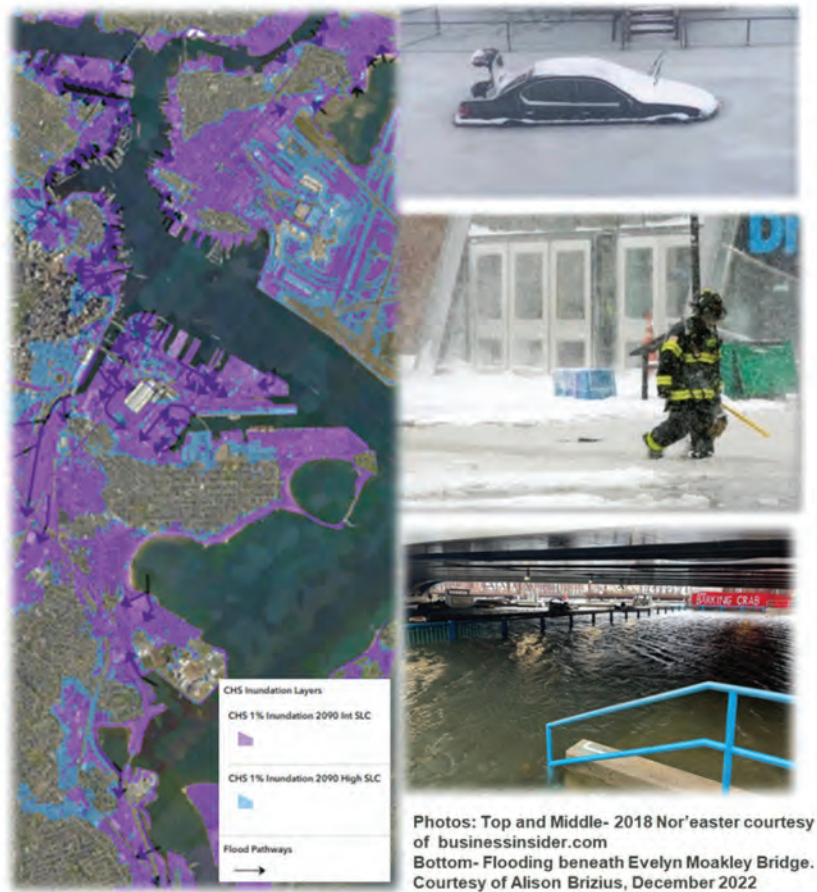


Boston Coastal Storm Risk Management Study

Draft Integrated Feasibility Report and Programmatic Environmental Assessment



APPENDIX D - ENVIROMENTAL

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USACE New England District | City of Boston



Boston Coastal Storm Risk Management Study
Integrated Feasibility Report and Programmatic
Environmental Assessment

Draft Appendix D

Natural Environment
Additional Information on Existing Conditions

July 2026

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1.0 Introduction

This appendix provides additional information on the existing natural environment and resources that may occur in the Boston Coastal Storm Risk Management (CSRM) Integrated Feasibility Report with Programmatic Environmental Assessment, Boston, Massachusetts.

2.0 Protected Species

2.1 Federally Listed Species

The U.S. Army Corps of Engineers (USACE) is mandated by Section 7 of the Endangered Species Act to consult with the Secretary of Commerce (NOAA Fisheries) and the Secretary of Interior (U.S. Fish and Wildlife Service [USFWS]) to determine if any Federally protected species may be affected by a project. There are 12 Federally listed threatened and endangered species that may occur within the Boston CSRM project area, including birds, fish, terrestrial and marine mammals, and marine reptiles (Table D2-1).

Table D2-1. List of federally threatened and endangered species possibly found within the study area. Information sourced from USFWS IPaC and NMFS Section 7 Mapper for the Greater Atlantic Region (NOAA-NMFS, 2026; USFWS, 2026). Presence is specific to the Gulf of Maine (GOM) region. Protection status listed is based on GOM Distinct Population Segments for marine species where noted with an asterisk, otherwise based on the entire species range. T=threatened; E=endangered; PT=proposed threatened; PE=proposed endangered.

Species	Status	Seasonal Presence	Characteristics
Bird			
Piping Plover <i>Charadrius melodus</i>	T	March – Sept	Nest on popular urban beaches; found in Dorchester
Roseate Tern <i>Sterna dougallii dougallii</i>	E	August	Found in all Boston neighborhoods
Insect			
Monarch Butterfly <i>Danaus plexippus</i>	PT	May-Sept	Long distance migration to/from overwintering sites; rely on milkweed
Terrestrial Mammal			
Tricolored Bat <i>Perimyotis subflavus</i>	PE	Year Round	Hibernating in caves in winter; roosting/foraging in spring – fall
Fish			
Atlantic Sturgeon* <i>Acipenser oxyrinchus oxyrinchus</i>	T	Year Round	Adult/subadults forage and migrate along the coast to/from their natal rivers
Shortnose Sturgeon* <i>Acipenser brevirostrum</i>	E	April-November	Adults forage and may migrate in ocean north of Merrimack River, MA

Marine Mammal			
Fin Whale <i>Balaenoptera physalus</i>	E	Year Round	Forage all year in MA Bay; overwinter on Stellwagen Bank Nov-March
North Atlantic Right Whale <i>Eubalaena glacialis</i>	E	Year Round	Forage Jan- April in MA Bay; Nov-Jan overwinter on Stellwagen Bank
Reptile			
Green Turtle <i>Chelonia mydas</i>	T	June-November	Feed/migrate north of Cape Cod in June; return south when waters cool
Kemp's Ridley Turtle <i>Lepidochelys kempii</i>	E	June-November	Feed/migrate north of Cape Cod in June; return south when waters cool
Leatherback Turtle <i>Dermochelys coriacea</i>	E	June-November	Feed/migrate north of Cape Cod in June; return south when waters cool
Loggerhead Turtle <i>Caretta caretta</i>	T	June-November	Feed/migrate north of Cape Cod in June; return south when waters cool

Of the protected fish species, the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*) have populations that span the north Atlantic coast and Gulf of Maine. Though both are anadromous, the shortnose sturgeon spends most of its life in upstream rivers with little time in saltwater along the coast. This species is known to occur in the Connecticut and Merrimack Rivers with extremely rare historic appearances in tributaries of Boston Harbor. Migration of shortnose sturgeon in the Connecticut River is restricted by hydroelectric dams resulting in one of the few populations to live exclusively in freshwater (NMFS, 2023). Only one river in Massachusetts, the Merrimack, is known to support Atlantic sturgeon. Boston Harbor and its main tributaries, the Charles, Mystic, and Neponset Rivers, are not known to be current or historical diadromous fish passage for these species (MassGIS, 2023). As such, while juvenile and adult Atlantic sturgeon may be found in the harbor, no spawning adults, eggs, or larvae are expected to be present within the study area.

There are multiple whale species with critical habitat spanning the northeast Atlantic, but outside the study area. Of note is the North Atlantic Right Whale (*Eubalaena glacialis*) – a highly migratory, critically endangered species that is largely at risk from fishing gear entanglements and boat strikes. Although the project area exists within this listed species' ranges, whales rarely venture far into Boston Harbor where project work will be done. Fin whales (*Balaenoptera physalus*) are similarly listed within the study area but are unlikely to be affected by the project. Adults and juveniles of all listed sea turtle species may occur in the Gulf of Maine region in summer and early fall for foraging and migration (NOAA-NMFS, 2022a). However, they are unlikely to be present in the study

area, which is exclusively in the inner harbor and tributaries where they are considered rare.

The tricolored bat (*Perimyotis subflavus*) has been listed as proposed endangered. One of the smallest species of bats native to North America, it has an expansive range from the central U.S. to the eastern seaboard, spanning into parts of Canada and as far south as central America (USFWS, 2024). Tricolored bats can be found hibernating in caves and mines in the winter and roosting in forested habitats in the spring, summer, and fall. These bats prefer to roost in live or dead deciduous hardwood trees, primarily in leaf clusters. They are also being significantly impacted by white-nose syndrome, with areas affected by the disease showing 90-100% declines in winter colony abundance. Although tricolored bats may transit through the project areas, the immediate habitat does not support persistent bat presence.

The piping plover (*Charadrius melodus*), Federally listed as threatened, has been identified by IPaC as potentially present in South Boston and Dorchester neighborhoods of the study area. The Atlantic coast population of piping plover breeds and nests on sandy beaches from Newfoundland to northern South Carolina. Massachusetts currently has the largest population with nearly 700 breeding pairs (MA NHESP, 2015a). Piping plovers return to breeding sites in Massachusetts around late March and April. After laying eggs, plover parents take turns incubating the eggs for 26-28 days when they hatch. Chicks can feed themselves almost immediately, but it can take four to five weeks before they fledge. In late July to early September, piping plovers begin their southward migration to wintering grounds along the Atlantic and Gulf Coast from North Carolina to Mexico and into the Caribbean. Piping plovers forage invertebrates from substrate by gleaning or running and pecking in areas such as beaches, intertidal areas, lagoons, salt marshes, and other similar coastal habitats that are found on the Atlantic Coast. Piping plovers have been found to nest along beaches in South Boston and Dorchester.

The northeastern population of the roseate tern (*Sterna dougallii dougallii*) was designated as Federally endangered on 2 November 1987. Roseate terns were once abundant, but a variety of threats have resulted in reduced populations. According to the 1998 U.S. Fish and Wildlife Service (USFWS) Roseate Tern Recovery Plan – Northeastern Population, the numbers of roseate terns were severely reduced in the 1870's and 1880's by commercial hunting for the millinery trade. The total number of roseate terns was estimated to be roughly 2,000 pairs at the lowest point in about 1890, but by 1930 the population had grown to roughly 8,500 pairs with the majority based in Massachusetts (USFWS, 1998). Roseate tern populations increased following protection efforts but declined again to a low of 2,500 pairs in 1977 due to habitat loss and gull encroachment.

Roseate terns generally nest on sandy, gravelly, or rocky islands. Per the U.S. Fish and Wildlife Service Caribbean Roseate Tern and North Atlantic Roseate Tern (*Sterna*

dougallii dougallii) 5-Year Review: Summary and Evaluation, in 2009, approximately 94% of the population of roseate tern pairs were concentrated at just 3 colonies: Great Gull Island, NY; Bird Island, Marion, MA; and Ram Island, Mattapoisett, MA (USFWS, 2020). Roseate terns feed almost exclusively on small and/or juvenile fish, occasionally including crustaceans and insects in its diet. Its feeding habits are specialized, consuming primarily sand lance. Roseate terns capture food mainly by plunge-diving (diving from heights of 1-12 m and often submerging to ≥ 50 cm), but also by surface-dipping and contact-dipping (MA NHESP, 2015b). Roseate terns are unlikely to occur in the study area. Although there have been a few recent sightings in nearby Quincy, the last reported sighting within the study area occurred in South Boston over a century ago (Cornell Lab of Ornithology, n.d.).

The monarch butterfly (*Danaus plexippus*) was listed as proposed threatened in December 2024. Monarch butterfly populations found in the northeastern U.S. breed and lay eggs in their overwintering sites along the southern U.S. and northern Mexico (MA Audubon, n.d.). After breeding, they embark on a northward migration arriving in Massachusetts around May. Many of the local spring/summertime populations only live for two to five weeks while their overwintering counterparts can survive for six to nine months (MA Audubon, n.d.). The overwintering generation initiates a southward migration from Massachusetts around September. Monarch caterpillars have a highly specialized diet that only includes species of milkweed (*Asclepias* spp.). Of the *Asclepias* spp. within the study area that monarch caterpillars may rely on, whorled milkweed (*Asclepias verticillata*) is listed as threatened under the Massachusetts endangered species act (MA NHESP, 2019b).

2.2 American Bald and Golden Eagle Act of 1972

Although the bald eagle (*Haliaeetus leucocephalus*) is no longer federally listed it is protected under the American Bald and Golden Eagle Act of 1972. The USFWS National Bald Eagle Management Guidelines (2007) provide general recommendations for land management practices that will benefit bald eagles, describe the potential for various human activities that disturb bald eagles, and encourage land management practices that benefit bald eagles. Over the past decade, there have been only sporadic sightings of bald eagles in most of Boston, with exception to the Neponset River Estuary and Belle Isle Marsh Areas of Critical Environmental Concern within the study area where sightings have been more common (Cornell Lab of Ornithology, n.d.).

To avoid disturbing bald eagles, a nest buffer is recommended between the human activity and the nest where applicable. Human impacts are considered detrimental to nesting success within the primary buffer (330 feet from nest) and within the secondary buffer (660 feet from nest) human impacts are thought to impact the quality of the primary buffer. Human activities that are considered detrimental to breeding activities (e.g. development, logging, use of toxic chemicals, etc.) are to be limited within the primary buffer and those that could impact the integrity of the primary buffer are restricted within a secondary buffer (e.g. developments, roadways, etc.). Per the

Management Guidelines, a nest buffer of 2,640 feet is recommended from the nest for loud, disturbing noises such as those caused by blasting and other loud, intermittent noises.

Bald eagles typically breed and winter in forested areas adjacent to large bodies of water. However, such areas must have an adequate food base, perching areas, and nesting sites. Throughout its range, it selects large, super-canopy roost trees that are open and accessible. Nests are constructed from an array of sticks placed in an interwoven pattern. Other materials added as fillers may include grasses, mosses, even corn stalks.

2.3 Marine Mammals

The harbor seal (*Phoca vitulina concolor*), also known as the common seal, is found throughout coastal waters of the Atlantic Ocean from Canada to southern New England, New York, and adjoining seas (Waring *et al.*, 2004) above 30° N latitude. Harbor seals spend the late spring, summer, and early fall between New Hampshire and the Arctic, where they breed and care for newly born pups. A general southward movement from the Bay of Fundy to southern New England waters occurs in fall and early winter, mostly consisting of juveniles and subadults. Whitman and Payne (1990) have suggested that this age-related dispersal may reflect the higher energy requirements of younger individuals. After overwintering in southern New England and New York coastal waters, the vast majority of the population migrates to the northern waters of New Hampshire, Maine, and Canada in the spring for the pupping season (mid-May through June). No pupping areas have been identified in the project areas. The harbor seal is not listed as threatened or endangered under the Endangered Species Act (ESA), and it is not considered a strategic stock (i.e., a stock whose mortality is at a level that will destroy the population) by NMFS.

The white-sided dolphin (*Lagenorhynchus acutus*) occurs in temperate and polar waters in the North Atlantic Ocean, typically over the continental shelf to the 330-foot depth contour. White-sided dolphins are potential, but rare visitors to the outer project areas in Massachusetts Bay. The white-sided dolphin is not listed as threatened or endangered under the ESA and is not considered a strategic stock by NMFS. The habitat range of the white-sided dolphin is generally in deeper waters of the continental shelf and therefore would rarely be found in the inner Boston Harbor but have been sighted around the Boston Harbor Islands.

The harbor porpoise (*Phocoena phocoena*) is primarily an inshore species. During the summer, harbor porpoises are concentrated in the northern Gulf of Maine and the southern Bay of Fundy region, generally in waters less than 490 feet deep. This stock of harbor porpoises migrates south into the mid-Atlantic region during the fall and spring months; they are widely distributed from New Jersey to Maine. Low densities of harbor porpoises are found in waters off New York and north to Canada in the winter. No specific migratory routes to the Gulf of Maine/Bay of Fundy region have been identified. The best estimate for the abundance of the Gulf of Maine/Bay of Fundy population is 89,700 animals, with a minimum population estimate of 74,695 (Waring *et al.*, 2004).

During the period of 1994 to 2001, 831 harbor porpoise strandings were reported from Maine to North Carolina, with only 27 strandings in 2000. Massachusetts alone had 219 strandings during this period. No specific information on locations in Massachusetts was available. NMFS considers the Gulf of Maine/Bay of Fundy harbor porpoise stock as a strategic stock, though the stock has preliminarily been removed from the ESA candidate species list by the NMFS (Waring *et al.*, 2004). The preferred nearshore habitat of the harbor porpoise makes it a potential species to be found in the Boston Harbor area.

The gray seal (*Halichoerus grypus*) is found on both sides of the North Atlantic. The western North Atlantic population occurs from New England to Labrador (Waring *et al.*, 2004). Gray seals inhabit temperate and sub-arctic waters and are found from Maine to Long Island Sound in the United States. There are two breeding concentrations in eastern Canada, one at Sable Island and a second that breeds on the pack ice in the Gulf of St. Lawrence. A small number of animals and pupping have been observed on several isolated islands along the Maine coast and in Nantucket-Vineyard Sound, Massachusetts. Gray seals are the second most common pinniped along the Atlantic coast of the US, living on remote, exposed islands, shoals, and unstable sandbars. Pupping occurs from late December through mid-February. There are no regular seasonal migrations, but young individuals wander extensively during their first two years of life. Gray seals feed on a wide variety of fish (Lesage and Hammil, 2001) as well as squid, octopus, crustaceans and even a seabird or two. The majority of dives are to depths of 230 to 328 feet, but gray seals can dive to depths greater than 1,312 feet.

Minke whales (*Balaenoptera acutorostrata*) occur throughout polar, temperate, and tropical waters. The minke whale is the third most abundant great whale in the Atlantic Ocean within 200 nmi of the U.S. coastline (Winn, 1982). Minke whales off the east coast of the United States are part of the Canadian east coast population, one of four minke populations recognized in the North Atlantic. The range of this population extends south from Canada to the Gulf of Mexico, but distribution is primarily concentrated in New England waters, with most sightings occurring in the spring and summer months. Based on surveys conducted in 1995 and 1999, the best available current abundance estimate for minke whales in the western North Atlantic is 4,018 animals, with a minimum estimate of 3,515 animals (Waring *et al.*, 2004). This species is found in open seas primarily over continental shelf waters, but it occasionally enters bays, inlets, and estuaries. Minke whales may occasionally visit Boston Harbor and Massachusetts Bay, as is made evident by a recent minke whale mortality report. In 2001, a minke whale was found dead in Massachusetts Bay (42° 21'N 70° 43'W) with fairly fresh entanglement marks on the tail stock and across the tail flukes (Waring *et al.*, 2004). The minke whale is not listed as threatened or endangered under the ESA, as depleted under the MMPA, or as a strategic stock by NMFS.

2.4 State Listed Species

The following table provides the Massachusetts state-listed protected species counts by taxonomic group (MA NHESP, 2020b). These counts include all state listed species that may occur in all neighborhoods of Boston (Tables D2-2, D2-3).

Table D2-2. Taxonomic breakdown of state listed species that may occur throughout the City of Boston, including in neighborhoods that are not part of this study.

	Amphibian	Insect	Bird	Fish	Mussel	Reptile	Vascular Plant	Total
Endangered		2	4				6	12
Threatened	1	2	5	1			14	23
Special Concern	1	5	7		1	1	3	18
Total	2	9	16	1	1	1	23	53

Table D2-3. Full species list of state listed species that may occur throughout the City of Boston, including in neighborhoods that are not part of this study.

TAXONOMIC GROUP	COMMON NAME	SCIENTIFIC NAME	STATUS	LAST OBSV
Amphibian	Blue-spotted Salamander (complex)	<i>Ambystoma laterale</i> pop. 1	Special Concern	2015
Amphibian	Eastern Spadefoot	<i>Scaphiopus holbrookii</i>	Threatened	1932
Beetle	Hentz's Red-bellied Tiger Beetle	<i>Cicindela rufiventris hentzii</i>	Threatened	1927
Beetle	Purple Tiger Beetle	<i>Cicindela purpurea</i>	Special Concern	1928
Beetle	Twelve-spotted Tiger Beetle	<i>Cicindela duodecimguttata</i>	Special Concern	1910
Bird	Barn Owl	<i>Tyto alba</i>	Special Concern	1989
Bird	Common Loon	<i>Gavia immer</i>	Special Concern	1824
Bird	Common Tern	<i>Sterna hirundo</i>	Special Concern	2017
Bird	Eastern Meadowlark	<i>Sturnella magna</i>	Special Concern	2015
Bird	Golden-winged Warbler	<i>Vermivora chrysoptera</i>	Endangered	Historic
Bird	Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Threatened	1993
Bird	King Rail	<i>Rallus elegans</i>	Threatened	2019
Bird	Least Bittern	<i>Ixobrychus exilis</i>	Endangered	2019
Bird	Least Tern	<i>Sternula antillarum</i>	Special Concern	2017
Bird	Long-eared Owl	<i>Asio otus</i>	Special Concern	2018
Bird	Peregrine Falcon	<i>Falco peregrinus</i>	Threatened	2019
Bird	Piping Plover	<i>Charadrius melodus</i>	Threatened	2019
Bird	Saltmarsh Sparrow	<i>Ammospiza caudacuta</i>	Special Concern	2019

Bird	Short-eared Owl	<i>Asio flammeus</i>	Endangered	2019
Bird	Upland Sandpiper	<i>Bartramia longicauda</i>	Endangered	2015
Bird	Vesper Sparrow	<i>Poocetes gramineus</i>	Threatened	1985
Butterfly/Moth	Barrens Metarranthus	<i>Metarranthus apiciaria</i>	Endangered	1934
Butterfly/Moth	Coastal Heathland Cutworm	<i>Abagrotis benjamini</i>	Special Concern	2001
Butterfly/Moth	New Jersey Tea Inchworm	<i>Apodrepanulatrix liberaria</i>	Endangered	Historic
Butterfly/Moth	Orange Sallow Moth	<i>Pyrrhia aurantiago</i>	Special Concern	1988
Dragonfly/Damselfly	Mocha Emerald	<i>Somatochlora linearis</i>	Special Concern	2009
Dragonfly/Damselfly	Ringed Boghaunter	<i>Williamsonia lintneri</i>	Threatened	1994
Fish	Threespine Stickleback	<i>Gasterosteus aculeatus</i>	Threatened	2019
Mussel	Eastern Pondmussel	<i>Ligumia nasuta</i>	Special Concern	1841
Reptile	Eastern Box Turtle	<i>Terrapene carolina</i>	Special Concern	1939
Vascular Plant	Adder's Tongue Fern	<i>Ophioglossum pusillum</i>	Threatened	1884
Vascular Plant	American Sea-blite	<i>Suaeda calceoliformis</i>	Special Concern	1909
Vascular Plant	Bristly Foxtail	<i>Setaria parviflora</i>	Special Concern	2001
Vascular Plant	Britton's Violet	<i>Viola brittoniana</i>	Threatened	1909
Vascular Plant	Clustered Sanicle	<i>Sanicula odorata</i>	Threatened	Historic
Vascular Plant	Green Adder's-mouth	<i>Malaxis unifolia</i>	Threatened	1883
Vascular Plant	Green Rock-cress	<i>Boechera missouriensis</i>	Threatened	1930
Vascular Plant	Large-bracted Tick-trefoil	<i>Desmodium cuspidatum</i>	Threatened	1896
Vascular Plant	Lesser Snakeroot	<i>Ageratina aromatica</i>	Endangered	1896
Vascular Plant	Long's Bulrush	<i>Scirpus longii</i>	Threatened	1907
Vascular Plant	Long-leaved Bluet	<i>Houstonia longifolia</i>	Endangered	1918
Vascular Plant	New England Blazing Star	<i>Liatris novae-angliae</i>	Special Concern	1933
Vascular Plant	Pale Green Orchid	<i>Platanthera flava</i> var. <i>herbiola</i>	Threatened	1908
Vascular Plant	Purple Needlegrass	<i>Aristida purpurascens</i>	Threatened	1800s
Vascular Plant	Seabeach Dock	<i>Rumex pallidus</i>	Threatened	1984
Vascular Plant	Seabeach Needlegrass	<i>Aristida tuberculosa</i>	Threatened	1877
Vascular Plant	Slender Cottongrass	<i>Eriophorum gracile</i>	Threatened	1885
Vascular Plant	Slender Water-milfoil	<i>Myriophyllum alterniflorum</i>	Endangered	Historic
Vascular Plant	Small-flowered Buttercup	<i>Ranunculus micranthus</i>	Endangered	1891
Vascular Plant	Stiff Yellow Flax	<i>Linum medium</i> var. <i>texanum</i>	Threatened	1909
Vascular Plant	Taperleaf Water-horehound	<i>Lycopus rubellus</i>	Endangered	1896
Vascular Plant	Walter's Sedge	<i>Carex striata</i>	Endangered	Historic
Vascular Plant	Whorled Milkweed	<i>Asclepias verticillata</i>	Threatened	1878

2.5 Migratory Birds

Table D2-4 provides a comprehensive list of migratory birds that may be found in the study area. Not Applicable (N/A) indicates that species does not breed in the study area. Birds of conservation concern are identified (denoted with an asterisk) pursuant to the 1988 amendment to the Fish and Wildlife Conservation Act. Multiple species (n=26) are designated Birds of Conservation Concern (BCC), which describes all nongame birds that are in danger of becoming candidates for listing under the endangered species act if additional conservation measures are not taken. C=Charlestown; D=Dorchester; DT=Downtown and North end; EB=East Boston; SB=South Boston

Table D2-4. Full list of migratory bird species that may occur in the study area. The breeding seasons is provided for each species and which study neighborhoods the species may occur in.

