding for Coastal Cities***: Released in August 2023 by the Urban Ocean Lab, a guidebook for quickly navigating federal funding opportunities for coastal resilience and marine climate projects. Provides a directory of funding opportunities worth over $21.7 billion to support climate preparedness and resilience in coastal cities made possible by the Inflation Reduction Act and the Infrastructure Investment and Jobs Act.
- ***Maine Government Funding Sources for Resiliency***: Released September 3, 2021 by Maine DEP
- ***Nature-based Solutions Funding Database***: National Wildlife Federation's interactive database for communities interested in pursuing federal funding and/or technical assistance for nature-based solutions. Use the filters below to search for nature-based solutions funding and technical assistance resources that fit your needs.

POLICY CONSIDERATIONS/ RESOURCE GUIDE

In order to support a more flood resilient future, many communities are reviewing policies and zoning. The following page includes policy resources related to sea-level rise that are intended to serve as helpful tools when considering building height limits related to raising of structures, stormwater runoff associated with impervious surfaces and FEMA's community rating system.

FEMA COMMUNITY RATING SYSTEM
https://www.fema.gov/floodplain-management/community-rating-system

MUNICIPAL GUIDANCE for COASTAL RESILIENCE
https://smpdc.org/vertical/Sites/%7B14E8B741-214C-42E2-BE74-5AA9EE0A3EFD%7D/uploads/Municipal_Guidance_For_Coastal_Resilience_Model_Ordinance_Lanugage_for_ME_Municipalities_April_2022.pdf

OVERLAY ZONES
https://www.georgetownclimate.org/adaptation/toolkits/managed-retreat-toolkit/zoning-and-overlay-zones.html

NORFOLK'S RESILIENCE-QUOTIANT ZONING
https://www.planning.org/planning/2018/aug/silverlining/

ZONING FOR SEA-LEVEL RISE
https://www.georgetownclimate.org/files/report/Zoning%20for%20Sea-Level%20Rise%20Executive%20Summary%20Final.pdf

MUNICIPAL ZONING OPTIONS for ADAPTATION to SEA LEVEL RISE IN CONNECTICUT
https://scrcog.org/wp-content/uploads/hazard_mitigation/background_material/TNC_CT_Municipal_Zoning_Options-for-SLR.pdf

CLIMATE RESILIENT DEVELOPMENT at the LOCAL LEVEL: ZONING in RESPONSE to SEA LEVEL RISE
https://pelr.blogs.pace.edu/2023/04/12/climate-resilient-development-at-the-local-level-zoning-in-response-to-sea-level-rise/

OVERLAY ZONES for CLIMATE RESILIENCE
https://resilientconnecticut.media.uconn.edu/wp-content/uploads/sites/3830/2023/10/Overlay-Zones-10.12.23.pdf

APPENDIX

Camden Public Library Statement on Harbor Park

April 2024

Camden's Harbor Park was a gift to the people of Camden from Mary Louise Curtis Bok nearly a hundred years ago. Its landscape, designed by Olmsted Brothers, is a historic and scenic treasure that is a defining landmark of the town and harbor. The Camden Public Library Board of Trustees is the steward of Harbor Park.

In recent years, more frequent and intense instances of extreme weather, such as higher tides and stronger winds and storms, are causing repeated and increasing degradation to Harbor Park's shoreline in the form of erosion and structural damage. One-time fixes are no longer financially responsible or sufficient in scope to maintain the safety and appearance of Harbor Park. The Trustees believe that a more extensive project – which may comprise repair, restoration, and / or renovation – is now required to make Harbor Park a safe and appealing public space that will be resilient in the face of projected extreme weather events and rising sea levels.

The Trustees are aware that the Town of Camden is presently investigating an extensive environmental project to address sea level rise in and around Camden, along with river and habitat restoration, which will impact Harbor Park. If such a project is approved by the voters of Camden, to assist the Town and other agencies engaged in the design of a comprehensive solution, the Trustees wish to express their priorities for any project which encompasses Harbor Park. Rather than directing or prescribing a specific solution or components thereof, the Trustees have identified the following important Harbor Park features and usage requirements considered necessary in any proposed design.

- Of utmost importance is fealty to the design philosophy of Olmsted Brothers and the expressed interests of Mary Louise Curtis Bok, who desired to provide a space of beauty and enjoyment for all people. Olmsted's design approach was characterized by a deep appreciation for nature, a commitment to social and environmental values, and a belief in the transformative power of well-designed landscapes to enrich lives, strengthen communities, and harmonize human and natural systems. As noted in Olmsted's correspondence, instantiations of these sentiments in Harbor Park included open grassy grounds like a "New England Common," simple curved pathways, unadorned space, rugged native trees and plants (not flowering), grading that provided unobstructed views into and through the park from various points, and screening plantings to block the view of built structures, to create a place of respite set apart from the town. These features remain as desirable today as 100 years ago.

- Functionally, any proposed design must eliminate or reduce damage to the shoreline and Harbor Park grounds due to weather and water-related events. Grounds and structures should be resilient and maintainable to meet projected year 2100 storm and tide levels and should limit additional maintenance or cost. This is the immediate impetus behind any project, and as such is the Trustees' primary goal.

- Ideally, any proposed design should conserve as much of the current Harbor Park grounds as possible. At the same time, the Trustees believe that a new opportunity exists to expand the usable footprint of Harbor Park into the intertidal zone, which has evolved from a site of industry into one of recreation. The Trustees favor a design that provides direct access to the shoreline, includes pathways and viewing areas as close to the shoreline as possible, and creatively expands the space for recreation and education in the intertidal zone.

- In support of the Library's mission, educational components – such as informational signs and a land acknowledgement – should be included in any proposed design, which should be compliant with Maine Historic Preservation Commission standards.

- Aesthetically, any proposed design should adhere to the original plan's emphasis on creating an oasis of simple, natural beauty by: incorporating native plants and trees; seamlessly integrating the upper and lower parks; maintaining the simple curved pathways; obscuring unattractive built structures; providing an enclosed and framing view both of the harbor from the Library, Amphitheater and Park, and of the mountains from the harbor; and setting the Park apart from its surroundings.

- Socially, any alterations to Harbor Park should improve safety and usability, including four-season considerations and accommodations for those with disabilities (ADA compliant). Steep pathways, stairways, utility protrusions, loose gravel, and geese all present hazards.