Common Name	Scientific Name	Breeding Season	Study Areas
American Oyster Catcher*	<i>Haematopus palliatus</i>	Apr 15 - Aug 31	ALL
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Oct 15 - Aug 31	ALL
Black Guillemot	<i>Cephus grylle</i>	May 15 - Sep 10	D, EB
Black Scoter	<i>Melanitta nigra</i>	N/A	D, EB, SB
Black Skimmer*	<i>Rynchops niger</i>	May 20 - Sep 15	ALL
Black-billed Cuckoo*	<i>Coccyzus erythrophthalmus</i>	May 15 - Oct 10	ALL
Black-legged Kittiwake	<i>Rissa tridactyla</i>	N/A	D, EB, SB
Blue-winged Warbler*	<i>Vermivora pinus</i>	May 1 - Jun 30	ALL
Bobolink*	<i>Dolichonyx oryzivorus</i>	May 20 - Jul 31	ALL
Brown Pelican	<i>Pelecanus occidentalis</i>	Jan 15 - Sep 30	D, EB, SB
Canada Warbler*	<i>Cardellina canadensis</i>	May 20 - Aug 10	ALL
Cerulean Warbler*	<i>Dendroica cerulea</i>	Apr 29 - Jul 20	ALL
Chimney Swift*	<i>Chaetura pelagica</i>	Mar 15 - Aug 25	ALL
Common Eider	<i>Somateria mollissima</i>	Jun 1 - Sep 30	D, EB, SB
Common Loon	<i>Gavia immer</i>	Apr 15 - Oct 31	D, EB, SB
Cory's Shearwater*	<i>Calonectris diomedea</i>	N/A	EB, SB
Dovekie	<i>Alle alle</i>	N/A	EB, SB
Eastern Whip-poor-will*	<i>Astrostomus vociferus</i>	May 1 - Aug 20	C, DT, EB, SB
Great Shearwater	<i>Puffinus gravis</i>	N/A	D, EB, SB
Hudsonian Godwit*	<i>Limosa haemastica</i>	N/A	ALL
Kentucky Warbler*	<i>Oporornis formosus</i>	Apr 20 - Aug 20	C, D, DT, SB
King Rail*	<i>Rallus elegans</i>	May 1 - Sep 5	C, DT, EB, SB
Lesser Yellowlegs*	<i>Tringa flavipes</i>	N/A	ALL
Long-eared Owl*	<i>Asio otus</i>	Mar 1 - Jul 15	C, D, DT, SB
Long-tailed Duck	<i>Clangula hyemalis</i>	N/A	EB, SB
Magnificent Frigatebird*	<i>Fregata magnificens</i>	N/A	D, SB
Manx Shearwater*	<i>Puffinus puffinus</i>	Apr 15 - Oct 31	D, EB, SB
Prairie Warbler*	<i>Dendroica discolor</i>	May 1 - Jul 31	ALL

Common Name	Scientific Name	Breeding Season	Study Areas
Prothonotary Warbler*	<i>Protonotaria citrea</i>	Apr 1 - Jul 31	C, D, DT, SB
Purple Sandpiper*	<i>Calidris maritima</i>	N/A	ALL
Razorbill	<i>Alca torda</i>	Jun 15 - Sep 10	D, EB, SB
Red-breasted Merganser	<i>Mergus serrator</i>	N/A	D, EB, SB
Red-headed Woodpecker*	<i>Melanerpes erythrocephalus</i>	May 10 - Sep 10	C, D, DT, SB
Red-necked Phalarope	<i>Phalaropus lobatus</i>	N/A	D, EB, SB
Red-throated Loon	<i>Gavia stellata</i>	N/A	D, EB, SB
Ring-billed Gull	<i>Larus delawarensis</i>	N/A	D, EB, SB
Roseate Tern	<i>Sterna dougallii</i>	May 10 - Aug 31	D, SB
Royal Tern	<i>Thalasseus maximus</i>	Apr 15 - Aug 31	D, EB, SB
Ruddy Turnstone*	<i>Arenaria interpres morinella</i>	N/A	ALL
Rusty Blackbird*	<i>Euphagus carolinus</i>	N/A	ALL
Short-billed Dowitcher*	<i>Limnodromus griseus</i>	N/A	ALL
Surf Scoter	<i>Melanitta perspicillata</i>	N/A	D, EB, SB
Thick-billed Murre	<i>Uria lomvia</i>	Apr 15 - Aug 15	D, EB, SB
White-winged Scoter	<i>Melanitta fusca</i>	N/A	D, EB, SB
Willet*	<i>Tringa semipalmata</i>	Apr 20 - Aug 5	ALL
Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	N/A	D, EB, SB
Wood Thrush*	<i>Hylocichla mustelina</i>	May 10 - Aug 31	ALL

Information sourced from the USFWS Information for Planning and Consultation (IPaC) tool in conjunction with ebird.org.

3.0 Shellfish

Benthic sampling was conducted within the harbor for the Boston Harbor Deep Draft Project (Massport, 2003). Although designed to collect benthic infaunal community data, the sampling effort also generated data pertaining to shellfish presence in the area. Absence of a species from samples collected does not necessarily mean that the species does not occur in the project area.

Mystic River - Habitat for softshell clams has been identified by the Massachusetts Division of Marine Fisheries (MA DMF) along the northern bank of the Mystic River. The bottom type within these areas is mostly mud, which is consistent with the preferred substrate of softshell clams (fine sediments). Grab samples collected within the deepening area did not contain harvestable shellfish species (Pellegrino, 2003).

Chelsea River - The bottom type within the Chelsea River is a heterogeneous mix of gravel and sand, with areas of finer sediments (silt, mud, clay). Softshell clam habitat is present along the banks of the Chelsea River, with smaller areas of razor clam and blue mussel habitat in the upper reaches of the river. The presence of softshell clam was

confirmed by one grab sample collected in the general area of this identified habitat (Massport, 2003).

Inner Harbor – This area is defined as water from the confluence of the Mystic and Chelsea Rivers to tip of Governor's and Castle Islands. Mud and clay are the predominant sediment types within the Inner Harbor. No suitable shellfish habitat is identified by MA DMF within the Inner Harbor with exception to a small patch of softshell clam habitat within the inlet between Jeffries Point and Logan Airport in East Boston's. Blue mussel and Jonah crab were present in grab samples collected at North Jetty, just to the north of the Reserved Channel, in an area of mud and sand (Massport, 2003). Blue mussels were also present in samples from Conley Terminal within the Reserved Channel. Environmental Protection Agency (EPA) staff have previously noted European oysters (*Ostrea edulis*) along the East Boston shoreline.

Lower Harbor – This area is defined as waters extending from the outer edge of the inner harbor to the tip of Deer Island, bounded on the southern edge by Long and Spectacle Islands. Suitable habitat for several shellfish species is present along the coastline of the Lower Harbor. Softshell clam habitat exists along almost the entire coastline of the harbor north of the channel and along the coastline and shores of the islands (*i.e.*, Long Island, Spectacle Island, Thompson Island) to the south of the channel. This habitat is interspersed with large areas of blue mussel habitat and smaller, localized razor clam habitat. Blue mussel habitat is also located just outside the Presidents Roads Anchorage and Channel at the tip of Deer Island. These habitats coincide with areas of mixed coarse and fine-grained sediment or rock. Rock crabs were present in the grab samples collected within the Presidents Roads Anchorage and Main Ship Channel (Pellegrino, 2003). EPA staff have also previously noted European oysters along the Winthrop shoreline.

Recent data describing the distribution of shellfish in Boston Harbor are very limited. Potential habitat for several commercially and recreationally important species of shellfish (softshell clam, blue mussels, razor clams, and sea scallops) occurs along the banks of the Chelsea and Mystic Rivers and along the coastlines of the Lower and Harbor (Pellegrino, 2003; Massport, 2003). Of these species, softshell clam is the most common commercially harvested shellfish within Massachusetts and Boston Harbor. Most of the productive softshell clam beds are closed for harvesting, except for conditionally restricted areas near Logan Airport in North Boston Harbor and areas near the Neponset River and Dorchester Bay.

Dorchester Bay – This area includes waters south of the Inner Harbor that are adjacent to the study area, bounded by South Boston and Dorchester in the west and Quincy and Thompson Island to the east. This area was not included in the sampling effort done for the Boston Harbor Deep Draft Navigation project. However, MA DMF shellfish suitability maps indicate the shorelines of South Boston from Castle Island south along

Dorchester into the Neponset River estuary are nearly entirely lined with a mixture of softshell clam and blue mussel habitat.

4.0 Lobsters

Published scientific literature and results from larger scale lobster studies conducted by the MA DMF may be used to predict the distribution of lobster and their various life stages within the project area based on the substrate present. In general, lobster habitats are highly variable, dependent on life stage and time of year (Cooper and Uzmann, 1980). Inshore habitats used by populations of early benthic phase (EBP) juveniles, adolescents, and adults include mud, cobble, bedrock, peat reefs, eelgrass beds, sand, and for smaller individuals, the intertidal zone (Thomas, 1968; Cobb, 1971; Able *et al.*, 1988; Wahle and Steneck, 1991; Lawton and Robichaud, 1992; Cowan *et al.*, 2002). Young-of-the-year (YOY), which have a carapace length (CL) <15 mm, are typically restricted to shelter-providing habitats that protect them from predators (Lavalli and Barshaw, 1986; Barshaw and Lavalli, 1988; Able *et al.*, 1988; Wahle and Steneck, 1991; Wahle and Steneck, 1992). Larger juveniles may be less susceptible to inshore predators and, thus, are able to exploit a wider range of habitats, including those less likely to provide ready-made shelter and habitat that allows them to build shelters (e.g., mud) (Cobb, 1971; Berrill and Stewart, 1973; and Botero and Atema, 1982). Adolescents (sub-legal lobsters) and adults (mostly legal-sized lobsters), particularly those that remain in shallow coastal waters, have fewer predators, and are found in featureless substrates, such as sand and fine-grained mud (Cooper and Uzmann, 1980). While shelters are necessary for the purposes of molting and mating (Karnofsky, *et al.*, 1989), these larger lobsters show little shelter fidelity within a home range over a period of several days, except during over-wintering months (Goldstein and Watson, 2015). Thus, there is a trend of increased ability to exploit all available habitats, both featureless and that which provides shelter, as the size of a lobster increases.

5.0 Benthic Resources

The Massachusetts Water Resource Authority's continuing benthic studies in Boston Harbor provide valuable data on how the harbor has changed since discharge modification began in the early 2000s. As summarized by Maciolek *et al.* (2005, 2008), the major changes in discharge regimes that have occurred since 1995 were the stoppage of effluent discharge from Nut Island; the complete conversion to secondary treatment in 1998; and the diversion of all treatment discharges from the harbor to the new outfall in September 2000. Maciolek *et al.* (2008) compiled a concise summary of conditions in the Harbor since the mid-1970s. Maciolek *et al.* (2008, 2011) also documented the changes that have occurred in the harbor since the cessation of sludge discharge in 1991. The primary changes have involved stations in the northern part of the harbor, which were once considered to be heavily polluted. Changes in the northern

harbor have been dramatic; fluctuations in infaunal abundance and an increase in species numbers and diversity have been observed through 2003. Stations in the southern part of the harbor, which were less influenced by the former treatment discharges, have not shown changes in the benthos like those experienced at the northern stations. Since 1992 the improvements in benthic habitat quality led to increases in deeper, bioturbating species, which likely increased trophic complexity (Maciolek *et al.*, 2011).

Infaunal communities within Boston Harbor are clearly separable into two geographic regions. The first region overlaps the study area and is described in the main report. The second region, which is largely outside the study area, extends from east of Reserved Channel to the mouth of the harbor and includes the Lower Harbor, Main Ship Channel, and Presidents Roads Anchorage area. Infaunal abundances here (based on USACE 2003 and Massport 2003 data only) range from medium (5,000–25,000/m²) to large (25,000–80,000/m²) and species numbers range from medium (15–25/sample) to large (25–40/sample). Predominant taxa in this region include several polychaete and amphipod species. Between 1993 through 2003 amphipod tube mats occurred in all regions of Boston Harbor, declined to zero in 2004 to 2005, and have been on the rebound since, with most increases occurring from the Lower Harbor out to the Presidents Roads Anchorage area (Maciolek *et al.*, 2011).

References

- Able, KW; Heck, KL; Fahay, MP; and Roman, CT. 1988. Use of Salt-Marsh Peat Reefs by Small Juvenile Lobsters on Cape Cod, Massachusetts. *Estuaries* 11: 83-86.
- Barshaw, DE; and Lavalli, KL. 1988. Predation Upon Postlarval Lobsters (*Homarus americanus*) by Cunners (*Tautogolabrus adspersus*) and Mud Crabs (*Neopanope sayi*) on Three Different Substrates: Eelgrass, Mud, and Rocks. *Marine Ecology Progress Series* 48: 119-123.
- Berrill, M; and Stewart, R. 1973. Tunnel-Digging in Mud by Newly-Settled American Lobsters, *Homarus americanus*. *Journal of Fisheries Research Board of Canada* 30: 285-287.
- Botero, L; and Atema, J. 1982. Behavior and Substrate Selection during Larval Settling in the Lobster, *Homarus americanus*. *Journal of Crustacean Biology* 2: 59-69.
- Cobb, JS. 1971. The Shelter Related Behavior of the Lobster, *Homarus americanus*. *Ecology* 52: 108-115.
- Cooper, R; and Uzmann, J. 1980. Ecology of Juvenile and Adult *Homarus*. In: J.S. Cobb and B.F. Phillip, eds., *The Biology and Management of Lobsters*, Vol. 2, Academic Press, NY, pp. 97-142.

- Cowan, DF; Solow, AR; and Beet, A. 2002. Population Abundance and Individual Behavior of Free-ranging First-year American Lobster, *Homarus americanus*. Marine and Freshwater Research 52(8): 1095-1102.
- Cornell Lab of Ornithology. n.d. eBird. Accessed December 2025 from <https://ebird.org/home>.
- Goldstein, JS; and Watson, WH. 2015. Seasonal movements of American lobsters in southern Gulf of Maine coastal waters: patterns, environmental triggers, and implications for larval release. Marine Ecology Progress Series 524: 197-211.
- Lavalli, KL; and Barshaw, DE. 1986. Burrows Protect Postlarval Lobsters *Homarus americanus* from Predation by the Non-Burrowing Cunner *Tautogolabrus adspersus* But Not from the Burrowing Mud Crab *Neopanope texani*. Marine Ecology Progress Series 32: 13-16.
- Lawton, P; and Robichaud, DA. 1992. Lobster Habitat Ecology Research in the Bay of Fundy. In: Science Review of the Bedford Institute of Oceanography, the Halifax Fisheries Research Laboratory, and the St. Andrews Biological Station, 1990 & 91. Department of Fisheries and Oceans, Dartmouth, Nova Scotia, Canada, p. 53-56.
- Maciolek, NJ; Diaz, RJ; Dahlen, DT; Hunt, CD; and Williams, IP. 2005. 2003 Boston Harbor Benthic Monitoring Report. Boston: Massachusetts Water Resources Authority. Report ENQUAD 2005-06. 83 pages plus appendices.
- Maciolek, NJ; Diaz, RJ; Dahlen, D; and Doner, SA. 2008. Boston Harbor Benthic Monitoring Report. Boston: Massachusetts Water Recovery Authority. Report 2008-22. 54 pages plus appendices.
- Maciolek, NJ; Dahlen, D; and Diaz, RJ. 2011. Boston Harbor Benthic Monitoring Report. Boston: Massachusetts Water Recovery Authority. Report 2011-18. 20 pages plus appendix.
- Massachusetts Audubon (Mass Audubon). n.d. Monarch Butterflies. Accessed April 2023 from <https://www.massaudubon.org/learn/nature-wildlife/insects-arachnids/monarch-butterflies>.
- Massachusetts Natural Heritage and Endangered Species Program (MA NHESP). 2015a. Piping Plover *Charadrius melodus* Fact Sheet.
- MA NHESP. 2015b. Roseate Tern *Sterna dougallii* Fact Sheet.
- MA NHESP. 2019b. Whorled Milkweed *Asclepias verticillate* Fact Sheet.
- MA NHESP. 2020a. Red Knot *Calidris canutus* Fact Sheet.

- MA NHESP. 2020b. List of Endangered, Threatened, and Special Concern Species. Accessed May 2023 from <https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species>.
- Massachusetts Port Authority (Massport). 2003. Benthic Analysis of Berth Areas in Boston Harbor.
- MassGIS. 2023. MassGIS (Bureau of Geographic Information). Accessed repeatedly January-May 2023 from <https://www.mass.gov/orgs/massgis-bureau-of-geographic-information>.
- National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA-NMFS). 2022a. ESA Section 7 Mapper Version 2.1. Accessed December 2022 from <https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=a85c0313b6844e0927b5128271422a>.
- NOAA National Marine Fisheries Service (NMFS). 2023. Shortnose Sturgeon. Accessed May 2023 from <https://www.fisheries.noaa.gov/species/shortnose-sturgeon>.
- Pellegrino, P. 2003. Benthic Results for the Boston Harbor Deep Draft Project. Coastal Resource Analysts, Waterbury, CT. for U.S. Army Corps of Engineers, New England District.
- Thomas, MLH. 1968. Overwintering of American Lobsters, *Homarus americanus*, in Burrows in Biddeford River, Prince Edward Island. Journal of Fisheries Research Board of Canada 25: 2725-2727.
- U.S. Fish and Wildlife Service (USFWS). 1998. Roseate tern recovery plan, northeastern population, first update. Hadley, MA.
- USFWS. 2020. Roseate Tern Northeastern North American Population (*Sterna dougallii dougallii*) 5-Year Review: Summary and Evaluation. USFWS New England Field Office. August 2020.
- USFWS. 2024. Tricolored bat. Accessed August 2025 from <https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus>.
- Wahle, RA; and Steneck, RS. 1991. Recruitment Habitats and Nursery Grounds of the American Lobster *Homarus americanus*: A Demographic Bottleneck? Marine Ecology Progress Series 69: 231-243.
- Wahle, RA; and Steneck, RS. 1992. Habitat Restrictions in Early Benthic Life: Experiments on Habitat Selection and *in situ* Predation with the American Lobster. Journal of Experimental Marine Biology and Ecology 157: 91-114.

SPECIES LISTS FROM USFWS



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:

07/06/2026 16:54:08 UTC

Project Code: 2026-0025775

Project Name: Boston CSRM Study - East Boston

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0025775

Project Name: Boston CSRM Study - East Boston

Project Type: Flooding

Project Description: Coastal Storm Risk Management study for the City of Boston. Flood risk management measures proposed in East Boston.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.3781072,-71.02324017895742,14z>



Counties: Suffolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Roseate tern <i>Sterna dougallii dougallii</i> Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
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In Reply Refer To:
Project Code: 2026-0025718
Project Name: Boston CSRM Study - Charlestown

07/06/2026 17:20:53 UTC

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

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<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

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<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

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<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

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Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

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This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0025718

Project Name: Boston CSRM Study - Charlestown

Project Type: Flooding

Project Description: Coastal Storm Risk Management study for the City of Boston. Flood risk management measures proposed in Charlestown.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.38004095,-71.05566878774344,14z>



Counties: Suffolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

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-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Roseate tern <i>Sterna dougallii dougallii</i> Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
City: Concord
State: MA
Zip: 01742
Email: christine.sanantonio@usace.army.mil
Phone: 9783188621



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:

07/06/2026 17:10:35 UTC

Project Code: 2026-0025746

Project Name: Boston CSRM Study - Downtown

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0025746

Project Name: Boston CSRM Study - Downtown

Project Type: Flooding

Project Description: Coastal Storm Risk Management study for the City of Boston. Flood risk management measures proposed in Downtown

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.3618419,-71.04958006268909,14z>



Counties: Suffolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Roseate tern <i>Sterna dougallii dougallii</i> Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
City: Concord
State: MA
Zip: 01742
Email: christine.sanantonio@usace.army.mil
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:
Project Code: 2026-0025760
Project Name: Boston CSRM Study - South Boston

07/06/2026 17:08:29 UTC

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

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Endangered Species Act Project Review

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species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

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For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

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consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

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<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0025760

Project Name: Boston CSRM Study - South Boston

Project Type: Flooding

Project Description: Coastal Storm Risk Management study for the City of Boston. Flood risk management measures proposed in South Boston.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.339411999999996,-71.04238261737254,14z>



Counties: Suffolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Roseate tern <i>Sterna dougallii dougallii</i> Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
City: Concord
State: MA
Zip: 01742
Email: christine.sanantonio@usace.army.mil
Phone: 9783188621



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:
Project Code: 2026-0025767
Project Name: Boston CSRM Study - Dorchester

07/06/2026 16:58:27 UTC

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

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Endangered Species Act Project Review

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Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

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<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0025767

Project Name: Boston CSRM Study - Dorchester

Project Type: Flooding

Project Description: Coastal Storm Risk Management study for the City of Boston. Flood risk management measures proposed in Dorchester.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.3046104,-71.04726669427589,14z>



Counties: Suffolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Roseate tern <i>Sterna dougallii dougallii</i> Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
City: Concord
State: MA
Zip: 01742
Email: christine.sanantonio@usace.army.mil
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 3301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:
Project Code: 2026-0089370
Project Name: Boston CSRM Study

05/15/2026 13:00:58 UTC

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

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For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 3301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0089370

Project Name: Boston CSRM Study

Project Type: Flooding

Project Description: These are the first proposed measures to be implemented as part of the Boston Coastal Storm Risk Management Study. In South Boston, USACE proposes to add one-foot parapet walls to the existing walls at the I-90 tunnel entrance and implement a closure structure at the State Police on-ramp. In Moakley Park, USACE proposes a floodwall behind William J Day Blvd and a berm/levee extending through the park.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.34682915,-71.03849725521347,14z>



Counties: Suffolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Roseate Tern <i>Sterna dougallii dougallii</i> Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
City: Concord
State: MA
Zip: 01742
Email: christine.sanantonio@usace.army.mil
Phone: 9783188621



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 3301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:
Project code: 2026-0089370
Project Name: Boston CSRM Study

05/14/2026 16:53:49 UTC

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Record of project representative's no effect determination for 'Boston CSRM Study'

Dear Christine San Antonio:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on May 14, 2026, for 'Boston CSRM Study' (here forward, Project). This project has been assigned Project Code 2026-0089370 and all future correspondence should clearly reference this number. **Please carefully review this letter.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the **Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey)**, invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat and/or Tricolored Bat

Based upon your IPaC submission and a standing analysis, your project has reached the following effect determinations:

Species	Listing Status	Determination
Tricolored Bat (<i>Perimyotis subflavus</i>)	Proposed	No effect
	Endangered	

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17).

Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no consultation with the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13].

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Roseate Tern *Sterna dougallii dougallii* Endangered

You may coordinate with our Office to determine whether the Action may affect the animal species listed above and, if so, how they may be affected.

Next Steps

If there are no updates on listed species, no further consultation/coordination for this project is required with respect to the species covered by this key. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions

occurs, additional coordination with the Service should take place to ensure compliance with the Act.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference Project Code 2026-0089370 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Boston CSRM Study

2. Description

The following description was provided for the project 'Boston CSRM Study':

These are the first proposed measures to be implemented as part of the Boston Coastal Storm Risk Management Study. In South Boston, USACE proposes to add one-foot parapet walls to the existing walls at the I-90 tunnel entrance and implement a closure structure at the State Police on-ramp. In Moakley Park, USACE proposes a floodwall behind William J Day Blvd and a berm/levee extending through the park.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.34682915,-71.03849725521347,14z>



DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the species covered by this determination key. Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for those species.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

Automatically answered

No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

Automatically answered

No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Note for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer 'yes' to this question.

Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

Yes

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum or winter roost? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

Automatically answered

No

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

No

12. Does the action area contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs?

No

13. Is the action located in New England (CT, MA, ME, NH, RI, or VT)?

Yes

14. Is the action located in one of the counties in New England where bridge assessments are recommended by either the New England or Maine Ecological Services Field Office in their [Bridge and Culvert Survey Letter](#)?

No

15. Will the action cause effects to a covered bridge, a bridge with wood or timber as a component of the construction or a bridge with stone or masonry as a component of the construction? Note: see the New England and Maine Ecological Services [Bridge and Culvert Survey Letter](#) for more information.

No

16. Is the action in one of the New England counties where culvert assessments are recommended by either the New England or Maine Ecological Services Field Office in their [Bridge and Culvert Survey Letter](#)?

No

17. Will the action cause effects to any "cave-like" culvert(s) - a culvert that is long enough (likely greater than 200 feet long) that it remains dark in the middle during daylight hours and maintains relatively stable temperatures. Note: see the New England and Maine Ecological Services [Bridge and Culvert Survey Letter](#) for more information.

No

18. Are trees present within 1000 feet of the action area? **Note:** If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in the USFWS' [Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines](#).

Yes

19. Does the action include the intentional exclusion of bats from a building or building-like structure? **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

No

20. Does the action involve removal, modification, or maintenance of a human-made building-like structure (barn, house, or other building) **known or suspected to contain roosting bats?**

No

21. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

22. Will the action include or cause any construction or other activity that is reasonably certain to increase average night-time traffic permanently or temporarily on one or more existing roads? **Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

23. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

24. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

Note: For information regarding NSF/ANSI 60 please visit <https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects>

No

25. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

26. Will the action include drilling or blasting?

No

27. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use at night)?

No

28. Will the proposed action involve the use of herbicides or pesticides (e.g., fungicides, insecticides, or rodenticides)?

No

29. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season? Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining. **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in the USFWS' [Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines](#).

No

30. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable forested northern long-eared bat or tricolored bat roosting habitat? **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in the USFWS' [Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines](#).

No

31. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

Yes

32. Is the project related to the production of coal, including projects that support the mining of coal, as well as the production and/or distribution of energy produced from coal?

No

33. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

No

34. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

No

35. Does the project intersect with the 0- 9.9% forest density category?

Automatically answered

Yes

36. Does the project intersect with the 10.0- 19.9% forest density category map?

Automatically answered

No

37. Does the project intersect with the 20.0- 29.9% forest density category map?

Automatically answered

No

38. Does the project intersect with the 30.0- 100% forest density category map?

Automatically answered

No

39. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 0.5 acre in total extent?

No

40. Will the proposed action result in the use of prescribed fire?

Note: If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

No

41. Does the action area intersect the tricolored bat species list area?

Automatically answered

Yes

42. Is the action area located within 0.5-mile of radius of an entrance/opening to any known tricolored bat hibernacula or winter roost?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

Automatically answered

No

43. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

44. Has a presence/probable absence bat survey targeting the [tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#) been conducted within the project area?

No

45. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities? (If unsure, answer ""Yes."" **Note:** If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see the [Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines](#).

No

46. Do you have any documents that you want to include with this submission?

No

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

0.5

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Christine San Antonio
Address: 696 Virginia Road
City: Concord
State: MA
Zip: 01742
Email: christine.sanantonio@usace.army.mil
Phone: 9783188621



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 3301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:
Project code: 2026-0089370
Project Name: Boston CSRM Study

05/15/2026 12:58:48 UTC

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'Boston CSRM Study'

Dear Christine San Antonio:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on May 15, 2026, for "Boston CSRM Study" (here forward, Project). This project has been assigned Project Code 2026-0089370 and all future correspondence should clearly reference this number.

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northeast Determination Key (DKey), invalidates this letter. **Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.**

To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative effect(s)), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17). Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no further consultation with, or concurrence from, the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical

habitat, formal consultation is required (except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13]).

The IPaC results indicated the following species is (are) potentially present in your project area and, based on your responses to the Service's Northeast DKey, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Roseate Tern (<i>Sterna dougallii dougallii</i>)	Endangered	No effect

Conclusion

If there are no updates on listed species, no further consultation/coordination for this project is required for the species identified above.

However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project implements any changes which are final or commits additional resources.

Other Species and Critical Habitat that May be Present in the Action Area

In addition to the species listed above, the following species and/or critical habitats may also occur in your project area and are not covered by this conclusion:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

To complete consultation for species that have reached a "May Affect" determination and/or species may occur in your project area and are not covered by this conclusion, please visit the "New England Field Office Endangered Species Project Review and Consultation" website for step-by-step instructions on how to consider effects on these listed species and/or critical habitats, avoid and minimize potential adverse effects, and prepare and submit a project review package if necessary: <https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

Please Note: If the Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) by the prospective permittee may be required. Please contact the Migratory Birds Permit Office, (413) 253-8643, or PermitsR5MB@fws.gov, with any questions regarding potential impacts to Eagles.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference the Project Code associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Boston CSRM Study

2. Description

The following description was provided for the project 'Boston CSRM Study':

These are the first proposed measures to be implemented as part of the Boston Coastal Storm Risk Management Study. In South Boston, USACE proposes to add one-foot parapet walls to the existing walls at the I-90 tunnel entrance and implement a closure structure at the State Police on-ramp. In Moakley Park, USACE proposes a floodwall behind William J Day Blvd and a berm/levee extending through the park.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.34682915,-71.03849725521347,14z>



QUALIFICATION INTERVIEW

1. As a representative of this project, do you agree that all items submitted represent the complete scope of the project details and you will answer questions truthfully?

Yes

2. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed species?

Note: This question could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered, or proposed species.

No

3. Is the action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Note: for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer 'yes' to this question.

Yes

4. Are you including in this analysis all impacts to federally listed species that may result from the entirety of the project (not just the activities under federal jurisdiction)?

Note: If there are project activities that will impact listed species that are considered to be outside of the jurisdiction of the federal action agency submitting this key, contact your local Ecological Services Field Office to determine whether it is appropriate to use this key. If your Ecological Services Field Office agrees that impacts to listed species that are outside the federal action agency's jurisdiction will be addressed through a separate process, you can answer yes to this question and continue through the key.

Yes

5. Are you the lead federal action agency or designated non-federal representative requesting concurrence on behalf of the lead Federal Action Agency?

Yes

6. Is the lead federal action agency the Natural Resources Conservation Service?

No

7. Will the proposed project involve the use or storage of herbicide?

No

8. Will the proposed project involve herbaceous native vegetation removal (including prescribed fire that would result in burning of plants) or mowing?

No

9. Does any component of the project associated with this action include activities or structures that may pose a collision risk to **birds** (e.g., plane-based surveys, land-based or offshore wind turbines, new or enlarged communication towers or broadcast towers, high voltage transmission lines, any type of towers with or without guy wires)?

No

10. Will the proposed project involve demolition, rehabilitation, property elevation, renovation, and/or rebuilding of one or more existing buildings (e.g., residential, commercial and industrial buildings, or utilities)? Note: if project activities include modification of bridges and/or culverts, answer this question "No".

No

11. Does the project area intersect the boundary of VAFO?

Automatically answered

No

12. Is the project being funded, lead, or managed in whole or in part by U.S Fish and Wildlife Restoration and Recovery Program (e.g., Partners, Coastal, Fisheries, Wildlife and Sport Fish Restoration, Refuges)?

No

13. Will the proposed project result in changes to beach dynamics that may modify formation of habitat over time? **Note:** Examples of projects that result in changes to beach dynamics include 1) construction of offshore breakwaters, bulkheads, revetments, and groins; 2) mining of sand from an updrift ebb tidal delta; 3) removing or adding beach sands; and 4) projects that stabilize dunes (including placement of sand fences or planting vegetation).

No

14. Will the proposed project involve dredging within 0.5 mile of the Mean Lower Low Water line?

No

15. Will the proposed project involve oil, gas and other energy development, production, or large-scale transport or storage of petroleum products and/or spill response planning?

No

16. [Hidden Semantic] Is the project area located within the roseate tern species list area?

Automatically answered

Yes

17. Does the project include aquaculture?

No

18. Does the project include activity in or within 500 feet of an open beach, coastal inlet, river mouth, sand spit, tidal flat, or rocky structure (e.g., jetty) or open water where roseate terns may be feeding?

Yes

19. Does the project intersect the 1 mile area around roseate tern nesting and/or staging colonies?

Automatically answered

No

20. Is this a coastal project that has an action area that is less than one-half acre?

Note: These projects may include marker buoys, moorings, navigational structures, docks, piers, floats, boat ramps, private dredging, boat houses, lobster pound, or shoreline work.

No

21. Will project activities be conducted during the time of year when roseate terns are likely to be present?

Note: roseate terns are likely to be present in Maine May 1 through Sept. 1; and in Connecticut, Massachusetts, New Hampshire, and Rhode Island April 15 through Oct. 15.

Yes

22. Will the proposed project affect suitable habitat for roseate terns nesting (barrier islands with dense vegetation or rocks to serve as shelter)?

No

23. Will the proposed project affect suitable habitat for roseate terns foraging (nearshore shallow waters, shoals and shoals in offshore waters)?

No

24. Will the proposed project affect suitable habitat for roseate terns roosting (rocky habitat on coastal islands)?

No

25. Will the proposed project affect suitable habitat for roseate terns staging (sandy barrier beaches, often on distal tips, primarily in NY and NE)?

No

26. Will the proposed project involve ground disturbance (e.g., vehicles, tracked equipment, excavating, grading, placing fill material, etc.) in roseate tern foraging, nesting, roosting or staging habitat while terns are likely to be present (April 1 - September 30)?

No

27. Does the action area include suitable habitat for migrating roseate terns (sandy beaches, coastal islands)?

No

28. Does the project area intersect the Birdwing Pearlymussel species list area?

Automatically answered

No

29. Does the project area intersect the Dromedary Pearlymussel species list area?

Automatically answered

No

30. Does the project area intersect the Finerayed Pigtoe species list area?

Automatically answered

No

31. Does the project area intersect the Slabside Pearlymussel species list area?

Automatically answered

No

32. Do you have any other documents that you want to include with this submission?

No

PROJECT QUESTIONNAIRE

1. Approximately how many acres of trees would the proposed project remove?
0.5
2. Approximately how many total acres of disturbance are within the disturbance/
construction limits of the proposed project?
9.5
3. Briefly describe the habitat within the construction/disturbance limits of the project site.
existing urban infrastructure, roads, open park space with grass and few trees

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MITIGATION ESTIMATES

Boston CSRM - Mitigation cost estimate via ILF for permanent loss of marine habitat

Estimated area to be mitigated		Notes	
	sq ft		
East Boston	9483	For all neighborhoods - any fill being placed in existing piles fields was included in the tally, but not the piles themselves as that seems to be more of a 1:1 replacement	
Charlestown	71967		
Downtown	662988		
South Boston	159700		
Dorchester	66427	Included the in-water levee at columbia point	
TOTAL	970565		
2026 MA ILF fee per credit tidal:		\$822,670	Assuming this is per acre as prior fee in 2016 was \$782,876/acre (\$17.44/sq ft)
2026 price per sq ft:		\$18.89	
Mitigation \$	\$18,333,973	~\$18.3M	
2016 fee	\$16,926,654		

EAST BOSTON

Alignment	Floodwall	Levee		Existing Open Water		Existing Piles	
		Land	Water	Fill	Piles	Fill	Piles
Waterfront West to Atlantic Works	124,815	-	-	-	-	-	-
Atlantic Works to Lopresti (Perimeter)	49,052	-	-	-	-	-	-
Border St Cutoff	20,406	-	-	-	-	-	-
Lopresti to Piers Park	60,644	-	-	-	-	9,483	6,720
Marginal St Road Raising	-	4,521	-	-	-	-	-
Porzio Park/Tomahawk Drive	21,609	25,982	-	-	-	-	-
East Boston Greenway/Wood Island Park	-	48,912	-	-	-	-	-
Constitution Beach	81,129	22,081	-	-	-	-	-
Orient Heights Railyard	112,862	-	-	-	-	-	-
Chelsea Creek (Perimeter)	91,611	-	-	-	-	-	-
Chelsea Creek (Route 1A)	49,060	-	-	-	-	-	-

Includes wall features, plus additional fill under existing pile-supported roadway

Intent is for this to be all upland wall and limit/eliminate disturbance to marsh

Totals	Sq. Ft.	Acres
Total On Land	712,684	16.36
Total In Water	16,203	0.37

Typical Fill Width Behind Outboard Sheetpile	4
Typical Pile Footprint Beyond Outboard Sheetpile	12 Assumes 30' water depth
Typical Floodwall Footprint	30 Used where surface data was spotty/inconsistent

Perimeter Classification (Existing)

Stations	Length (ft)	Type
55+00 to 66+70	1170	Upland
71+20 to 78+00	680	Upland
78+00 to 83+60	560	Piles

CHARLESTOWN

Alignment	Floodwall	Levee	Existing Open Water		Existing Piles	
			Fill	Piles	Fill	Piles
Ryan Playground	2,777	7,383	-	-	-	-
Schrafft's	63,076	-	-	-	-	-
Navy Yard	62,267	-	10,022	24,900	17,797	20,100
Chelsea St	21,396	-	-	-	-	-
Little Mystic	19,727	-	4,812	14,436	-	-

Totals	Sq. Ft.	Acres
Total On Land	176,626	4.05
Total In Water	92,067	2.11

Typical Fill Width Behind Outboard Sheetpile 4
Typical Pile Footprint Beyond Outboard Sheetpile 12 *Assumes 30' water depth*

DOWNTOWN

Alignment	Floodwall	Levee	Existing Open Water		Existing Piles	
			Fill	Piles	Fill	Piles
Perimeter	9,000	13,276	118,888	155,040	356,791	-
Interior	123,119	-	-	-	-	-
Lovejoy Wharf	1,280	-	-	5,220	27,049	-
Commercial St	10,349	3,643	-	-	-	-
Paul Revere Park	-	5,896	-	-	-	-

Assumes all new wall is outboard, not in place of exisitng harborwalks. Levee = elevating parking lot

"Levee" is technically a road raising
"Levee" is technically a road raising

Totals	Sq. Ft.	Acres
Total On Land	166,563	3.82
Total In Water	662,988	15.22

Typical Fill Width Behind Outboard Sheetpile	4
Typical Pile Footprint Beyond Outboard Sheetpile	12 Assumes 30' water depth

Larger Fill Areas	Piles	Open Water	Total
Battery Wharf	122,742	-	122,742
Lewis Wharf	12,713	6,366	19,079
Commercial Wharf	68,980	-	68,980
Long Wharf	-	16,217	16,217
Aquarium	52,967	11,159	64,126
Harbor Towers/Rowes Wharf	99,389	33,466	132,855
Outboard Perimeter Length	12,920		

SOUTH BOSTON

Alignment	Floodwall	Levee		Existing Open Water		Existing Piles	
		Land	Water	Fill	Piles	Fill	Piles
Fan Pier to Seaport Blvd	-	-	-	11,900	35,700	7,100	21,300
Seaport Blvd to D Street	11,903	-	-	-	-	-	-
D Street	20,464	29,362	-	-	-	-	-
Marine Park Perimeter & Black Falcon	334,500	-	-	-	-	-	-
Pappas Way	81,608	-	-	-	-	-	-
Summer St & Haul Road	33,927	24,545	-	-	-	-	-
Fort Point Channel Surge Barrier	-	-	-	105,000	-	-	-
Parapet Wall							

Approximated, does not account for existing impacts from current Northern Ave Bridge remains
Adding on to an existing wall, what do we need to include?

Totals	Sq. Ft.	Acres
Total On Land	536,309	12.31
Total In Water	181,000	4.16

Typical Fill Width Behind Outboard Sheetpile	4
Typical Pile Footprint Beyond Outboard Sheetpile	12 Assumes 30' water depth
Typical Floodwall Footprint	30 Used where surface data was spotty/inconsistent

Perimeter Classification (Existing)

Stations	Length (ft)	Type
0 to 14+75	1475	Open Water
14+75 to 27+50	1275	Piles
27+50 to 42+50	1500	Open Water
42+50 to End	500	Piles

DORCHESTER

Alignment	Floodwall	Levee		Existing Open Water		Existing Piles	
		Land	Water	Fill	Piles	Fill	Piles
Harbor Point	19,408	190,929	60,187	-	-	-	-
Pattens Cove	15,701	90,082	-	-	-	-	-
Morrissey Blvd	33,531	-	-	-	-	-	-
Victory Road	-	1,333	-	-	-	-	-
Tenean Beach	6,986	56,069	-	-	-	-	-
Neponset Creek	9,903	33,340	-	1,560	4,680	-	-

Totals	Sq. Ft.	Acres
Total On Land	457,282	10.50
Total In Water	66,427	1.52

Typical Fill Width Behind Outboard Sheetpile 4

Typical Pile Footprint Beyond Outboard Sheetpile 12 Assumes 30' water depth

INTERTIDAL AND SUBTIDAL HABITAT SURVEYS

Boston Harbor Coastal Storm Risk Management Feasibility study Boston, MA



DATA REPORT
HABITAT CHARACTERIZATION SURVEY
IN SUPPORT OF PROJECT DESIGN

**BOSTON HARBOR COASTAL STORM RISK
MANAGEMENT FEASIBILITY STUDY**

BOSTON, MA

December 2024

Prepared by:

Planning Division
Marine Operations Program
US Army Corps of Engineers
New England District
Concord, Massachusetts

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APPENDICES

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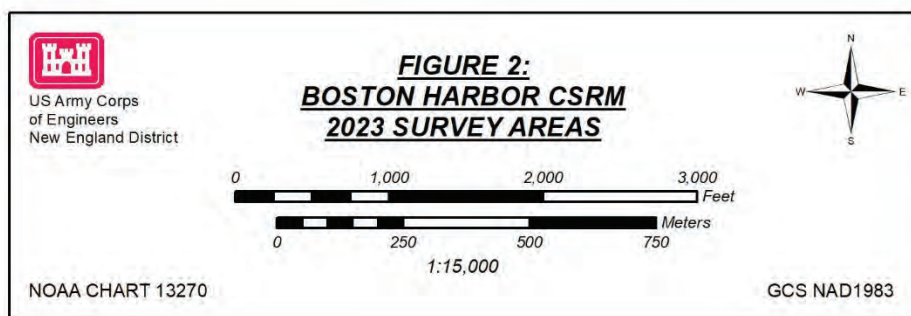
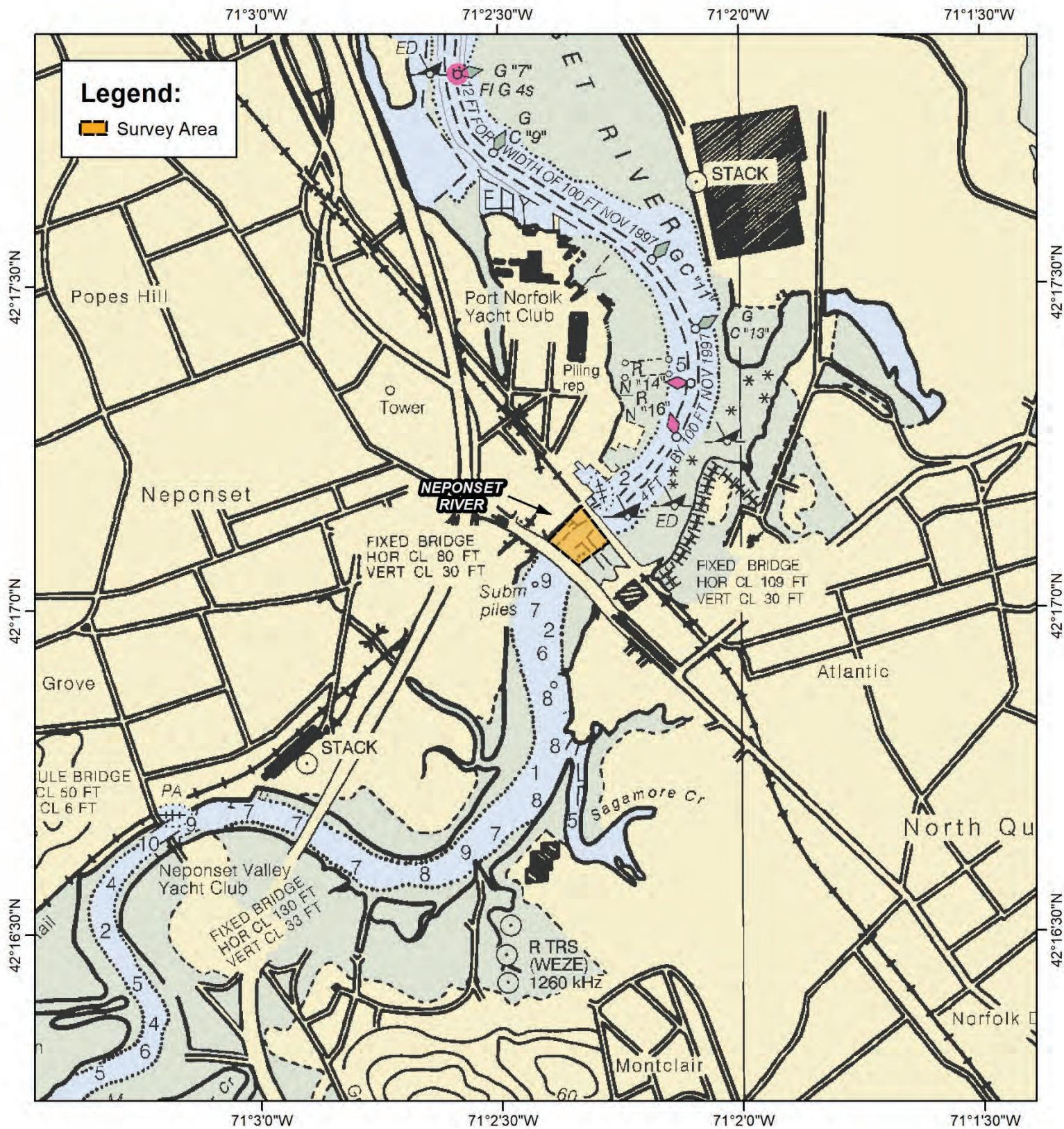
1.0 INTRODUCTION

The New England District (NAE) of the US Army Corps of Engineers (USACE) and the City of Boston have partnered to undertake a Coastal Storm Risk Management (CSRM) feasibility study for the Boston Harbor area. This study is being conducted under the authority of a Senate Committee on Public Works Resolution dated September 12, 1969, which authorizes an investigation of options for reducing flood risk along the coastline of Massachusetts. It is prepared as a partial response to the study authority, investigating only a segment of the Massachusetts shoreline within the municipal boundary of the city of Boston, Massachusetts.

Boston has become increasingly vulnerable to coastal storms, with flood levels and flood damages in highly developed urban areas along the coast increasing in intensity and frequency in recent years. With expected future sea level change, the vulnerability of the city of Boston to coastal flooding and storm damages will likely continue to increase. The city recognized the risk prior to 2018, starting the Climate Ready Boston initiative, which focused on identifying the coastal community risks, potential timing of the risks, as well as a full range of potential alternatives to manage the risks. The city submitted a letter to USACE in 2020 requesting support and an investigation to address medium and long-term risks associated with coastal storms. The primary objective of the CSRM study is to identify a plan to reduce the risk of coastal storm related damages to neighborhoods within the city of Boston.

General alternatives under consideration in the feasibility study include: a plan to defend all adjacent neighborhoods through construction of in-water perimeter structures and surge barriers (this will have the greatest environmental impact but a lower impact on waterfront real estate and continuity of function for abutters), a plan to defend all adjacent neighborhoods with non-structural measures (this option maximizes building adaptations to eligible structures and decreases in-water construction work, but will have greater impacts to local businesses during construction and future storm events), and a combination of individual neighborhood alternatives including structural (floodwalls, berms, surge barriers), non-structural (elevate/adapt buildings), and natural and nature based features (creating greenspace, living levees, beach nourishment).

This report describes field efforts performed by NAE in August and October of 2023 to document the bathymetry, distribution of surficial sediment types, and presence of aquatic resources of concern that might be impacted by construction activities within the intertidal and subtidal portions of seven investigation areas (Figures 1-2) under consideration in the CSRM Feasibility study. Efforts taken to meet these objectives included a combined bathymetric and high-resolution side scan sonar survey, photo documentation of conditions in the exposed intertidal portion of each investigation area, and collection of underwater imagery using either a drop camera system or remotely operated underwater vehicle (ROV). The resulting data products will be used to evaluate specific project alternatives as they are identified by the NAE CSRM project delivery team. The sections below discuss the field collection and data processing methods employed, site conditions encountered, and the results of analysis in support of the stated project objectives.



2.0 MATERIALS AND METHODS

2.1 Hydroacoustic Surveys and Shoreline Photographic Documentation

Data Collection

Hydroacoustic survey activities were conducted in August of 2023 by staff from the NAE Environmental Resources and Marine Programs Section. The purpose of this effort was to collect bathymetry and high-resolution side scan sonar imagery to facilitate a detailed analysis of the seabed in the vicinity of the seven proposed project areas. Specifically, interpretation of these data sets enabled NAE to evaluate the seafloor topography in the area, map the distribution of surficial sediment types, and identify any aquatic resources of concern that might be impacted by the potential construction activities. Additionally, photographs of exposed intertidal habitat and waterfront structures were collected during each survey to document the shoreline conditions within each investigation area and identify habitats present.

The survey transects for each project area were pre-planned in Hypack® survey software and transferred to the survey vessel's computer for navigation in the field. These transects were laid out to provide overlapping coverage of the seafloor within the survey boundaries depicted in Figures 1 and 2. The extent and orientation of these transects were determined by water depths and features identified on Nautical Charts 13270 and 13272, produced by the National Oceanic and Atmospheric Administration (NOAA).

All work was carried out onboard the *R/V Nomad*, a 25-foot SBI Defender outfitted for coastal sampling and survey operations. Vessel positioning was achieved using a SBG Systems Navsight Ekinox inertial navigation system. Real-time kinematic (RTK) corrections from the HxGN SmartNet network were accessed and applied to all position data during the survey through a cellular internet connection. Hydroacoustic data was collected using an Edgetech 6205 multi-phase echosounder with a 230 kHz bathymetry frequency and a 230/550 kHz side-scan sonar configuration. The sonar head was fixed to an adjustable survey boom mounted along the starboard side of the vessel. The face of the sonar head was adjusted to a depth of 3.3 feet below the water surface in order to maximize the usable swath on the port data channel without interference from the vessel hull. Prior to the start of each survey effort a patch test was conducted to correct for pitch, roll, and yaw deviations resulting from sensor misalignment and to account for the latency of the system. Conductivity, temperature, and depth (CTD) profiles were collected throughout the surveys using a Sontek Castaway®-CTD and were uploaded to Hypack® to correct for speed of sound variations in the water column.

The bathymetric and side-scan sonar data streams were viewed in real time on the survey vessel and recorded in Hypack®. Waypoints were created in Hypack® throughout the survey to mark changes in bottom type and features of interest to be investigated during data processing. The vessel operator navigated all transects at a speed of approximately 5 knots or less while recording data. Transects were run in opposite directions to minimize non-recording time. Transect information including the number, filename, start and stop time, direction, and any pertinent observations were recorded in a field log throughout each survey and were used as a reference during data processing.

Bathymetric Data Processing

Bathymetric data from the 230 kHz channel of each transect was processed in Hypack® MBMax. The raw soundings were filtered to flag erroneous sonar returns (i.e. inaccurate bottom depth outputs resulting from acoustic artifacts, noise in the water column, or vegetation). All data was manually reviewed for accuracy, and spurious points were removed by an experienced sonar technician. Tide corrections were made in Hypack® by applying local tide model offsets from the NOAA Vertical Datum Transformation (VDatum) tool to the RTK orthometric heights recorded in the field. The finalized data set for the survey area was exported from Hypack® MBMax as an .xyz file with averaged soundings using a 3x3 foot grid spacing and depths referenced to Mean Lower Low Water (MLLW). These files were then used in ESRI ArcMap 10.8 to generate depth contours and create a triangular irregular network (TIN) model of the seafloor within each project area. The bathymetric model for each survey footprint is presented by project area in sections 3.1 through 3.8 of this report.

Side-Scan Sonar Data Processing

Side scan sonar creates an image of the seafloor by measuring the travel time and intensity of reflected acoustic energy, referred to as backscatter. The reflected signal strength is very sensitive to subtle variations in seafloor hardness and texture. Materials such as rock and sand are very efficient at reflecting acoustic energy and have a high backscatter signature while fine sediments such as silt and clay absorb more energy than they reflect and therefore exhibit low backscatter. Because of these characteristics it is possible to interpret changes in backscatter as a proxy for grain size and generate a map of surficial geology. It is also possible to distinguish the size and shape of seafloor features by examining the pattern of their acoustic reflection and shadow.

Side-scan sonar data from the 550 kHz channel of each survey transect was imported to Chesapeake Technology (CTI) SonarWiz 7 software for processing and analysis. Processing included digitizing of the first signal return to remove the water column portion of the sonar record, and adjustment of signal amplitude by range and angle using Empirical Gain Normalization (EGN). The processed transects were combined into high-resolution mosaics and used to interpret the surficial sediment type and identify features of interest within each project area. The side scan sonar mosaic for each survey footprint is presented by project area in in sections 3.1 through 3.8.

Shoreline Imagery Processing

The shoreline photo documentation collected during each survey was compiled and stored in an electronic database containing associated location information along with a brief description of the image content (including substrate type, structure descriptions, and observations of biota). The shoreline image database for all project areas is presented in Appendix A.

2.2 Underwater Video Surveys

Data Collection

Underwater video survey activities were performed by NAE during October of 2023. The purpose of this effort was to collect information to verify the interpretation of August 2023 side scan sonar data, and to document the benthic habitat within each project area. To meet this objective, representative points were selected from the side scan sonar mosaics for each project area and transferred to Hypack® for navigation in the field. A drop camera system incorporating plan and profile view cameras into a custom built frame with a fixed quadrat and lighting was used to collect video imagery from project area stations within Boston Harbor (Figure 1). This work was carried out onboard the *R/V Nomad* using the same positioning equipment employed during the hydroacoustic surveys. Video footage from the Neponset River project area (Figure 2) was collected using a Video Ray Pro 4 ROV deployed from multiple points along the northwestern shoreline to collect video transects across the survey footprint.

Underwater Imagery Processing

Plan and profile-view video files from each drop camera video station or transect in Boston Harbor, and each ROV video transect in the Neponset River were reviewed using CyberLink PowerDirector video editing software. Representative screen captures were created from the video footage collected at each station or transect. These screen captures were stored in an electronic database containing associated station information, along with a brief description of the video content (including substrate type, bedforms, and other habitat features). The video survey image database is presented by investigation area in Appendix B.

3.0 RESULTS

3.1 South Boston Waterfront

The survey footprint in South Boston covered the waterfront from the mouth of the Fort Point Channel to the Raymond L. Flynn Marine Park (a.k.a. the South Boston Naval Annex Historic District), and an area from the entrance of the Boston Ship Repair Dry Dock #3 to the western end of the Reserved Channel by the Summer Street Bridge. A total of 47 transects covering 11.3 linear miles within a 133.7 acre investigation area were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 647,421 processed bathymetric soundings (Figure 3). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 150-foot swath (75 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 4), features observed in the bathymetric model of the investigation area, and underwater video survey data (Figure 5, Table 1, and Appendix B) also demonstrated excellent agreement. Tidal stage and excellent water clarity during the hydroacoustic survey enabled the field crew to make visual observations of shallow

submerged structure and intertidal habitat along the waterfront. Photographic documentation supporting shoreline characterization within this investigation area is presented in Appendix A.

Shoreline Characterization

The shoreline along the waterfront from the Fort Point Channel to the Marine Park is dominated by earthen-filled and piling-supported pier structures projecting into the harbor with narrow basins situated between them. From west to east, these include the Fan Pier, Pier 4, Commonwealth Pier (a.k.a. World Trade Center Pier), the Boston Fish Pier, and Dry Dock #4. The waterfront inshore of the piers runs along Seaport Boulevard and Northern Avenue, and generally consists of stone seawalls and sheet pile bulkheads. Numerous drainage outfalls discharging to the waterway from these features. The piers themselves are a complex of seawalls and sheet pile bulkheads (Fan Pier and Fish Pier), concrete piling-support platforms (Commonwealth Pier), and concrete bulkheads (Dry Dock #4). These structures supported algae, macroalgae, barnacles, and patches of mussels. Many public and private docks, businesses, and various attractions (e.g., the Institute of Contemporary Art, Leaderbank Pavilion, and Boston Harbor Cruises) are situated along the waterfront in this location. The surrounding area consists of a heavily developed urban cityscape.

The shoreline along the adjacent footprint of the Raymond L. Flynn Marine Park consists of riprap seawall to the west, a concrete piling-supported wharf with concrete loading platforms to the east, and a riprap seawall along the seaward face. The waterfront to the south of the Marine Park includes Dry Dock 3 (a former US Navy facility and one of the largest dry docks on the Eastern Seaboard), Flynn Cruiseport Boston (the main port terminal for cruise ships visiting the city of Boston), and the Coastal Cement Corporation facility. The shoreline in the vicinity of the Dry Dock 3 Approach Channel consists of a concrete piling-supported wharf with loading platforms along the southern side of the Marine Park, a concrete gravity wall with piling-supported loading platforms along the northern side of the Cruiseport terminal, and short stretches of seawall adjacent to the dry dock gate. The shoreline along the Reserved Channel consists of a concrete gravity wall with piling-supported loading platforms. The density of adjacent industrial facilities combined with the extensive system of loading platforms and shipping terminals in the area make this portion of the waterfront a primary port facility for some of the largest ships entering Boston Harbor.

Hydroacoustic Data Interpretation

Tide corrected depths within the investigation area ranged from 0 to -55 feet MLLW. The bathymetric profile between the mouth of the Fort Point Channel and the Raymond L. Flynn Marine Park was dominated by man-made berths, generally ranging from -20 to -30 feet deep with the exception of those surrounding the Commonwealth Pier, which reached approximately -40 feet. Shallower areas, typically -10 to -20 feet deep, were documented off the face of the Fan Pier, in the vicinity of the private docks between the Fan Pier and Pier 4, and in the ruins of historic pier structures extending out from the shoreline between the Fish Pier and Dry Dock 4. The seabed along the northern face of the Raymond L. Flynn Marine Park dropped steeply to ambient depths ranging from -20 to -30 feet, with dredge cuts in excess of -40 feet in the vicinity of the Massachusetts Turnpike Tunnel and adjacent to the concrete piling-supported wharf to the east. Depths within the Dry Dock 3 Approach Channel were approximately -40 feet, shoaling to -30 feet within the adjacent berth to the south and along the seaward and southern faces of the

Cruiseport terminal. The seabed to the south of the Cruiseport dropped steeply from -30 feet into the -40 and -35 foot sections of the Reserved Channel, with recent dredge cuts in isolated portions of each area reaching -50 and -40 feet, respectively. The surveyed footprint above the head of the Reserved Channel shoaled more gradually before becoming intertidal in the vicinity of the Summer Street Bridge.

Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and pier structures throughout the investigation area, transitioning to ambient soft sediments. Evidence of recent anthropogenic interaction with the seabed were observed in the form of keel drag marks within the berthing areas, depressions and areas of apparent propeller scour within the private boat docks between the Fan Pier and Pier 4, and clusters of individual dredge bucket impressions within the Reserved Channel. The subsurface portion of shoreline features including sheet pile bulkheads, support pilings, anchoring features, and the toe of riprap seawalls were all discernable and well documented in the survey data set. Other features of interest within the investigation area included an assemblage of derelict pilings and debris in the footprint of historic pier structures between the Fish Pier and Dry Dock #4, a small sunken barge or float (measuring approximately 20 feet by 10 feet) adjacent to the Fan Pier, and isolated pockets of coarse material or debris on otherwise uniform portions of the ambient silty seabed.

Benthic Habitat Characterization

Underwater imagery documented two primary types of benthic habitat along the South Boston Waterfront between the Fort Point Channel and the Raymond L. Flynn Marine Park. Within the basins and seaward of the piers, benthic habitat generally consisted of silt with infaunal invertebrate tubes and burrows (65% of video stations). Adjacent to the seawalls, piers, and other shoreline structures, the underwater video survey documented patches of shell reef habitat primarily composed of live mussel (*Mytilidae* spp.) and mussel shell. These areas (SB-2, SB-5, SB-6, and SB-13) also supported slipper snails (*Crepidula* spp.), barnacles (*Balanidae* spp.), macroalgae, and tunicates (likely *Molgulidae* sp. or *Asciidiella aspersa*). A patch of cobble and gravel habitat with isolated small boulders was documented 150 feet off the historic Pier 2 (now the eastern end of Fan Pier) and supported a sparse cover of ectoprocts and hydroids (SB-11). Video station SB-3 was located within the ruins of historic Navy Pier 7, next to Dry Dock 4, and was characterized by silt mixed with anthropogenic debris including wood fragments and pieces of rope. A sunken barge was identified at SB-14, located in front of the federal courthouse on Fan Pier. The barge supported ectoprocts (*Bugula* sp.), hydroids, solitary tunicates (*Styela clava*), encrusting tunicates (*Didemnum* sp.), and encrusting sponges (*Halichondria panicea*).

Benthic habitat within the Dry Dock #3 Approach Channel and the Reserved Channel was bare silt with infaunal invertebrate tubes and burrows (SB-16 and SB-21). The shallow area to the west of the Reserved Channel was characterized by silty sand with shell hash and infaunal invertebrate tubes and burrows (SB-15). Underwater video stations located adjacent to the concrete gravity wall along the Cruiseport Terminal documented a mix of silt with infaunal invertebrate tubes and burrows (SB-17 and SB-20) and patches of cobble habitat with little-to-no attaching flora or fauna (SB-18 and SB-19). The underwater video survey of the seafloor along the northern face of the Raymond L. Flynn Marine Park was performed in conjunction with the survey of the Boston Harbor Surge Barrier investigation area, and is discussed in detail within section 3.2 of this report.



40 FOOT, RESERVED
CHANNEL

35 FOOT, RESERVED
CHANNEL

35 FOOT NORTH
CHANNEL

FLYNN CRUISEPORT TERMINAL

DOLPHIN WAY

FID KENNEDY AVENUE

DRY DOCK #4

TIDE STREET

SWORDFISH WAY

CODFISH WAY

SHELLFISH WAY

SEAFOOD WAY

SHORELINE ROAD

DRY DOCK #3

BOSTON FISH PIER

COMMONWEALTH PIER

PIER 4

EDMUND A. NEILLON

MASSPORT HAUL ROAD

HARBOR STREET

TIDE STREET

BLACK FALCON AVE

WORLD TRADE CENTER ROAD

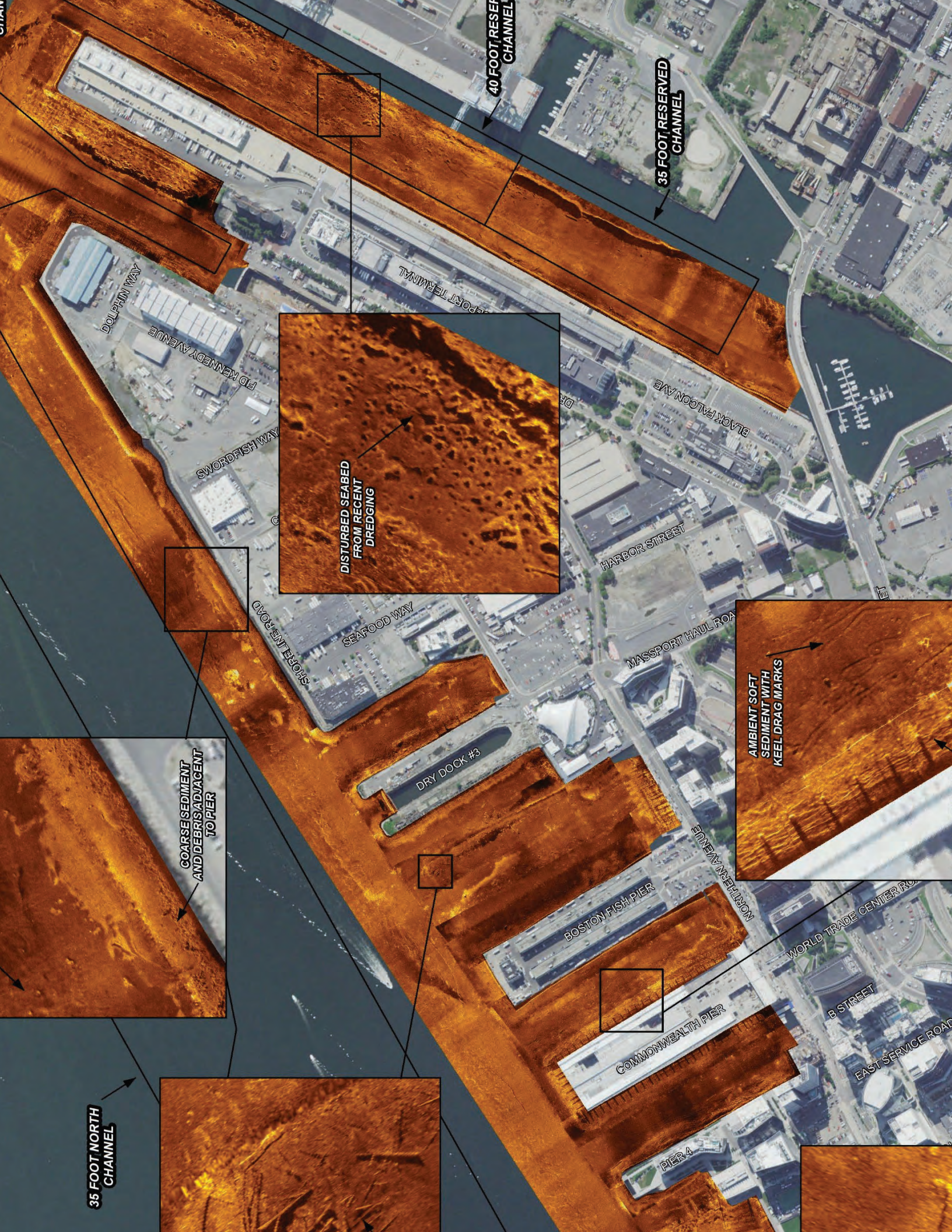
B STREET

EAST SERVICE ROAD

LESTER STREET

D STREET

BOSTON



40 FOOT, RESERVED
CHANNEL

35 FOOT, RESERVED
CHANNEL

DISTURBED SEABED
FROM RECENT
DREDGING

AMBIENT SOFT
SEDIMENT WITH
KEEL DRAG MARKS

COARSE SEDIMENT
AND DEBRIS ADJACENT
TO PIER

35 FOOT NORTH
CHANNEL

DOLPHIN WAY

FID KENNEDY AVENUE

SWORDFISH WAY

SEAFOOD WAY

HARBOR STREET

MASSPORT HAUL ROAD

EDMUND ARNOLD

BOSTON FISH PIER

COMMONWEALTH PIER

PIER 4

WORLD TRADE CENTER ROAD

B STREET

EAST SERVICE ROAD

DRY DOCK #3



40 FOOT, RESERVED
CHANNEL

35 FOOT, RESERVED
CHANNEL

35 FOOT NORTH
CHANNEL

SB19

SB18

SB17

SB16

SB15

SB21

SB22

SB20

MSC13

MSC14

MSC12

MSC7

MSC16

MSC6

MSC17

MSC15

MSC5

SB2

SB3

SB4

SB5

SB7

SB6

SB8

SB10

SB9

DOLPHIN WAY

FID KENNEDY AVENUE

SWORDFISH WAY

CODFISH WAY

SHELLFISH WAY

SEAFOOD WAY

OWEN ENTERPRISES

DRY DOCK #3

DRY DOCK #4

TIDE STREET

DRYDOCK AVENUE

BLACK FALCON AVE

HARBOR STREET

MASSPORT HAUL ROAD

LESTER STREET

D STREET

EDMUND ARNOLDSON

WORLD TRADE CENTER ROAD

B STREET

EAST SERVICE ROAD

PIER 4

COMMONWEALTH PIER

BOSTON FISH PIER

TABLE 1: SOUTH BOSTON WATERFRONT – UNDERWATER VIDEO SURVEY STATIONS

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
SB1	42.349831	-71.033158	-28.3	Silt	Bare silt with small infaunal invertebrate tubes and burrows
SB2	42.351144	-71.034120	-24.5	Mussel Shell	Mussel reef with epiphytic slipper snails and barnacles
SB3	42.351245	-71.035258	-25.2	Debris	Historic pier location - Silt and shell rubble with rope, wood, and metallic debris
SB4	42.350706	-71.036957	-22.4	Silt	Bare silt with a thin layer of microbial algae
SB5	42.348652	-71.037288	-13.0	Sand/Gravel/Shell	Shell rubble with anthropogenic debris and attached filamentous macroalgae
SB6	42.352345	-71.037725	-24.6	Sand/Gravel/Shell	Sand and shell rubble with a dense cover of tunicates and a sparse cover of ectoprocts and hydroid
SB7	42.350716	-71.039607	-33.3	Silt	Bare silt with infaunal invertebrate tubes and burrows
SB8	42.353340	-71.038951	-35.1	Silt	Bare silt with infaunal invertebrate tubes, burrows, and castings
SB9	42.352435	-71.040702	-35.5	Silt	Bare silt with infaunal invertebrate tubes and burrows.
SB10	42.353332	-71.040628	-37.4	Silt	Silt with infaunal invertebrate tubes, burrows, castings, and sparse tunicates
SB11	42.355165	-71.043774	-23.4	Sand/Shell/Gravel/Cobble	Sand, gravel, cobble, and shell hash with an isolated boulder in the center of the quadrat
SB12	42.355459	-71.044644	-24.0	Silt	Bare silt with infaunal invertebrate tubes, burrows, and castings
SB13	42.355243	-71.045759	-16.2	Silt/Shell	Silt with shell rubble and attached kelp
SB14	42.355409	-71.046470	-21.1	Debris	Sunken barge with attached ectoprocts, hydroids, and mixed macroalgae
SB15	42.342188	-71.035435	-7.5	Silt/Sand/Shell	Silty sand with shell hash/rubble
SB16	42.342757	-71.034740	-36.4	Silt	Bare silt with infaunal invertebrate tubes and burrows
SB17	42.343299	-71.031417	-38.5	Silt	Silt with infaunal invertebrate tubes and burrows
SB18	42.343336	-71.029401	-40.3	Gravel/Cobble	Gravel and cobbles with trace shell rubble
SB19	42.343415	-71.026280	-38.5	Silt/Gravel/Cobble	Silt with gravel and cobbles and trace anthropogenic debris
SB20	42.343800	-71.021748	-38.7	Silt	Mostly bare silt with infaunal invertebrate tubes and burrows
SB21	42.345240	-71.024321	-41.2	Silt	Bare silt with infaunal invertebrate tubes and burrows
SB22	42.346222	-71.023109	-27.3	Shell Reef	Mussel shell reef

3.2 Boston Harbor Surge Barrier

The survey footprint for the Surge Barrier component of the CSRM feasibility study covered an area of Boston Harbor between Logan Airport in East Boston and the Raymond L. Flynn Marine Park in South Boston, including General Anchorage 1 (a.k.a. Bird Island Anchorage), and portions of the Boston Harbor Federal Navigation Project's (FNP) 35-foot North Channel and 40-foot Main Ship Channel. A total of 19 transects covering 9.2 linear miles within a 158.3 acre investigation area footprint were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 765,897 processed bathymetric soundings (Figure 7). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 300-foot swath (150 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 7), features observed in the bathymetric model of the investigation area, and underwater video survey data (Figure 8, Table 2, and Appendix B) also demonstrated excellent agreement. Frequent large ship wakes and poor water clarity prevented the field crew from making direct visual observations of submerged structure and intertidal habitat from the water surface. Photographic documentation of exposed shoreline structure within this investigation area is presented in Appendix A.

Shoreline Characterization

The shoreline along Logan Airport consists of a long stretch of riprap seawall, the lower portions of which are covered in algae, macroalgae, barnacles, and patches of mussels. Massport Outfall 002 (West Outfall) is located at the western end of the seawall, and discharges stormwater to the harbor. The adjacent area upland area includes an airport maintenance road, paved runway sections. As described in section 3.1, the shoreline along the footprint of the Raymond L. Flynn Marine Park consists of riprap seawall to the west and concrete piling-supported wharf with concrete loading platforms to the east.

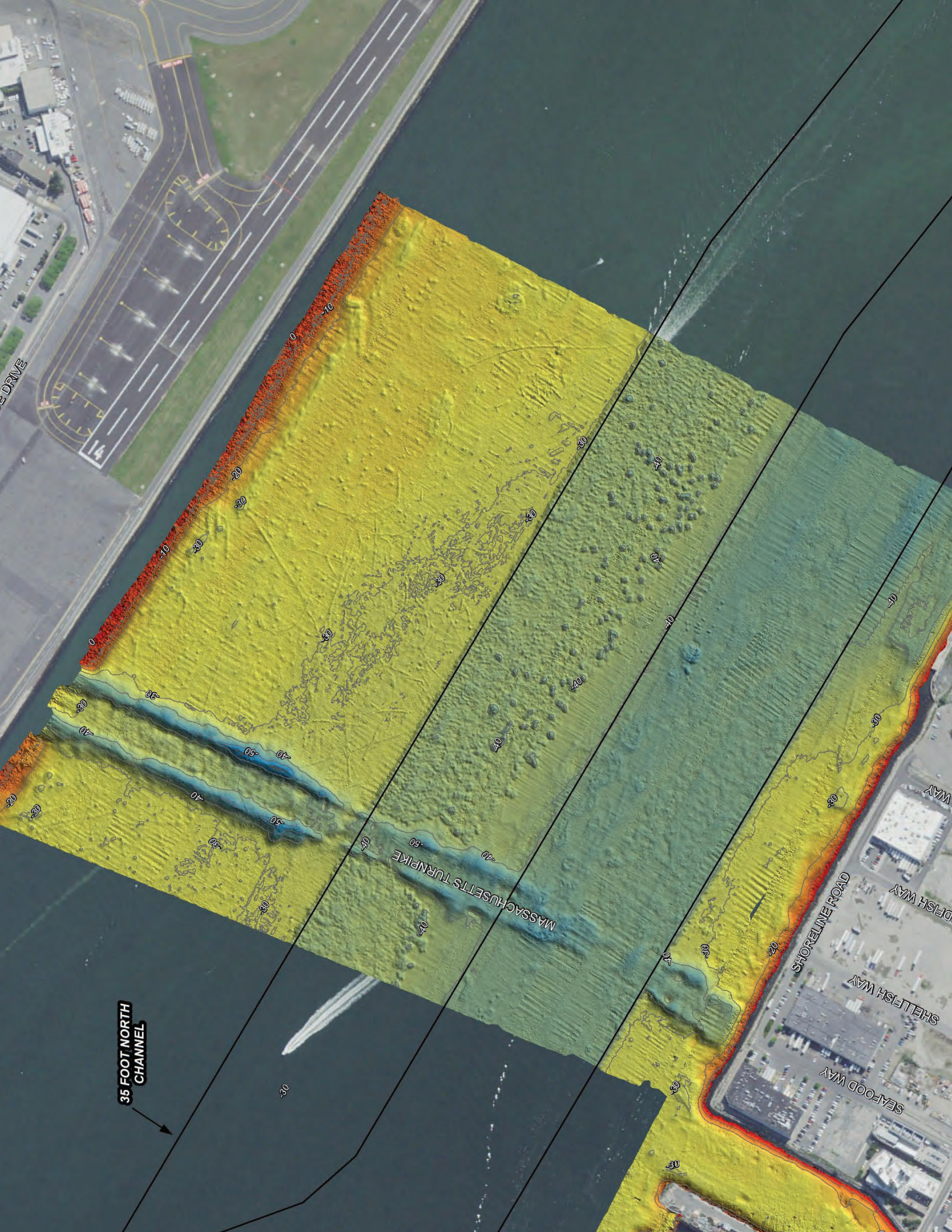
Hydroacoustic Data Interpretation

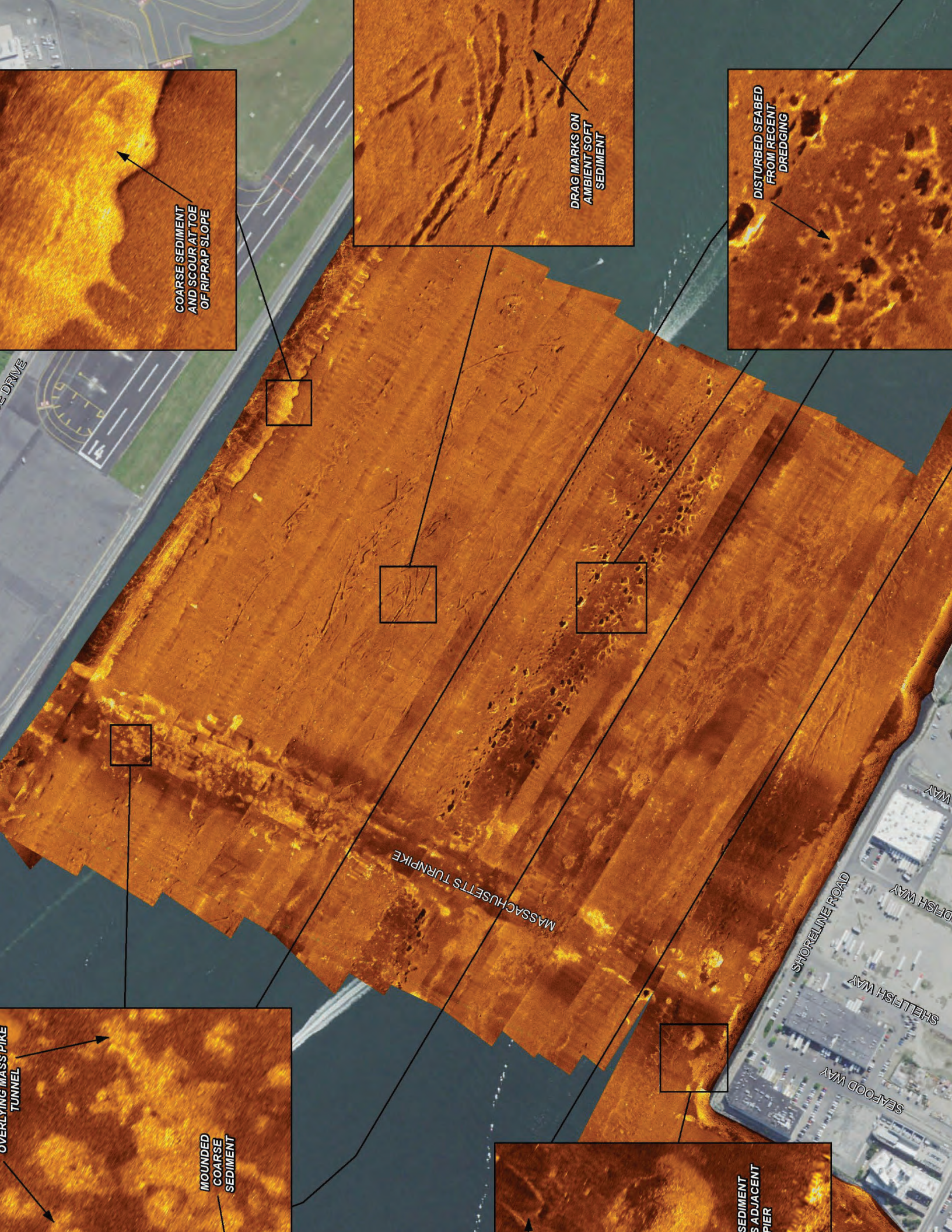
Tide corrected depths within the investigation area ranged from 0 to -55 feet MLLW. The riprap seawall along the East Boston waterfront sloped down to ambient depths of -20 to -30 feet within General Anchorage 1, then dropped sharply into the 35-foot North Channel, followed by the adjacent 40-foot Main Ship Channel to the south. Ambient depths adjacent to the riprap seawall along the Raymond L. Flynn Marine Park ranged from -20 to -30 feet before dropping sharply into the 40-foot Main Ship Channel. The seabed along the concrete piling-supported wharf to the east dropped steeply to a dredge cut in excess of -40 feet, extending into the Main Ship Channel. The western portion of the investigation area was bisected by the remnant of the trench dredged during construction of the Massachusetts Turnpike Tunnel. The profile of this trench was elevated along the tunnel structure with depressions along either side, at times reaching depths in excess of -50 feet.

Interpretation of side scan sonar data documented an area of coarse sediment and scour along the toe of the riprap slope adjacent to Logan Airport. The seabed immediately adjacent to the riprap seawall and wharf structure on the South Boston shoreline was composed of coarse sediment and debris. Both areas transitioned abruptly to ambient soft sediments, which comprised the majority of the substrate within the investigation area. Numerous drag marks, seabed impressions, and targets isolated corresponding debris were documented in the anchorage area. A pattern of dredge bucket impressions and areas of disturbed seabed from recent channel maintenance activities were visible throughout the northern two thirds of the 35-foot North Channel and within isolated areas of the 40-foot Main Ship Channel. Areas of coarse material corresponding to armor stone were observed in and along portions of the trench for the Massachusetts Turnpike Tunnel, particularly within the footprint of General Anchorage 1. Additionally, several isolated mounds of coarse sediment were observed along either side of the trench, adjacent to the South Boston waterfront.

Benthic Habitat Characterization

Benthic habitat within the surge barrier investigation footprint was predominantly silt with infaunal invertebrate tubes and burrows (>75% of video stations). The seafloor within the FNP was entirely bare silt with the exception of video station MSC-12, which contained silt mixed with gravel and shell. Rock crabs (*Cancer* sp.) were present at this location. Video station MSC-1 (located north of the 35-foot North Channel) was situated on top of Massachusetts Turnpike tunnel and documented an area of armor stone composed of large cobbles and small boulders with attached ectoprocts (*Bugula* sp.), hydroids, encrusting sponges (*Halichondria panicea*), and slipper snails (*Crepidula fornicata*). The substrate along either shoreline was generally coarser than the silt found throughout the central portion of the survey area. Video station MSC-14, located adjacent to the Flynn Marine Park, documented silt with a dense cover of non-living mussel (*Mytilidae* spp.) shells with attached bushy ectoprocts and rock crabs. Video station MSC-15, located approximately 75 feet off the South Boston shoreline in 11 feet of water, documented a gravel and shell reef with a sparse cover of ectoprocts and hydroids. Approximately 180 feet off the South Boston shoreline, on the western edge of the Turnpike Tunnel, MSC-17 documented a mix of sand and gravel with a dense cover of shell hash. Along the East Boston shoreline, the substrate consisted of silty sand with gravel and shell (MSC-3) adjacent to the to the seawall, and transitioned to silt with a layer of microbial algae and many invertebrate tubes, burrows, and casting piles further off the shoreline (MSC-11).





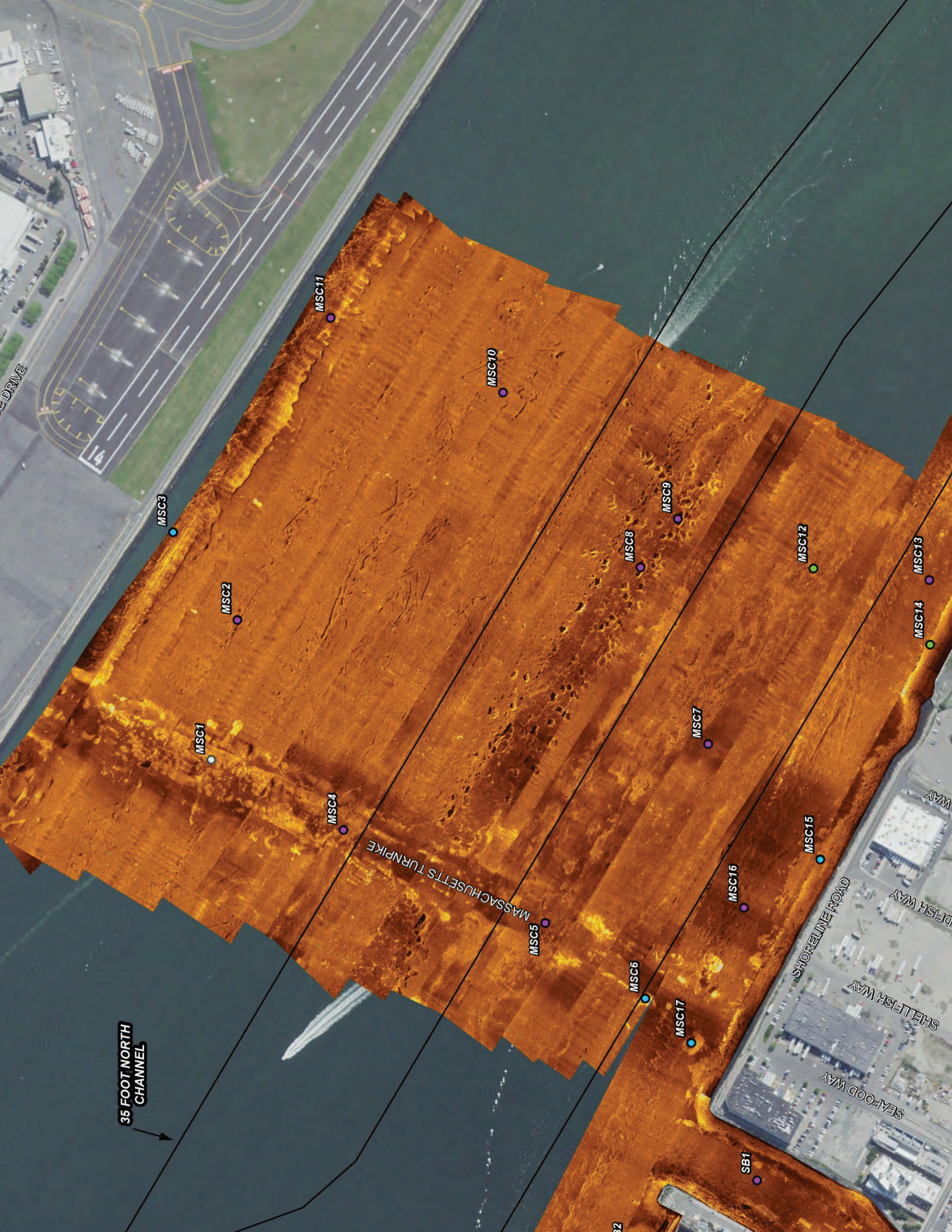


TABLE 2: BOSTON HARBOR SURGE BARRIER – UNDERWATER VIDEO SURVEY STATIONS

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
MSC1	42.355373	-71.027333	-36.5	Cobble/Boulder	Cobbles and boulders with attached ectoprocts, hydroids, encrusting sponges, and slipper snails
MSC2	42.355100	-71.025412	-30.4	Silt	Bare silt with small infaunal invertebrate tubes and burrows
MSC3	42.355750	-71.024199	-6.3	Sand/Gravel/Shell	Silty sand with gravel and shell hash/rubble, mixed macroalgae attached to hard substrate, spider crab present within quadrat
MSC4	42.354030	-71.028310	-38.3	Silt	Silt with infaunal invertebrate castings, trace shell hash/rubble
MSC5	42.351979	-71.029603	-45.2	Silt	Silt with infaunal invertebrate tubes and burrows, trace shell hash and gravel
MSC6	42.350961	-71.030649	-37.7	Sand/Gravel/Shell	Silty sand with gravel and shell hash/rubble
MSC7	42.350306	-71.027155	-42.6	Silt	Bare silt with small infaunal invertebrate tubes and burrows
MSC8	42.350985	-71.024721	-38.2	Silt	Bare silt with small infaunal invertebrate tubes and burrows
MSC9	42.350602	-71.024051	-39.6	Silt	Bare silt with small infaunal invertebrate tubes and burrows
MSC10	42.352380	-71.022302	-28.0	Silt	Bare silt with small infaunal invertebrate tubes and burrows
MSC11	42.354132	-71.021260	-15.8	Silt	Silt with a thin layer of microbial algae and many infaunal invertebrate castings
MSC12	42.349222	-71.024749	-44.0	Silt/Gravel/Shell	Silt with moderate to dense gravel and shell hash/rubble, crab present within quadrat
MSC13	42.348040	-71.024915	-42.6	Silt	Bare silt with small infaunal invertebrate tubes and burrows
MSC14	42.348037	-71.025802	-32.9	Silt/Shell	Silt with dense mussel shell rubble, trace bushy ectoprocta attached to shell substrate Crab present within quadrat
MSC15	42.349168	-71.028750	-11.0	Sand/Gravel/Shell	Gravel and shell reef, sparse ectoprocts and hydroids attached to hard substrate
MSC16	42.349950	-71.029409	-29.8	Silt	Bare silt with small infaunal invertebrate tubes and burrows.
MSC17	42.350495	-71.031262	-28.0	Sand/Gravel/Shell	Sand and gravel with shell hash

3.3 Fort Point Channel

The survey footprint in the Fort Point Channel component of the CSRM Feasibility study covered the entire waterway from the Old Northern Avenue Bridge to the head of the channel between the Gillette World Shaving Headquarters and the Dorchester Avenue Bridge. A total of 7 transects covering 3.9 linear miles within a 42.5 acre investigation area were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 172,942 processed bathymetric soundings (Figure 9). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 150-foot swath (75 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 10), features observed in the bathymetric model of the investigation area, and underwater video survey data (Figure 11, Table 3, and Appendix B) also demonstrated excellent agreement. Tidal stage and excellent water clarity during the hydroacoustic survey enabled the field crew to make observations of shallow submerged structure and intertidal habitat along the waterfront. Photographic documentation supporting shoreline characterization within this investigation area is presented in Appendix A.

Shoreline Characterization

The shoreline along the Fort Point Channel consists of stone seawalls, sheet pile bulkheads, piling-supported wharves, and concrete loading platforms. The shoreline structures supported algae, macroalgae, and barnacles. Multiple drainage outfalls and combined sewer overflows (CSOs) discharge to the waterway from these structures. Additionally, a large cooling water intake structure for the adjacent Gillette facility is present on eastern side of the channel, seaward of the company's outfalls.

The derelict Old Northern Avenue Bridge, Evelyn Moakley Bridge (Seaport Boulevard), Congress Street Bridge, and Summer Street Bridge (listed from north to south) all span the channel. The Boston Tea Party Museum and docks for the 18th Century sailing vessels *Beaver* and *Eleanor* are situated in the middle of the channel, connected to the Congress Street Bridge structure. Several private docks extend into the channel from either shoreline. An art installation titled "Floating Pyramid" resides in the center of the channel, just south of the Summer Street Bridge. The surrounding area consists of a heavily developed urban cityscape and industrial facilities.

Hydroacoustic Data Interpretation

The entirety of Fort Point Channel is subtidal with the exception of rock piles along the base of the stone seawall at head of the waterway. Tide corrected depths within the investigation area ranged from +4 to -30 feet MLLW. Ambient depths within the investigation area were generally -20 to -25 feet, shoaling to -10 or -5 feet along the shoreline and in the vicinity of waterway structures. Deeper channelized areas reaching almost -30 feet were present through the fendered/central openings of the Summer, Congress and Moakley Bridges, through the eastern opening of the Old Northern Avenue Bridge, and in a small basin along the eastern shoreline in the vicinity

of the Gillette cooling water intake structure. The concrete structures of the Massachusetts Bay Transportation Authority (MBTA) Silver Line tunnel to the north and the Massachusetts Turnpike tunnel to the south were both apparent within the bathymetric profile of the area. The Turnpike tunnel was the most notable of these structures, running diagonally across the channel and elevated 10 feet above the ambient seabed. The Silver Line tunnel was narrower and lower, elevated approximately 3 feet above the surrounding bottom. The seabed along the western edge of the channel below the Congress Street Bridge was entirely subtidal, but too shallow to safely navigate or effectively record soundings during the field effort. However, it should be noted that the swath of usable side scan sonar data from the Edgetech 6205 is greater than that of the bathymetric data stream, which allowed the field crew to record high quality side scan imagery throughout all portions of the investigation area footprint.

Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and along anthropogenic structures within the waterway, transitioning to ambient soft sediments interrupted by numerous targets corresponding to debris and isolated piles of mounded coarse material. The subsurface portion of structures including sheet pile bulkheads, support pilings, bridge piers, and fendering systems were discernable and well documented in the side scan sonar imagery. The ruins of historic waterfront structures were apparent along both the eastern and western shorelines. The hard margins of the Silver Line and Massachusetts Turnpike tunnel structures were well defined within the data set, along with adjacent and overlying areas of coarse material corresponding to ballast stone, particularly along either side of the Turnpike Tunnel. Other features of interest within the investigation area included a sunken barge (measuring roughly 30 feet by 15 feet) and adjacent debris field to the south of the Summer Street Bridge, a wing wall structure and corrugated metal pipeline adjacent to the Gillette cooling water intake structure on the eastern shoreline, and a high density of isolated coarse sediment mounds adjacent to a submerged sheet pile retaining wall on the western shoreline.

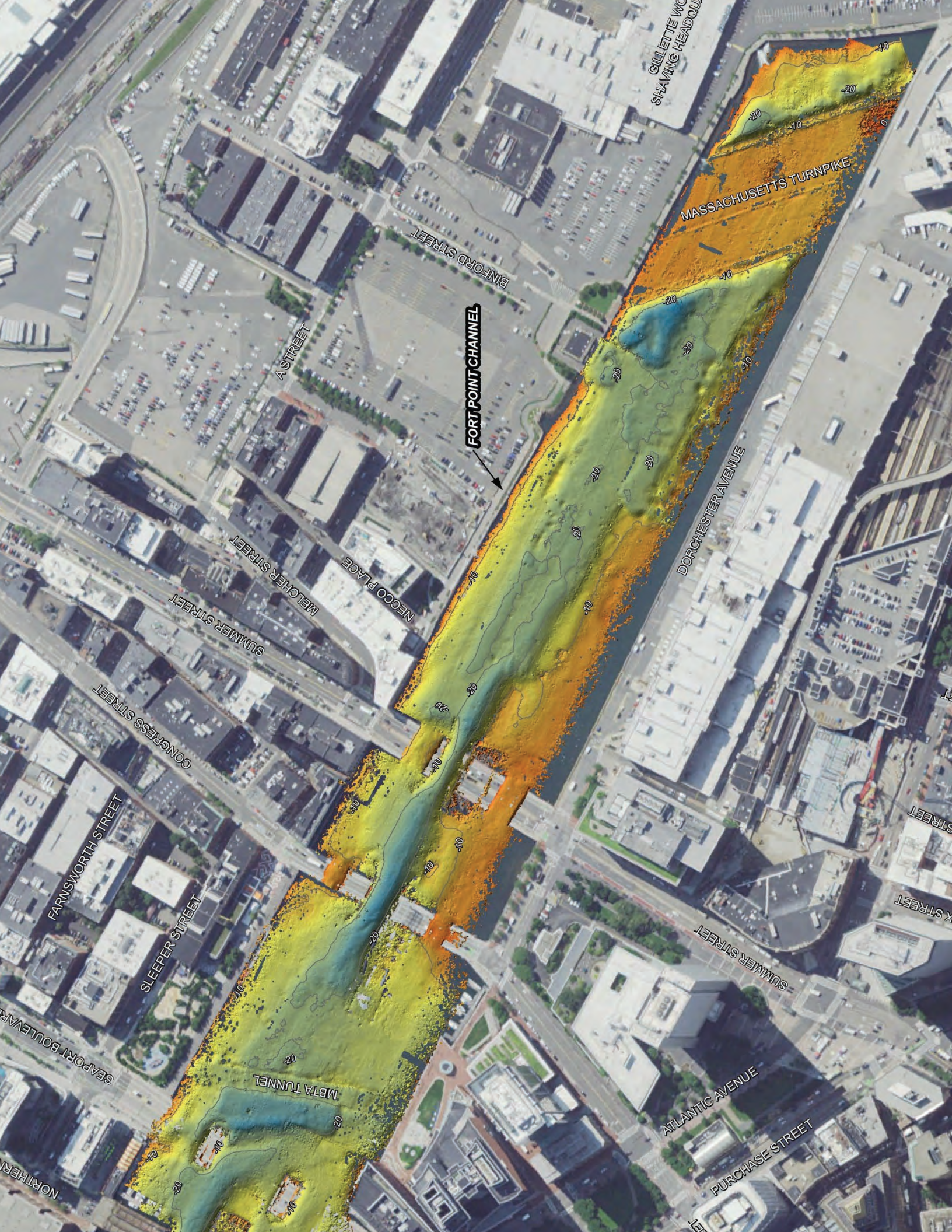
Benthic Habitat Characterization

The ambient benthic habitat within the Fort Point Channel was primarily silt (roughly 80% of video stations) with little-to-no infaunal invertebrate bioturbation evident. The presence of either a veneer of microbial algae and/or a layer of filamentous macroalgae covering the seafloor at over 85% of video stations indicated that eutrophic conditions may have been present during the survey. The lack of infaunal invertebrate activity observed during the underwater video survey may have been a result of **hypoxic benthic conditions** caused by decomposition of the algal biomass present within the channel. Gravel habitat was observed at underwater video stations FP-5, FP-8, FP-9, and FP-12. The substrate present at FP-8 and FP-9 appeared to be crushed stone used to support or protect submerged anthropogenic structures.

Benthic habitat within the channel was also characterized by a high degree of anthropogenic structure and debris (present at roughly 65% of video stations), ranging from trash and construction debris to the ruins of historic docks and piers. The seafloor at station FP-13 was littered with debris including derelict metal pipe sections and what appeared to be piles of bunched-up heavy fabric. Video transect FP-6 documented a sunken metal barge, which hosted sponges, tunicates, ectoprocts, and hydroids. Submerged sheet pile sections, wooden pilings and corrugated metal

pipings observed during video transect FP-11 were associated with the Gillette cold water intake structure, though it was not possible to tell if they were active or derelict features.

The underwater video survey also documented features associated with the MBTA and Massachusetts Turnpike tunnels. The underwater video transect at FP-3 documented a sheet pile bulkhead along the southern edge of the MBTA tunnel. The top of the tunnel was covered with tunicates (likely Molgulidae sp., *Styela clava*, or *Ascidella aspersa*), which are typically found attached to hard substrate. Video transect FP-9 clearly showed the scoured edges of the I-90 concrete tunnel structure elevated above the silt seafloor. The top of the tunnel was covered in a thick layer of filamentous macroalgae with patches of what appeared to be crushed ballast stone. This stone was also present along either side of the tunnel structure.



GILLETTE WAY
SHAVING HEADWAY

MASSACHUSETTS TURNPIKE

BINFORD STREET

FORT POINT CHANNEL

ASTOR STREET

MELCHER STREET

SUMMER STREET

CONGRESS STREET

FARNSWORTH STREET

SLEEPER STREET

SEAPORT BOULEVARD

NORTHERN AVENUE

MBTA TUNNEL

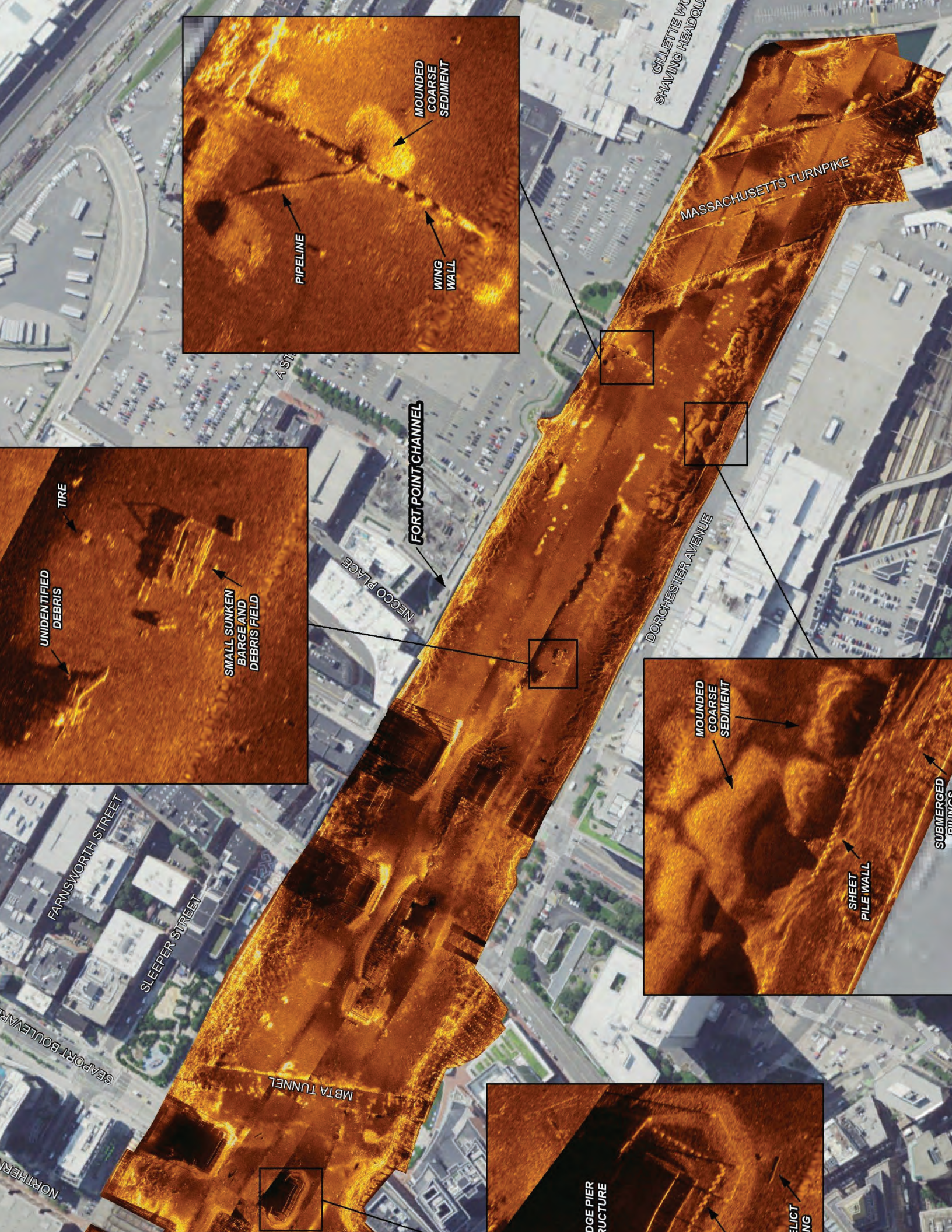
ATLANTIC AVENUE

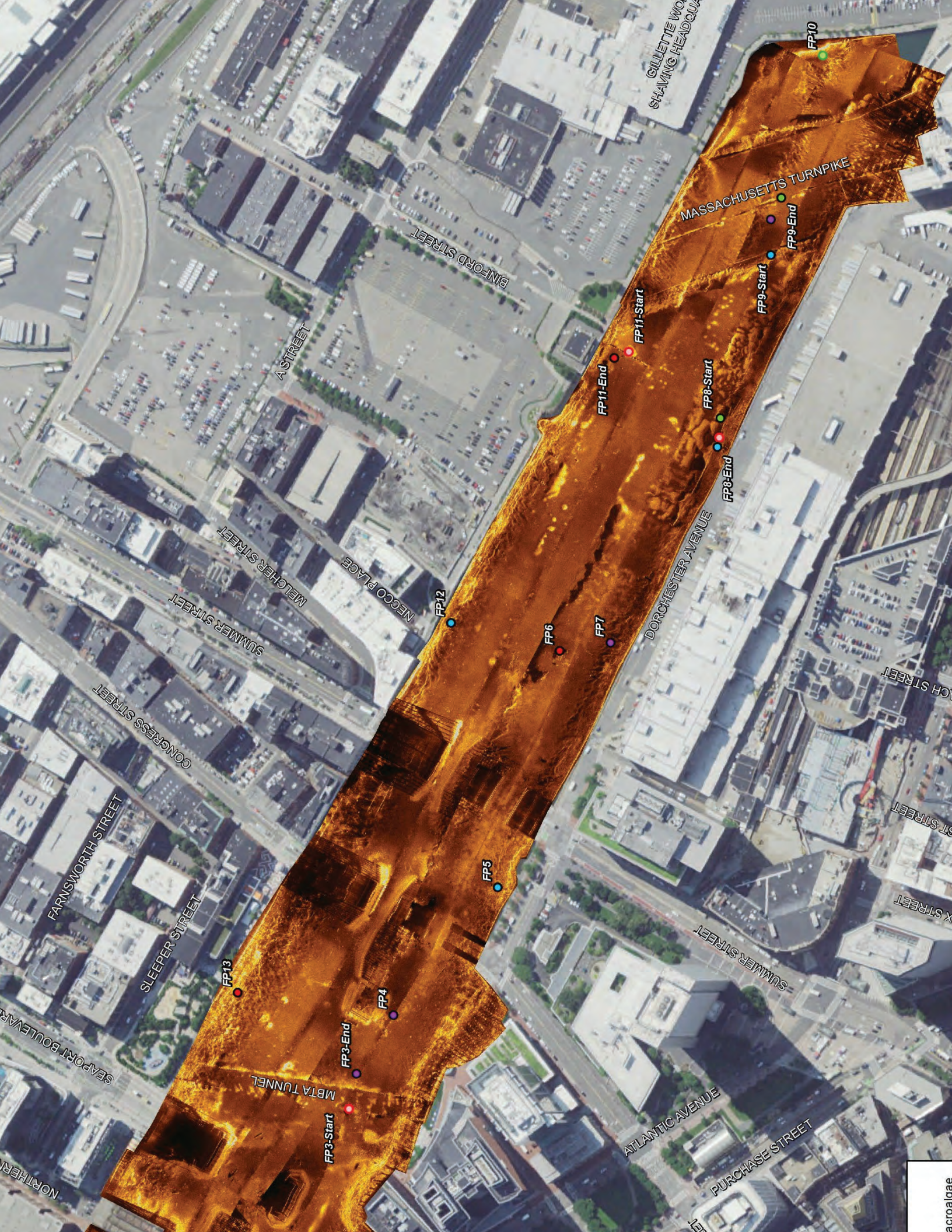
PURCHASE STREET

SUMMER STREET

STREET

STREET





NORTHERN

SEAPORT BOULEVARD

FARNSWORTH STREET

CONGRESS STREET

SLEEPER STREET

SUMMER STREET

MELCHER STREET

ASTOR STREET

BINFORD STREET

NECCO PLACE

ATLANTIC AVENUE

PURCHASE STREET

DORCHESTER AVENUE

MASSACHUSETTS TURNPIKE

GILLETTE WOOL
SHAVING HEADQUARTERS

croaldae

TABLE 3: FORT POINT CHANNEL – UNDERWATER VIDEO SURVEY STATIONS

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
FP1	42.354713	-71.049691	-18.0	Silt/Shell	Silt and shell rubble with tufts of attached macroalgae.
FP2	42.354515	-71.050530	-11.1	Debris	Silt with anthropogenic debris, shell rubble, and a dense layer of microbial algae
FP3-Start	42.353388	-71.050851	-19.2	Structure	Silt with a thin microbial algal mat and moderate density of tunicates on MBTA tunnel surface
FP3-End	42.353139	-71.050924	-17.9	Silt	Silt and shell rubble with algal/ macroalgal growth and large metallic debris
FP4	42.352721	-71.051285	-16.5	Silt	Silt and trace anthropogenic debris with a dense cover of microbial algae
FP5	42.351813	-71.052293	-5.8	Silty Sand /Gravel/Shell	Silty sand and gravel with a moderate cover of macroalgae, many periwinkles present
FP6	42.350126	-71.052902	-11.4	Debris	Large sunken metal barge with attached sponges, tunicates, ectoprocts, and hydroids
FP7	42.350070	-71.053392	-7.4	Silt	Silt with a dense cover of microbial algae and filamentous macroalgae, epifaunal invertebrate tracks visible
FP8-Start	42.348469	-71.054460	-10.2	Sandy Silt/Gravel	Sandy silt and gravel
FP8	42.348610	-71.054449	-7.5	Structure	Sheet pile retaining wall with adjacent silt, anthropogenic debris, and shell rubble
FP8-End	42.348675	-71.054432	-8.8	Gravel	Gravel with attached macroalgae
FP9-Start	42.347306	-71.054953	-13.7	Gravel	Gravel adjacent to northern side of concrete tunnel structure
FP9	42.347052	-71.054955	-10.0	Silt	Silt over concrete substrate with a thick layer of mixed macroalgae and microbial algae
FP9-End	42.346899	-71.055060	-9.7	Silt/Gravel/Shell	Gravel with a moderate cover of filamentous macroalgae
FP10	42.345884	-71.055464	-11.0	Macroalgae	Silt with a dense to complete cover of macroalgae and microbial algae
FP11-Start	42.347992	-71.053582	-19.6	Structure	Sheet pile and fallen wood piling with tunicates, sponges, ectoprocts, and hydroids

TABLE 3: FORT POINT CHANNEL – UNDERWATER VIDEO SURVEY STATIONS (CONTINUED)

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
FP11-End	42.348037	-71.053444	-21.5	Debris	Bare silt with a thin layer of microbial algae and epifaunal invertebrate tracks
FP12	42.349922	-71.051858	-14.3	Gravel and Shell	Gravel with shell rubble, anthropogenic debris, and a thin layer of microbial algae
FP13	42.352554	-71.049784	-10.9	Debris	Indeterminate anthropogenic debris (possibly heavy fabric) on silt with dense cover of microbial algae and sparse filamentous macroalgae
FP14	42.354645	-71.048761	-14.4	Silt	Silt with a thick cover of microbial algae and scattered anthropogenic debris

3.4 Downtown Waterfront

The survey footprint along the Downtown waterfront covered an area from the eastern side of US Coast Guard Station Boston to the mouth of the Fort Point Channel. A total of 51 transects covering 5.8 linear miles within a 63.4 acre investigation area were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 306,992 processed bathymetric soundings (Figure 12). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 150-foot swath (75 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 13), features observed in the bathymetric model of the investigation area, and underwater video survey data (Figure 14, Table 4, and Appendix B) also demonstrated excellent agreement. Tidal stage and excellent water clarity during the hydroacoustic survey enabled the field crew to make observations of shallow submerged structure and intertidal habitat along the waterfront. Photographic documentation supporting shoreline characterization within this investigation area is presented in Appendix A.

Shoreline Characterization

The shoreline along the Downtown waterfront is dominated by a series of earthen-filled wharves and associated piling supported pier structures projecting into the harbor, with narrow basins situated between them. From north to south, these include Battery Wharf, Burroughs Wharf, Union Wharf, Sargent's Wharf, Lewis Wharf, Commercial Wharf, Long Wharf, Central Wharf, India Wharf, and Rowes Wharf. The shoreline along the waterfront consists of stone seawalls and sheet pile bulkheads from which the piling-supported structures extend. Numerous drainage outfalls discharge to the harbor from these features. The bulkheads and pilings supported sparse algae, macroalgae, barnacles, and patches of mussels. Many public and private docks are situated along the waterfront. Notable waterfront facilities and attractions within the investigation area include the Boston Sailing Center on Lewis Wharf, ferry terminals on Long Wharf, the New England Aquarium on Central Wharf, and Boston Harbor City Cruises on Rowe's Wharf. The Boston Harborwalk runs along the perimeter of the public waterfront. The surrounding area consists of a heavily developed urban cityscape.

Hydroacoustic Data Interpretation

Tide corrected depths within the investigation area ranged from +3 to -39 feet MLLW. The seafloor within the intermittent basins was generally -10 to -20 feet deep, shoaling to shallow subtidal or intertidal depths along the adjacent bulkheads and seawalls. Water depths within the small boat docks on the north side of Long Wharf and the inner portion of the basin between Long Wharf and Commercial Wharf were -10 feet or less. The sediment surface within the piling supported portion of the waterfront structures was rough and irregular, with depths typically ranging from -1 to -20 feet by area. Ambient harbor depths seaward of the waterfront structures were -20 to -30 feet, gently sloping towards the 35 foot Waterfront Channel of the FNP before dropping sharply into the channel. A series of shallow circular depressions corresponding to

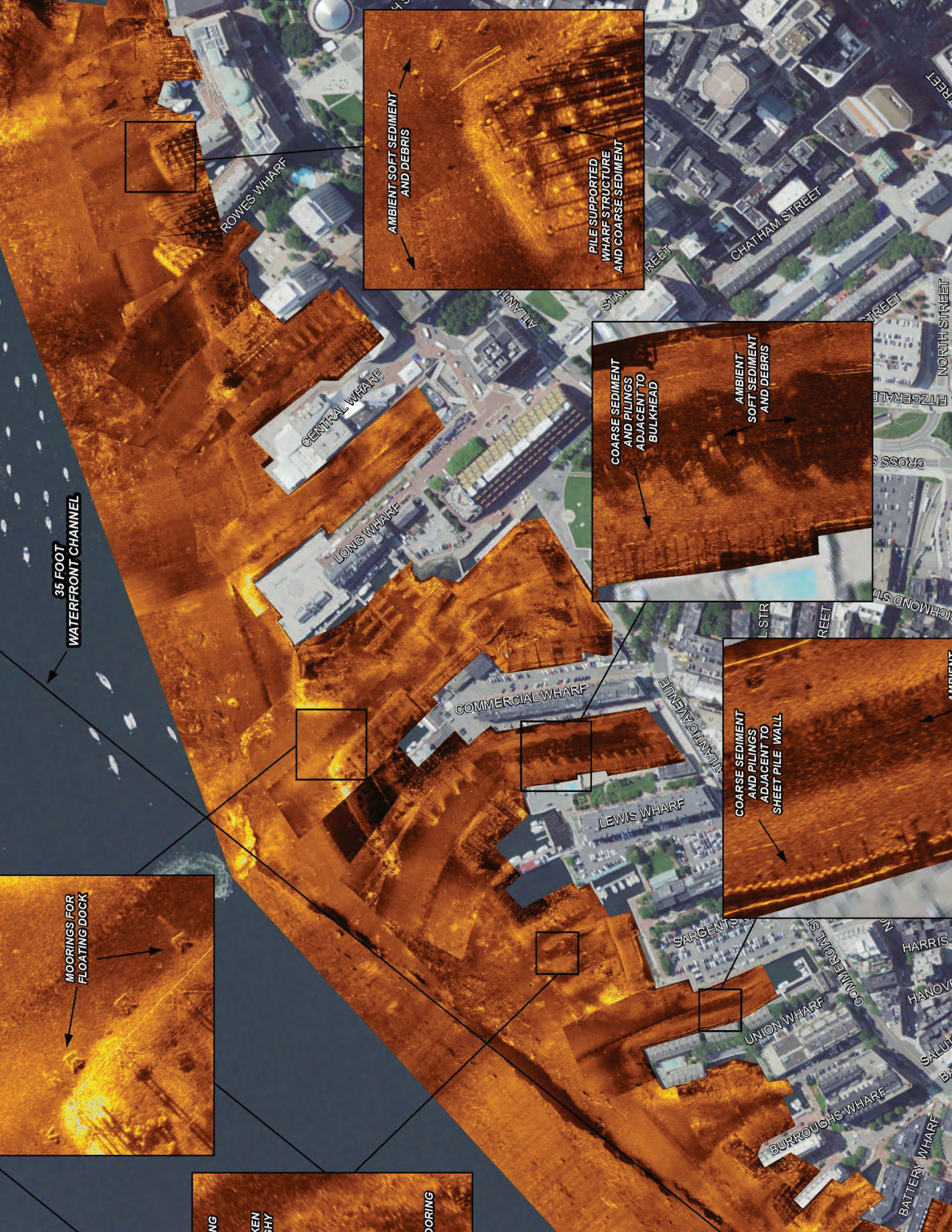
mooring scars were documented in the anchorage located between the 35 foot Waterfront Channel and the seaward face of Long Wharf, India Wharf, and Rows Wharf. A less pronounced version of these features was observed in the Boston Sailing Center mooring field located off Lewis Wharf and Sargents Wharf.

Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and waterfront structures throughout the investigation area, transitioning to ambient soft sediments. The subsurface portion of shoreline features including sheet pile bulkheads, support pilings, and anchoring features were all discernable and well documented in the survey data set. Numerous isolated targets corresponding to scattered anthropogenic debris were present within the ambient soft harbor sediments. These were especially prevalent in the anchorage areas, which also contained targets corresponding to moorings, associated tackle, and areas of disturbed sediment. The ruins of historic waterfront structures were apparent along the seaward face of Lewis Wharf, Sargents Wharf, and on the northern side of Union Wharf. Other features of interest within the investigation area included the seawater intake for the New England Aquarium located off Central Wharf, the mooring system for the floating dock complex adjacent to Commercial Wharf, and a small sunken boat in the mooring field off Sargents Wharf.

Benthic Habitat Characterization

Benthic habitat along the Downtown Boston waterfront was primarily characterized by silt with infaunal invertebrate tubes and burrows (roughly 60% of video stations). Several stations contained mixed silt and shell material (DT-5, DT-9, DT-10, DT-19, and DT-25) or silt with anthropogenic debris (DT-1, DT-15, and DT-21). The video survey also documented areas of shell reef habitat (DT-6 and DT-27), comprised of mostly living and non-living mussel shells (*Mytilidae* spp.) with attached hydroids, ectoprocts, macroalgae, and barnacles. Many areas with large submerged anthropogenic structures were documented along the waterfront, especially within the ruins of historic piling-supported structures. Footage from video station DT-2 showed submerged wood and metal structures with a moderate cover of macroalgae, encrusting sponges, hydroids, and ectoprocts; DT-14 documented submerged piling debris with a sparse cover of mussels (*Mytilidae* spp.); and DT-24 showed gravel and shell material with large wood and metal structures lying on the seafloor with a dense cover of macroalgae. There were also several areas characterized by coarse gravel, cobbles, or boulders—mostly located adjacent to bulkheads or wharves. Video station DT-17 exhibited gravel and shell hash while DT-18 and DT-20 contained cobbles with attached macroalgae. Boulder habitat was documented at DT-24 with a dense cover of filamentous macroalgae. In general, the rock, shell, and anthropogenic debris reef habitats were documented near shoreline bulkheads or wharves, while the ambient silty seafloor was observed within the central portion of basins or seaward of wharves, toward the federal channel.





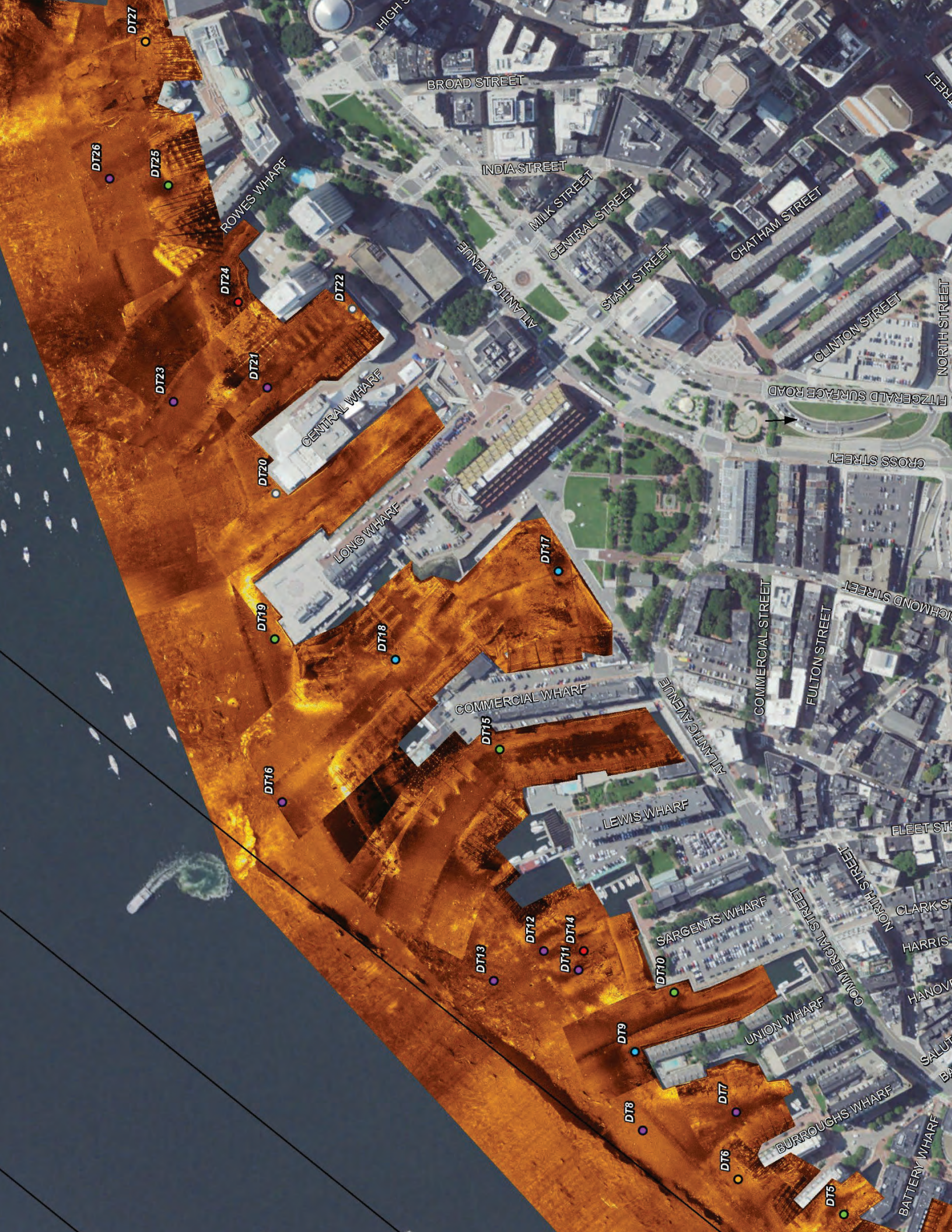


TABLE 4: DOWNTOWN WATERFRONT – UNDERWATER VIDEO SURVEY STATIONS

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
DT1	42.368000	-71.049995	-24.5	Silt	Bare silt with sparse infaunal invertebrate tubes and burrows, anthropogenic debris with attached tunicates and sponges visible
DT2	42.367528	-71.049639	-15.7	Debris	Wooden submerged anthropogenic debris with mixed macroalgae, encrusting sponges hydroids, and tunicates
DT3	42.367427	-71.049119	-29.9	Silt	Bare silt with small infaunal invertebrate tubes and burrows
DT4	42.367171	-71.048415	-35.7	Silt	Bare silt with small infaunal invertebrate burrows
DT5	42.366906	-71.049756	-14.3	Silt/Shell	Silt with sparse shell rubble, sparse red filamentous macroalgae
DT6	42.366223	-71.048948	-18.6	Mussel Shell	Silt and mussel shell rubble with attached hydroids and trace red sheet macroalgae
DT7	42.365740	-71.049302	-20.9	Silt	Bare silt, epifaunal invertebrate tracks visible
DT8	42.365486	-71.048313	-26.0	Silt	Bare silt with sparse small infaunal invertebrate burrows
DT9	42.364899	-71.048677	-15.8	Sand/Gravel/Shell	Silty sand with gravel and shell rubble, sparse cover of red sheet macroalgae, infaunal invertebrate castings visible
DT10	42.364643	-71.049379	-12.9	Silt/Gravel/Shell	Silt with moderate shell debris and gravel, trace woody debris present
DT11	42.364091	-71.048593	-17.5	Silt	Bare silt with epifaunal invertebrate tracks
DT12	42.363813	-71.048368	-21.2	Silt	Bare silt with infaunal invertebrate burrows and epifaunal invertebrate tracks
DT13	42.363819	-71.047729	-26.9	Silt	Bare silt with infaunal invertebrate burrows
DT14	42.363979	-71.048746	-17.4	Debris	Anthropogenic debris, upright wooden piling and wooden support legs visible, patch of mussels attached to the wood substrate
DT15	42.362210	-71.049069	-16.3	Silt/Shell	Silt and shell rubble with thin microbial algal mat on sediment surface, debris in view

TABLE 4: DOWNTOWN WATERFRONT – UNDERWATER VIDEO SURVEY STATIONS (CONTINUED)

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
DT16	42.361686	-71.046712	-25.4	Silt	Bare silt with small infaunal invertebrate tubes and burrows
DT17	42.361194	-71.050621	-4.3	Gravel and Shell	Gravel with shell rubble
DT18	42.361147	-71.048579	-17.6	Sand/Shell/Gravel/Cobble	Sand, gravel, and shell with interspersed cobbles, sparse cover of mixed macroalgae
DT19	42.360506	-71.047549	-21.0	Silt/Shell	Shelly silt with many infaunal invertebrate castings visible
DT20	42.359485	-71.048368	-3.9	Gravel/Cobble	Gravel and cobble with moderate to dense cover of mixed macroalgae
DT21	42.358700	-71.048874	-27.5	Silt	Bare silt with small infaunal invertebrate burrows and anthropogenic debris
DT22	42.358498	-71.050122	-14.9	Cobble/Boulder	Cobble and boulder pile with dense cover of mixed filamentous macroalgae and bushy ectoprocts
DT23	42.358414	-71.047905	-29.1	Silt	Bare silt with infaunal invertebrate burrows and several tunicates
DT24	42.357978	-71.049074	-7.3	Debris	Large anthropogenic structure (wood and metal) with attached mixed macroalgae on gravel and shell substrate
DT25	42.356866	-71.049060	-22.6	Silt/Shell	Silt with shell rubble.
DT26	42.356579	-71.048537	-23.3	Silt	Bare silt
DT27	42.355759	-71.049640	-19.4	Shell Reef	Shell rubble reef comprised of mostly mussel shells

3.5 Charlestown Navy Yard

The survey footprint in the Charlestown Navy Yard component of the CSRM Feasibility study covered an area from the Charlestown Navy Yard Ferry Terminal to the head of Dry Dock 2. A total of 3 transects covering 0.4 linear miles within a 2.8 acre investigation area were surveyed to produce a 3x3 foot gridded matrix consisting of 12,824 processed bathymetric soundings (Figure 15). The physical setting and water column conditions within the inner portion of the Dry Dock structure prevented the field crew from recording usable hydroacoustic data, even after adjusting the transmit power and gain settings of the Edgetech 6205 echosounder. Usable survey data was limited to the investigation area outside the dry dock and a short way inside. Water depths in this area were sufficient to generate high quality side scan sonar imagery within an 80-foot swath (40 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area outside the dry dock entrance and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 18), and features observed in the bathymetric model of the investigation area demonstrated excellent agreement. Underwater video survey imagery was not collected from this location. Photographic documentation supporting shoreline characterization within the investigation area is presented in Appendix A.

Shoreline Characterization

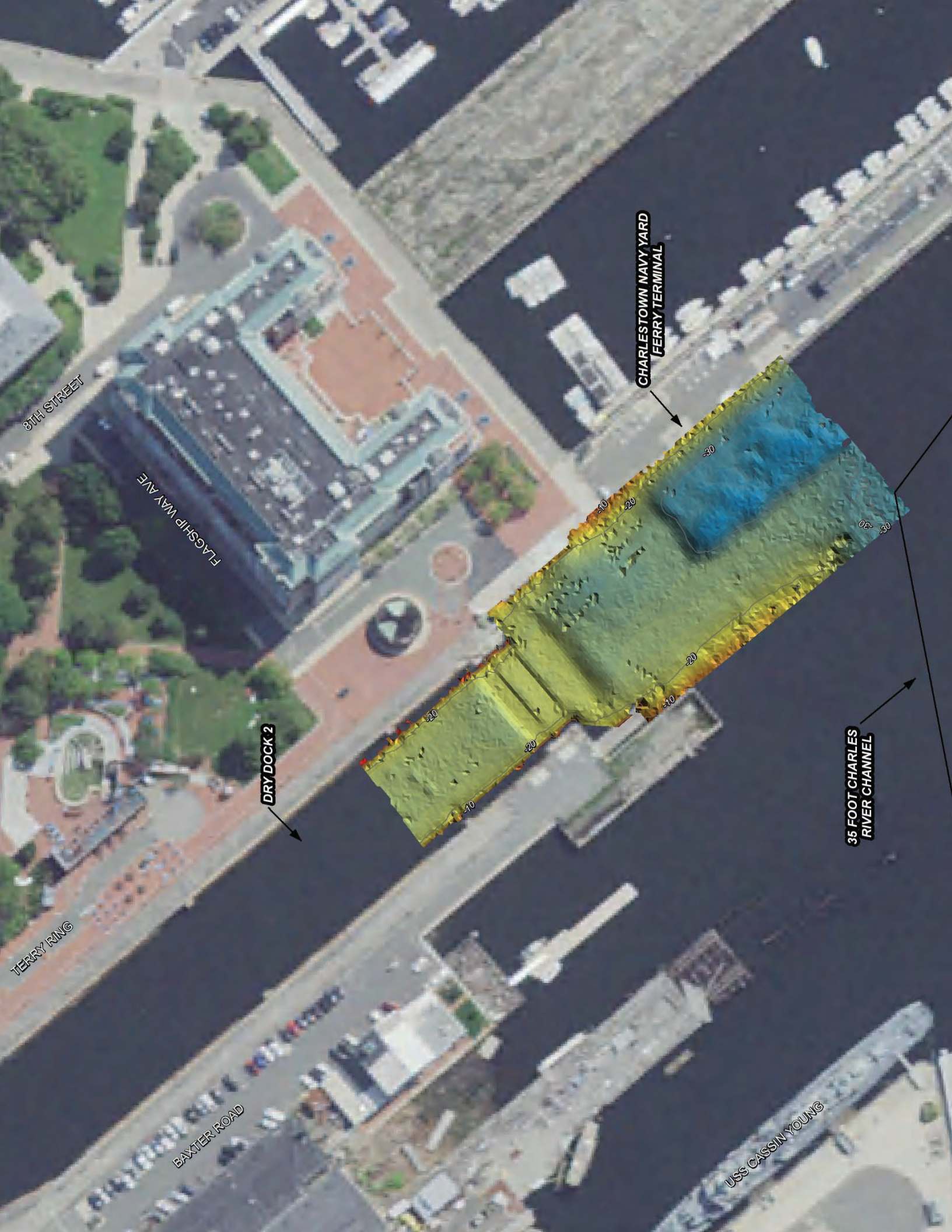
The waterfront in the vicinity of the Charlestown Navy Yard investigation area is heavily developed. Concrete bulkheads, piling supported piers, and the stone structure of Dry Dock 2 border the entire shoreline. The pier of the Charlestown Navy Yard Ferry Terminal is located along the north side of the basin outside the dry dock entrance, and includes a floating dock system. The surrounding area includes a large waterfront office complex, Charlestown Naval Shipyard Park, the USS Constitution Museum, and historic Navy Yard structures.

Hydroacoustic Data Interpretation

Tide corrected depths within the investigation area ranged from -1 to -35 feet MLLW. The bathymetric profile outside the entrance to the dry dock consisted of a basin with ambient depths ranging from 25 to -30 feet between the Ferry Terminal to the north and the ruins of a historic pier structure to the south. The seabed along the margin of these structures shoaled rapidly to shallow subtidal depths, typically -10 feet or less. A dredged birth with depths up to -35 feet was present in the outer portion of the basin, adjacent to the Ferry Terminal pier. The entrance to the dry dock structure shoaled to approximately -21 feet in the vicinity of the caisson seat before transitioning to the curved surface of the interior dry dock floor and walls, with surveyed depths ranging from -1 to -23 feet.

Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and waterfront structures outside the entrance to the dry dock, transitioning to ambient soft sediments within the basin. The subsurface portion of shoreline

features including sections of sheet pile wall, concrete bulkheads, support pilings, and structures associated with the dry dock were all discernable and well documented in the survey data set. The floor of the dry dock interior transitioned from the stepped stone wall with coarser sediments along the base to the stone floor with a veneer of accumulated soft sediment. Other features of interest within the investigation area included the partially obscured caisson seat at the entrance to the dry dock, and an area of anthropogenic debris in the ruins of the historic pier structure to the south of the basin.



8TH STREET

FLAGSHIP WAY AVE

DRY DOCK 2

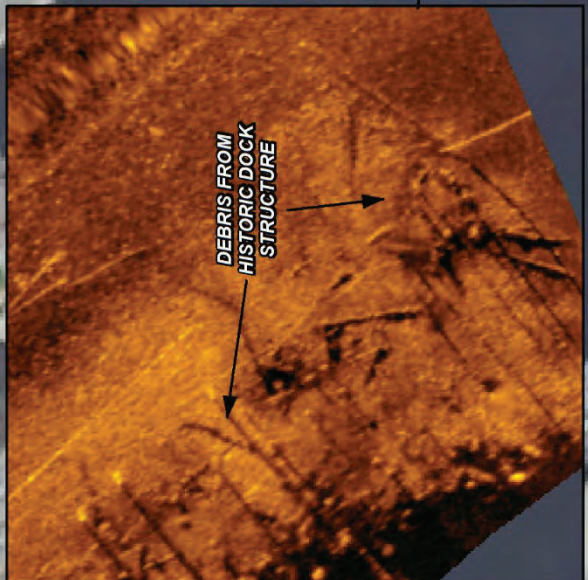
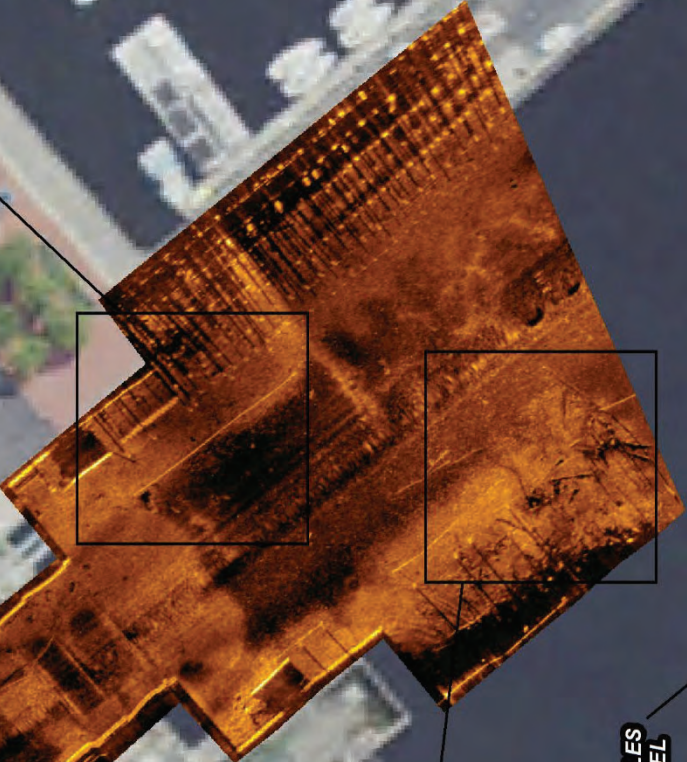
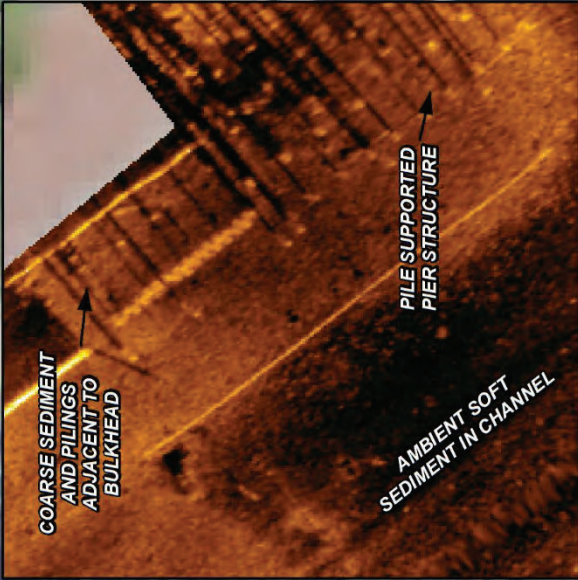
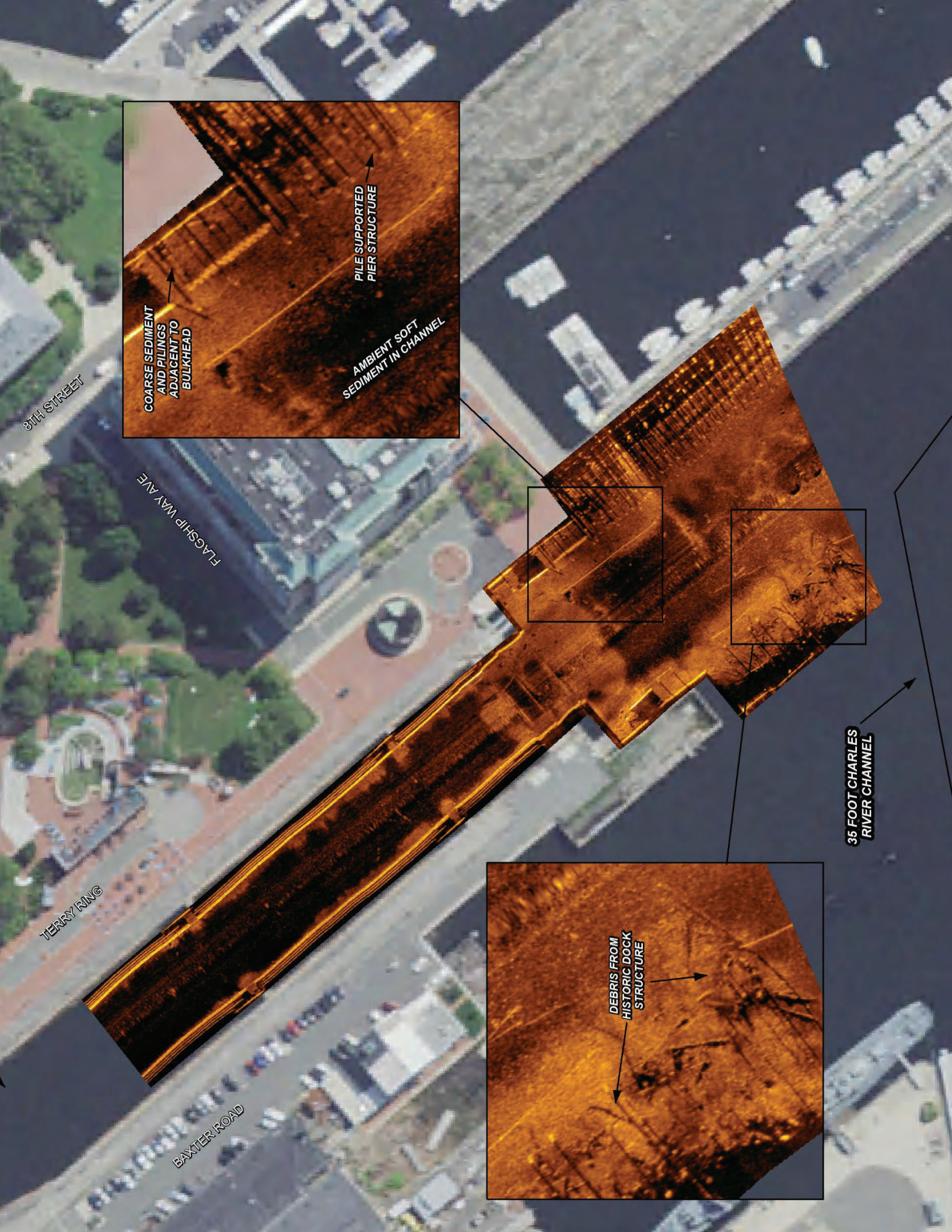
TERRY RING

BAXTER ROAD

CHARLESTOWN NAVY YARD
FERRY TERMINAL

35 FOOT CHARLES
RIVER CHANNEL

USS CASSIN YOUNG



3.6 Little Mystic Channel

The survey footprint in the Little Mystic Channel covered the entire waterway from the mouth near the Spaulding Rehabilitation Hospital to the head adjacent to the Charlestown athletic fields. A total of 6 transects covering 2.4 linear miles within a 21.9 acre investigation area were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 106,224 processed bathymetric soundings (Figure 17). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 150-foot swath (75 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 18), features observed in the bathymetric model of the investigation area, and underwater video survey data (Figure 19, Table 5, and Appendix B) also demonstrated excellent agreement. Tidal stage and excellent water clarity during the hydroacoustic survey enabled the field crew to make observations of shallow submerged structure and intertidal habitat along the waterfront. Photographic documentation supporting shoreline characterization within this investigation area is presented in Appendix A.

Shoreline Characterization

The waterfront along the Little Mystic Channel is heavily developed, with stone seawalls and sheet pile bulkheads bordering the entire shoreline. A piling-supported wharf and concrete loading platform runs along the Mystic Marine Fuel facility to the north. These structures supported algae, macroalgae, and barnacles. The Maurice J. Tobin Bridge (US Route 1) and the Chelsea Street Bridge both span the investigation area footprint, with the piers of the Chelsea Street Bridge located in the waterway. The boat ramp in Little Mystic Channel Park along the northwestern portion of the channel is the primary public boat access for the harbor. The surrounding area includes hospitals (Spaulding Rehabilitation and MGH Children's Center), industrial areas (the Boston Autoport), commercial property, parks, community gardens, and residential development.

Hydroacoustic Data Interpretation

Tide corrected depths within the investigation area ranged from +5 to -39 feet MLLW. Ambient depths within the channel above the Chelsea Street Bridge ranged from -20 to -30 feet, rising to shallow subtidal depths along the shoreline, with several exposed intertidal areas along the base of the stone seawall. The seabed along the southern shoreline, from a point approximately 250 feet west of the Chelsea Street Bridge to the mouth of the channel, sloped gently to the north with depths ranging from 0 to -10 feet before dropping steeply into the channel. The portion of the channel below the Chelsea Street Bridge reached depths approaching -40 feet. Clusters of depressions arranged in a scalloped fan pattern along with individual depressions corresponding dredge bucket impressions and areas of disturbed seabed from recent channel maintenance activities were observed within this area.

Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and along anthropogenic structures within the waterway, transitioning to

ambient soft sediments. The subsurface portion of structures including sheet pile bulkheads, support pilings, bridge piers, and fendering systems were discernable and well documented in the side scan sonar imagery. The ambient seabed within the portion of the channel above the Chelsea Street Bridge was interrupted by numerous targets corresponding to debris and isolated piles of mounded coarse material. These were particularly prevalent at the head of the channel in the area adjacent to the boat ramp. The ruins of a large historic dock structure were present along the southern shoreline across from the Little Mystic Channel Park. Other features of interest within the investigation area included a large sunken barge (measuring 90 feet by 35 feet) and associated debris field, the wreck of a power boat (measuring approximately 17 feet by 6 feet), and a sunken excavator or barge crane (measuring approximately 25 feet x 15 feet with a 30 foot boom projecting outward to the southwest) adjacent to the Mystic Marine Fuel facility.

Benthic Habitat Characterization

Benthic habitat within the shallow nearshore areas bordering the channel was characterized by gravel and shell with a sparse cover of macroalgae (LM-5). Within the interior of the channel, benthic habitat was typically composed of bare silt with infaunal invertebrate tubes and burrows, and tunicates sparsely attached to scattered anthropogenic debris (LM-2 and LM-7). Near the mouth of the channel, at video station LM-8, submerged pilings and other debris laying on the silty substrate hosted patches of mussels (*Mytilidae* spp.).

The underwater video survey provided additional documentation of the wrecks and debris piles throughout the channel, especially to the west of the Tobin and Chelsea Street Bridges. Video station LM-1 was located on a metal debris pile located on the western end of the channel just south of the boat ramp. The metal debris had dense cover of tunicates, sponges, ectoprocts, and hydroids and rested on a silt bottom with scattered gravel and shell material. Video station LM-3 was positioned on a small sunken vessel covered with a similar assemblage of attached sessile organisms, resting on an ambient silt bottom approximately 420 feet to the east of LM-1. About 60 feet to the east of LM-3 was a large sunken metal barge, mostly covered with a veneer of silt with sparse microbial algal and benthic macroalgal growth but also hosted densely covered patches of tunicates (e.g., *Ciona intestinalis*, *Clavelina* sp., and *Styela clava*), bushy ectoprocts (*Bugula* sp.), and mixed macroalgae. Along the northern edge of the channel, 300 feet west of the Chelsea Street Bridge, the shallow nearshore habitat was covered by anthropogenic metal debris exhibiting a dense cover of mixed macroalgae, bushy ectoprocts, hydroids, encrusting sponges, and tunicates (e.g., *Clavelina* sp. and *Styela clava*).



40 FOOT MAIN
SHIP CHANNEL

SPaulding REHABILITATION
HOSPITAL

SIXTEENTH STREET

THIRD AVENUE

FIFTH AVENUE

THIRTEENTH STREET

US-1 MAURICE J. TOBIN BRIDGE

CHELSEA STREET

OBRIEN COURT

WOLFORD WAY

STARR KING COURT

COREY STREET

MEDFORD STREET

OLD LANDING WAY

MYSTIC MARINE FUEL

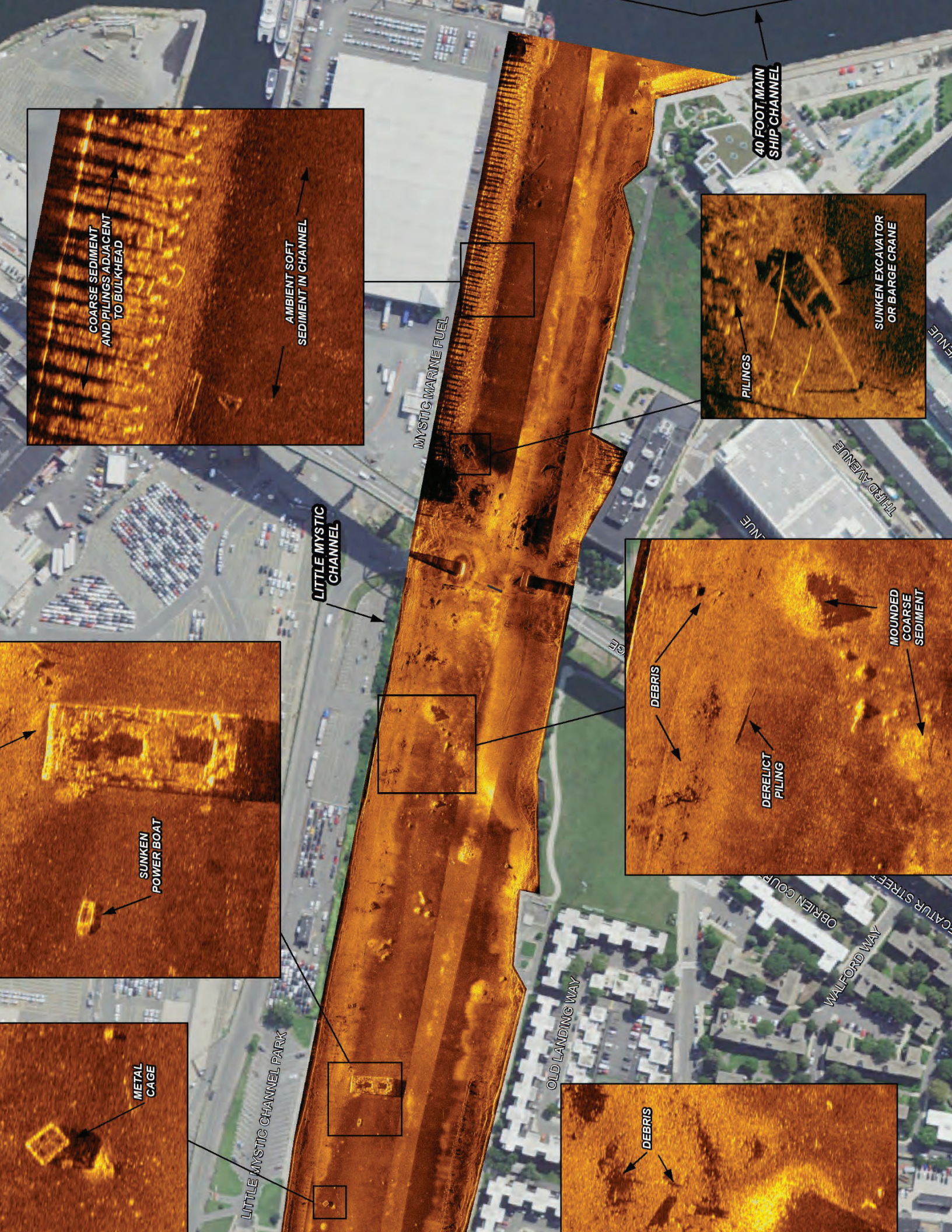
LITTLE MYSTIC CHANNEL

LITTLE MYSTIC CHANNEL PARK

L STREET

BOSTON AUTOPORT

US-1 MAURICE J. TOBIN BRIDGE



40 FOOT MAIN SHIP CHANNEL

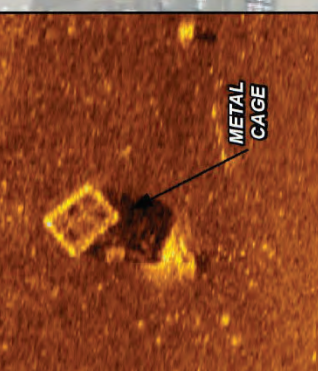
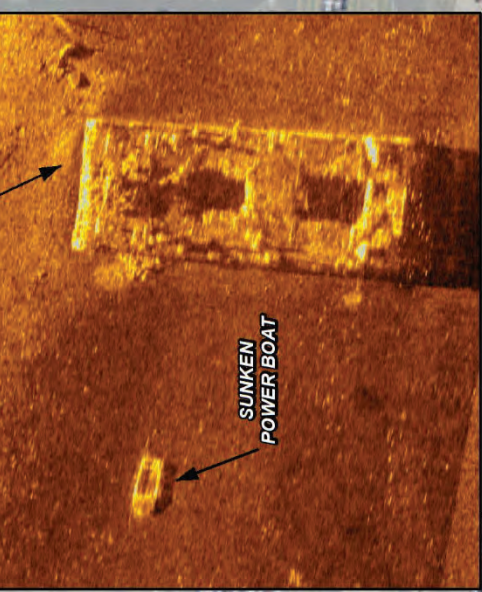
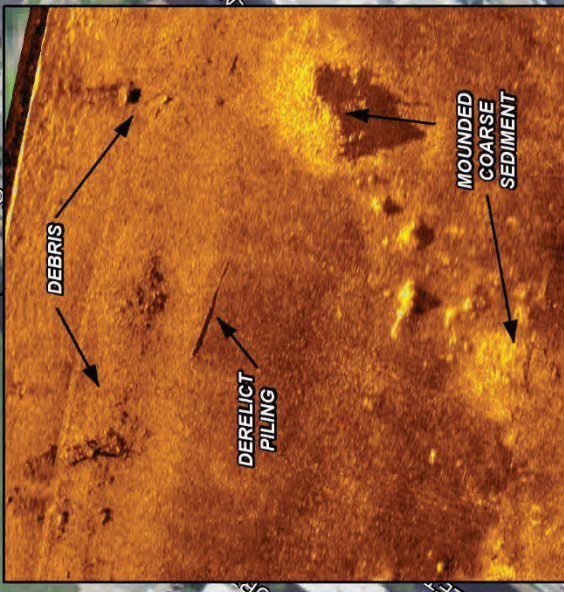
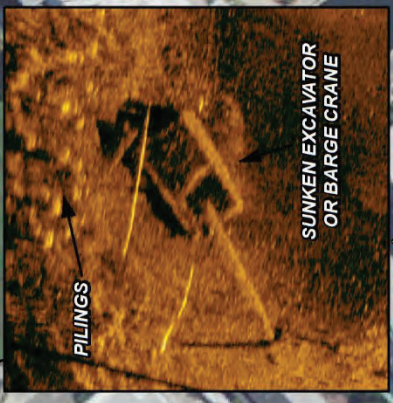
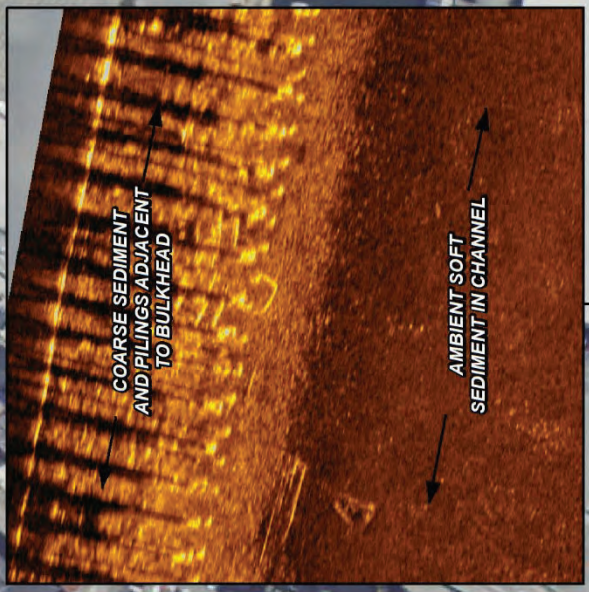
MYSTIC MARINE FUEL

LITTLE MYSTIC CHANNEL

OLD LANDING WAY

WALLFORD WAY

O'BRIEN COURT





BOSTON AUTOPORT

LITTLE MYSTIC CHANNEL PARK

MYSTIC MARINE FUEL

OLD LANDING WAY

COREY STREET

WALFORD WAY

OBRIEN COURT

US-1 MAURICE J. TOBIN BRIDGE

CHelsea STREET

THIRTEENTH STREET

FIFTH AVENUE

THIRD AVENUE

SIXTEENTH STREET

SPALDING REMEDIATION
MASON HOSPITAL

40 FOOT MAIN
SHIP CHANNEL

US-1 MAURICE J. TOBIN BRIDGE

TABLE 5: LITTLE MYSTIC CHANNEL – UNDERWATER VIDEO SURVEY STATIONS

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
LM1	42.38116	-71.05746	-17.2	Sand/Gravel/Shell	Sand, gravel, and shell, anthropogenic metallic debris with attached tunicates, sponges, ectoprocts, and hydroids
LM1-2	42.38122	-71.057338	-20.7	Debris	Anthropogenic metallic debris with dense cover of tunicates, sponges, ectoprocts, and hydroids
LM2	42.38081	-71.05622	-28.3	Silt	Silt with infaunal invertebrate burrows and anthropogenic debris
LM3	42.38096	-71.055945	-27.2	Debris	Sunken boat hull covered with indeterminate fouling organisms
LM4	42.38088	-71.055673	-20.6	Debris	Large sunken barge with a thin cover of microbial algae visible, trace encrusting sponges, and filamentous macroalgae
LM5	42.38005	-71.053372	-3.4	Sand/Gravel/Shell	Sandy gravel and shell with sparse cover of macroalgae
LM6	42.38076	-71.052789	-10.6	Debris	Anthropogenic metal debris with dense cover of mixed macroalgae, bushy ectoprocts, hydroids, encrusting sponges and tunicates
LM7	42.37994	-71.049614	-36.9	Silt	Bare silt with infaunal invertebrate tubes and burrows
LM8	42.37914	-71.048053	-35.0	Silt/Shell	Silt and mussel reef

3.7 Chelsea River

The survey footprint in the Chelsea River component of the CSRM Feasibility study covered an area of the East Boston shoreline from a point 400 feet upstream of the Chelsea Street Bridge to the Boston Car Rental facility. A total of 9 transects covering 2.5 linear miles within a 20.8 acre investigation area were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 101,055 processed bathymetric soundings (Figure 20). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 150-foot swath (75 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 21), features observed in the bathymetric model of the investigation area, and underwater video survey data (Figure 22, Table 6, and Appendix B) also demonstrated excellent agreement. Tidal stage and excellent water clarity during the hydroacoustic survey enabled the field crew to make observations of shallow submerged structure and intertidal habitat along the waterfront. Photographic documentation supporting shoreline characterization within this investigation area is presented in Appendix A.

Shoreline Characterization

The shoreline in the survey area is dominated by a riprap seawall spanning the majority of the East Boston waterfront. Multiple outfalls and drainage features discharge to the waterway from this structure. The intertidal habitat below the seawall consists primarily of mixed coarse substrate (cobble, gravel, and sand). The adjacent, unarmored shoreline sections have a similar composition. The remnant of historic waterfront structures are visible in several locations, and all areas contain scattered anthropogenic debris. Structures and hard substrate within the area support sparse algal, macroalgal, and barnacle growth. The surrounding area consists of developed commercial and industrial land with the heavily trafficked Massachusetts Route 1A behind these properties. The Massachusetts Water Resources Authority (MWRA) Caruso Pumping Station is located along the shoreline immediately to the south, between the investigation area and the Chelsea Street Bridge.

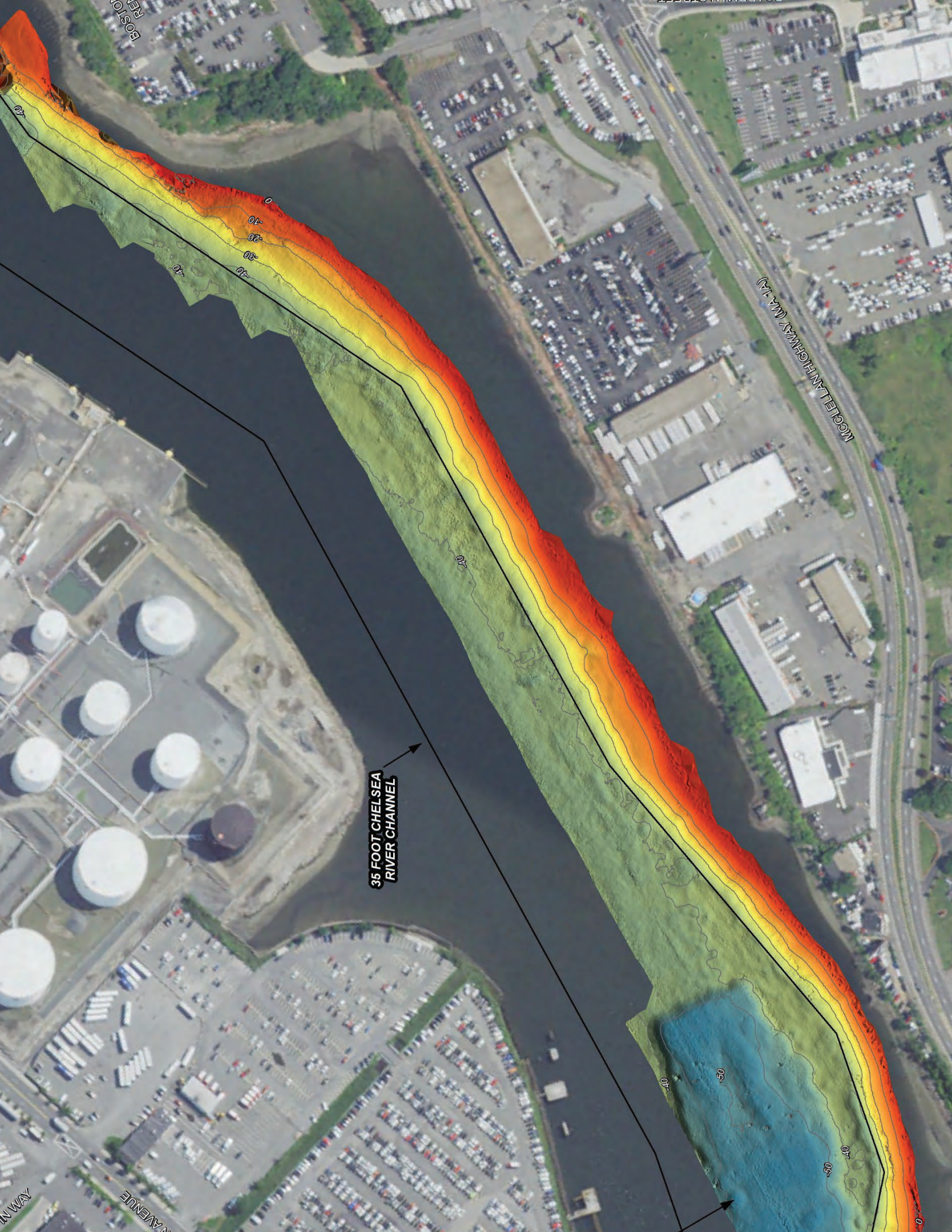
Hydroacoustic Data Interpretation

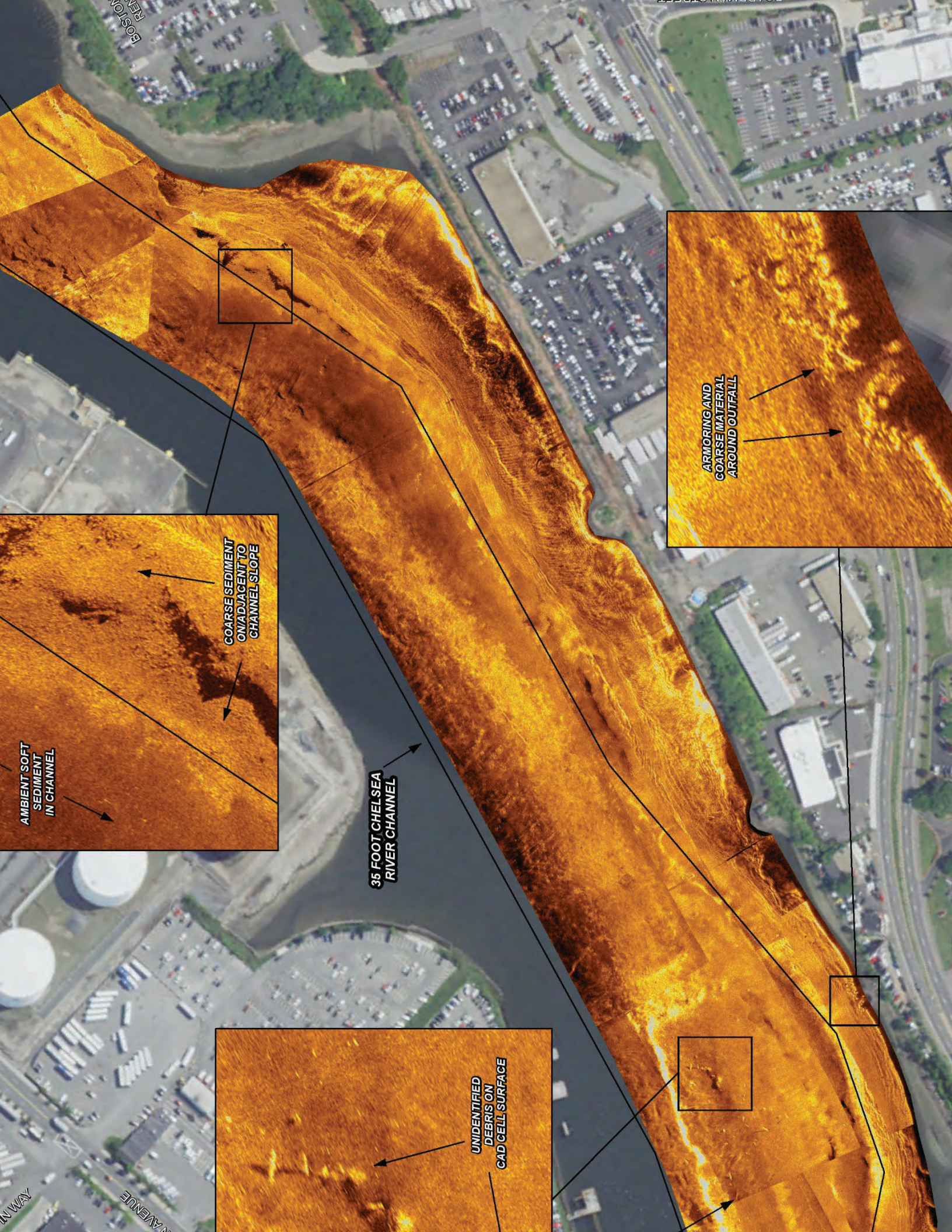
Tide corrected depths within the surveyed footprint ranged from +2 to -55 feet MLLW. Water depths within the intertidal portion of the investigation area were too shallow to effectively record soundings during the field effort, but still sufficient to document the seabed with side scan sonar imagery. The timing of the survey was selected as tradeoff to allow for better photo documentation of the seawall and other shoreline features. The seabed within the surveyed footprint consisted of intertidal and subtidal flats (<10 feet deep) along the shoreline that transitioned into the side slope of the FNP to the north before reaching ambient depths in excess of 40 feet within the Chelsea River Channel. The active Chelsea River Confined Aquatic Disposal (CAD) Cell is located within the FNP in the southern portion of the investigation area, and was generally 10 to 15 feet deeper than the surrounding seafloor.

Interpretation of side scan sonar data documented coarse sediments adjacent to the seawall, transitioning to ambient soft sediments within the FNP side slope and channel. Areas of scoured coarse material and armoring were discernable and well documented along the toe of the riprap wall, particularly in the vicinity of outfall structures. Scattered anthropogenic debris was visible throughout the intertidal area and on the surface of the Chelsea River CAD cell.

Benthic Habitat Characterization

Benthic habitat within the shallow subtidal area along the East Boston shoreline was characterized by sand with sparse gravel and shell hash (CC-1 and CC-4) with areas of gravel and shell debris (CC-6). The video survey documented an epifaunal community consisting of hermit crabs with tunicates sparsely attached to hard substratum within these areas. Within the routinely dredged FNP and active CAD cell, benthic habitat consisted of bare silt (CC-1 and CC-5) with scattered areas of sparse gravel and shell substrate (CC-3). The silt habitat contained small infaunal invertebrate tubes and burrows with bushy ectoprocts sparsely attached to any available hard substratum. A juvenile flounder was observed within the quadrat at CC-3 and an adult flounder was observed in the background of the profile-view camera at CC-5.





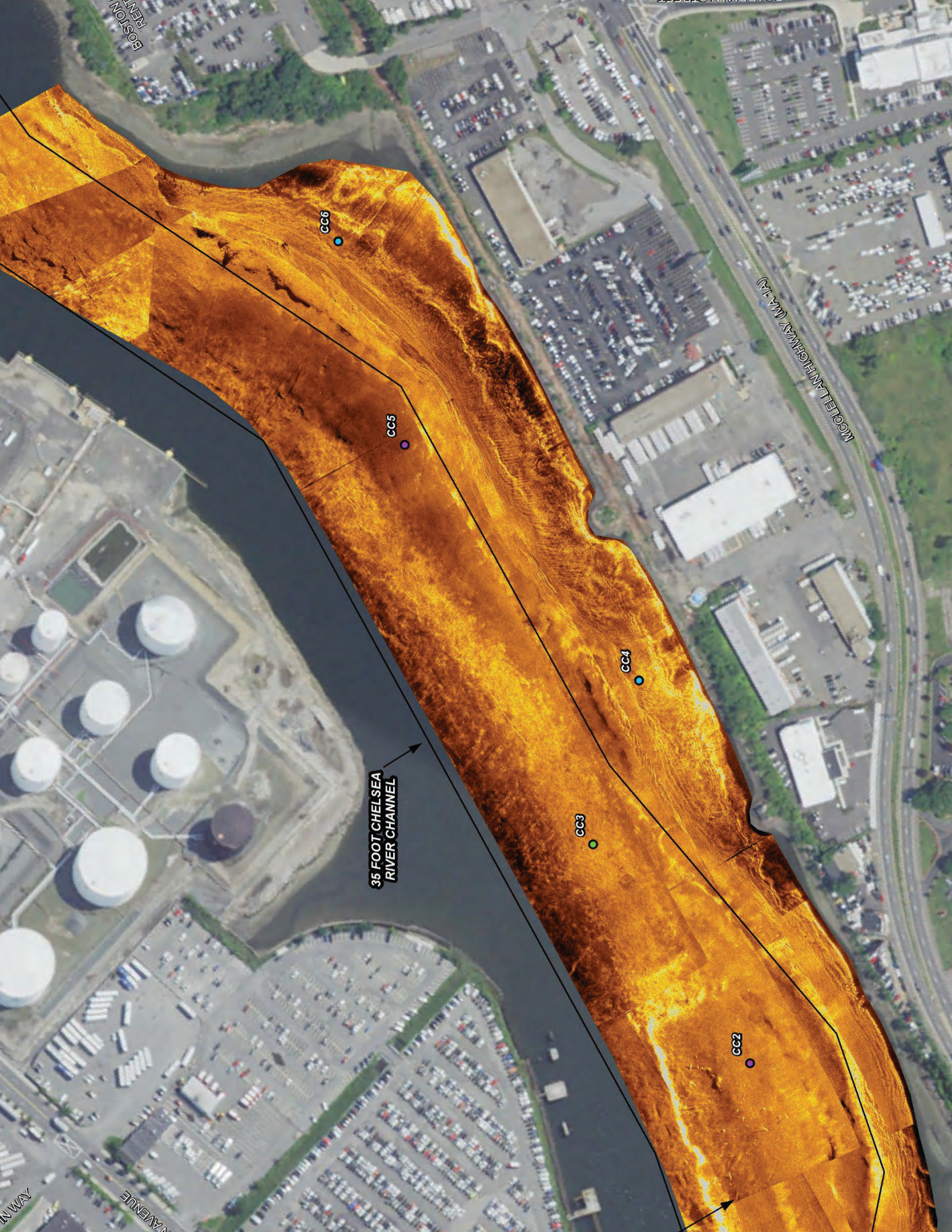


FIGURE 6: CHELSEA RIVER – UNDERWATER VIDEO SURVEY STATIONS

Station Name	Latitude (NAD83)	Longitude (NAD83)	Water Depth (MLLW)	Primary Substrate	Notes
CR1	42.386501	-71.020414	-5.3	Sand/Gravel/Shell	Sand with sparse gravel and shell hash, sparse cover of red sheet macroalgae and tunicates attached to hard substratum, several hermit crabs present
CR2	42.387856	-71.019612	-54.4	Silt	Silt and trace gravel with attached bushy ectoprocta, infaunal invertebrate burrows present
CR3	42.389227	-71.018760	-43.0	Silt/Gravel/Shell	Sandy silt with sparse to moderate gravel and shell hash/rubble, juvenile flounder present within quadrat
CR4	42.389461	-71.017508	-3.8	Sand/Gravel/Shell	Sand with sparse shell rubble and gravel, several hermit crabs present
CR5	42.391256	-71.016837	-40.0	Silt	Bare silt with sparse small infaunal invertebrate tubes and burrows, hermit crab and corresponding tracks present, adult flounder visible in background
CR6	42.392147	-71.015746	-5.0	Sand/Gravel/Shell	Gravel and shell debris with a moderate cover of barnacles (

3.8 Neponset River

The survey footprint in the Neponset River covered the western shoreline and central portion of the waterway in the vicinity of the Neponset bridge (carrying MA 3A) and the Neponset-Anderson railroad bridge. A total of 6 transects covering 1.6 linear miles within a 6.1 acre investigation area were successfully surveyed to produce a 3x3 foot gridded matrix consisting of 29,762 processed bathymetric soundings (Figure 23). Water depths in the survey area were sufficient to generate high quality side scan sonar imagery within a 100-foot swath (50 feet per channel) for each transect. The combination of swath and transect spacing resulted in greater than 200 percent coverage of the survey area and facilitated a detailed analysis of seabed features by ensonifying them from multiple directions. The position and reflectance properties of seabed features from opposite channels on adjacent transects demonstrated excellent agreement. Direct comparison of side scan sonar imagery (Figure 24), features observed in the bathymetric model of the investigation area, and ROV survey footage (Appendix B) also demonstrated excellent agreement. Tidal stage and excellent water clarity during the hydroacoustic survey enabled the field crew to make observations of shallow submerged structure and intertidal habitat along the waterfront. Photographic documentation supporting shoreline characterization within this investigation area is presented in Appendix A.

Shoreline Characterization

The waterfront along the Neponset River is heavily developed, with a stone seawall running the length of the western shoreline. A concrete slab walkway and support structure is located in front of the seawall below the Neponset bridge and continues downstream for approximately 350 feet. The adjacent area includes a mix of open space along the Neponset Trail, commercial property (Planet Fitness and a construction equipment supplier), and paved parking lots. Concrete and stone piers for the Neponset bridge and Neponset-Anderson railroad bridge are located within the waterway and support a mix of filamentous algae and barnacles.

Hydroacoustic Data Interpretation

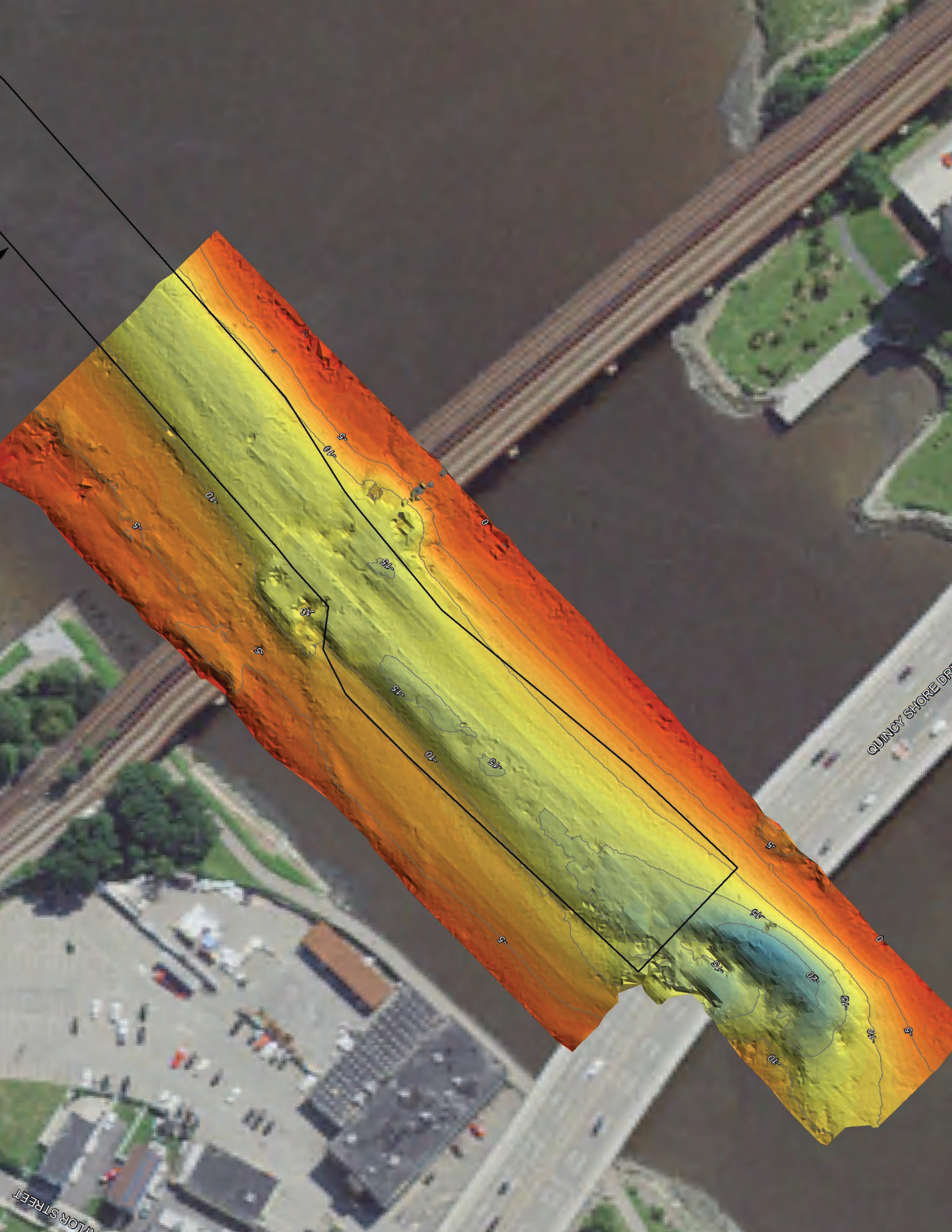
Tide corrected depths within the investigation area ranged from +2 to -25 feet MLLW. Ambient depths within the Dorchester Bay and Neponset River federal channel ranged from bathymetric profile within channel ranged from -12 to -18 feet. A large scour hole was present above the head of the FNP, between the piers of the Neponset bridge. Depths within this feature reached a maximum of -25 feet. The banks along either side of the FNP consisted of gently sloping subtidal to intertidal flats.

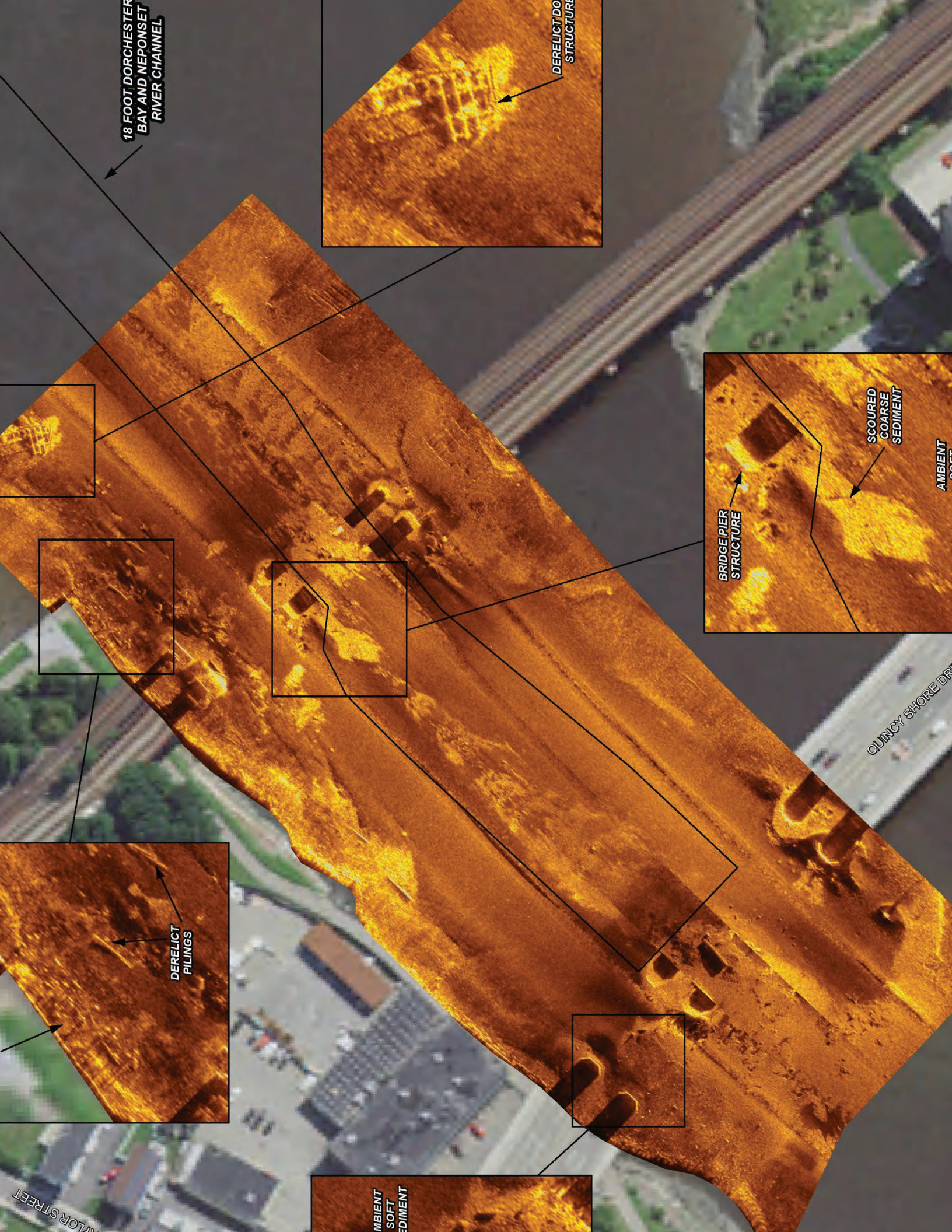
Interpretation of side scan sonar data documented areas of coarse sediment and anthropogenic debris immediately adjacent to the western shoreline, transitioning to soft sediments within the adjacent flats and channel profile. The subsurface portion of structures including the face of stone seawalls, support pilings, bridge piers, and fendering systems were discernable and well documented in the side scan sonar imagery. Areas of scoured coarse sediment and anthropogenic debris were present around the base of bridge pier structures and within the large scour hole described above. A pattern of rough, scoured sediment was also discernable within the deeper

portions of the channel profile. Other features of interest within the investigation area included a submerged, derelict dock structure and pilings laying on the riverbed along western shoreline, and the ruins of historic dock structures along the eastern shoreline.

Benthic Habitat Characterization

Benthic habitat within the intertidal and shallow subtidal riverbed along the western shoreline was characterized by sandy gravel and shell substrate with isolated small boulders, stone blocks, and scattered pieces of metallic and woody anthropogenic debris. Filamentous algae and a sparse cover of macroalgae were observed attached to hard substratum in this area. The deeper subtidal flats and adjacent channel slope consisted of bare silt with visible epifaunal invertebrate tracks. A thin layer of microbial algae was present along portions of the silty flat. The riverbed adjacent to the bridge pier structures consisted of scoured cobble, gravel, and shell rubble with no apparent biota. The upper portions of the pier structures supported filamentous algal growth and barnacles, with several crabs observed on the granite blocks.





18 FOOT DORCHESTER
BAY AND NEPONSET
RIVER CHANNEL

DERELICT DO
STRUCTURE

QUINCY SHORE DRIVE

AMBIENT
SEDIMENT

SCOURED
COARSE
SEDIMENT

BRIDGE PIER
STRUCTURE

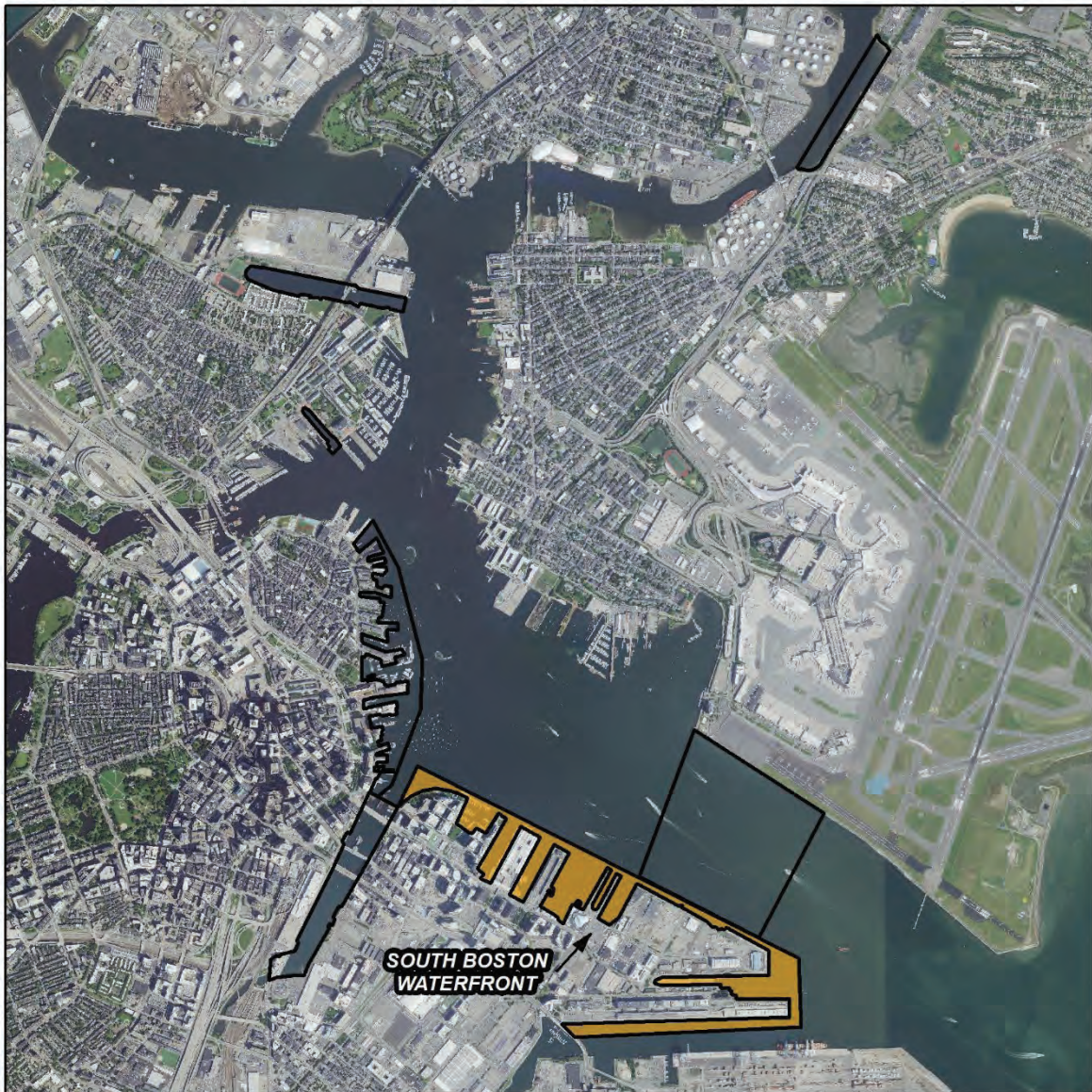
DERELICT
PILINGS

AMBIENT
SOFT
SEDIMENT

TAYLOR STREET

APPENDIX A
SHORELINE IMAGE DATABASE

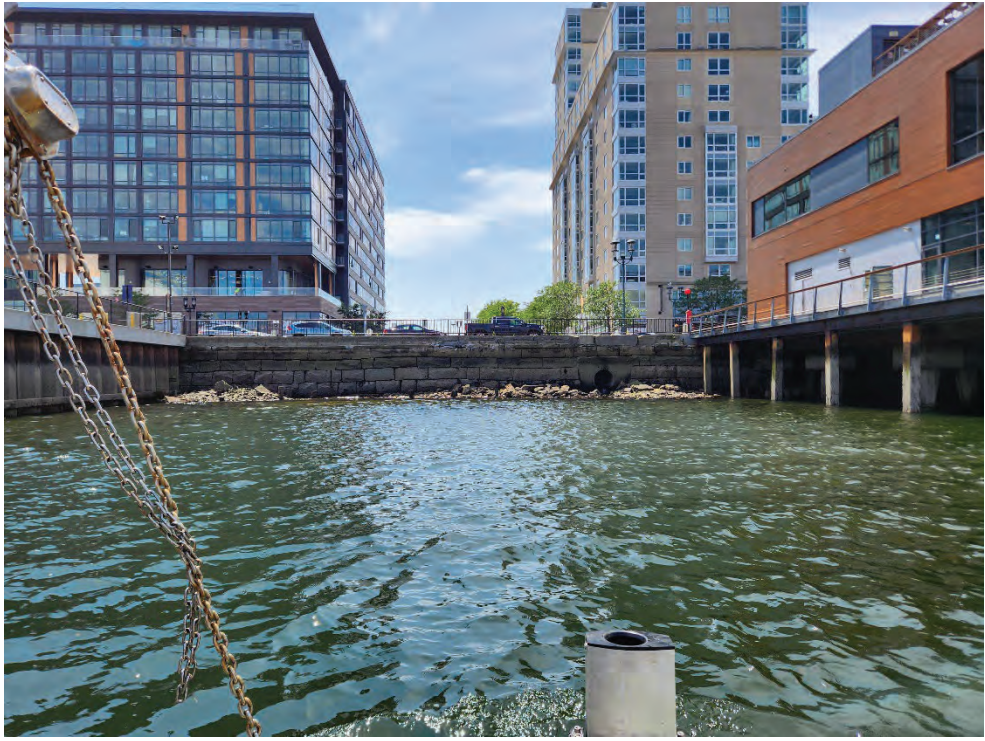
BOSTON HARBOR - SOUTH BOSTON WATERFRONT



Survey Area:	South Boston Waterfront	Date: 8/9/2023
Image	Description	
	- Channel between Legal Sea Foods HQ and Dry Dock II - Stone rip-rap - Algae, macroalgae, and upland vegetation	
	- Channel between Legal Sea Foods HQ and Dry Dock II - View of eastern pier of Boston Dry Dock II	

Survey Area: <i>South Boston Waterfront</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Northern end of channel between Legal Sea Foods HQ and Dry Dock II</i> - <i>Steel, wooden bulkheads, wooden pilings</i> - <i>Algae</i>
	- <i>Northern side of channel between Legal Sea Foods HQ and Dry Dock II</i> - <i>Wooden bulkhead, wood pilings, concrete slabbing</i> - <i>Algae, barnacles</i>

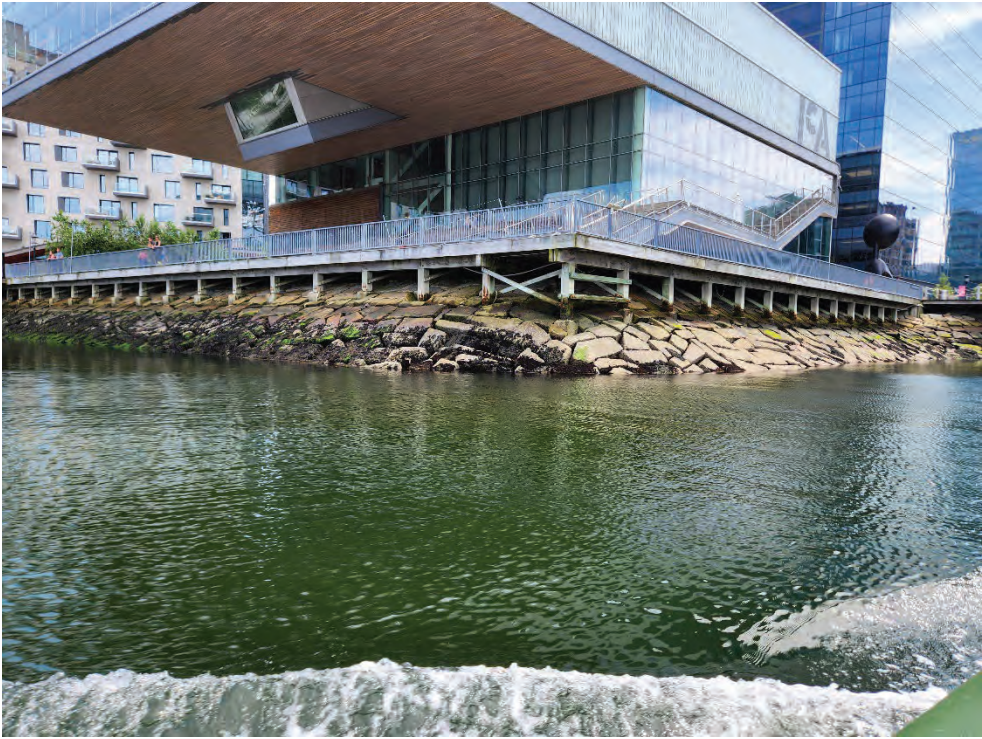
Survey Area: <i>South Boston Waterfront</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Channel between Dry Dock II and Fish Pier</i> - <i>Steel bulkhead, wood pilings, concrete/rebar slabbing</i> - <i>Algae, barnacles</i>
	- <i>End of channel between Dry Dock II and Fish Pier</i> - <i>Stone seawall/ retaining wall</i> - <i>Algae and macroalgae</i>

Survey Area: <i>South Boston Waterfront</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>End of channel between Dry Dock II and Fish Pier</i> - <i>Steel bulkhead</i> - <i>Stone seawall and rock piles</i> - <i>Drainage pipes</i> - <i>Concrete pilings</i>
	- <i>Channel between Dry Dock II and Fish Pier facing the Fish Pier</i> - <i>Stone seawall</i> - <i>Algae and macroalgae</i>

Survey Area: <i>South Boston Waterfront</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Channel between Fish Pier and Commonwealth Pier</i> - <i>Concrete, steel pilings</i>
	- <i>End of channel between Fish Pier and Commonwealth Pier</i> - <i>Stone seawall</i> - <i>drainage pipes</i> - <i>Algae, macroalgae, and barnacles</i>

Survey Area: <i>South Boston Waterfront</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Channel between Fish Pier and Commonwealth Pier facing the Fish Pier</i> - <i>Stone seawall/ bulkhead</i>
	- <i>Channel Commonwealth Pier and Pier 4, facing Pier 4</i> - <i>Stone seawall</i> - <i>Algae, marcoalgae, and barnacles</i>

Survey Area:	South Boston Waterfront	Date: 8/9/2023
Image	Description	
	- End of channel between Commonwealth Pier and Pier 4 - Steel bulkhead, pilings - Barnacles	
	- Southern side of Fan Pier marina - Stone seawall and rip-rap - Algae and macroalgae	

Survey Area: <i>South Boston Waterfront</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Fan Pier marina, Institute of Contemporary Art</i> - <i>Stone reventment with wood deck supports</i> - <i>Algae and macroalgae</i>
	- <i>Northern side of Fan Pier marina</i> - <i>Steel bulkhead and pilings</i> - <i>Floating docks</i>

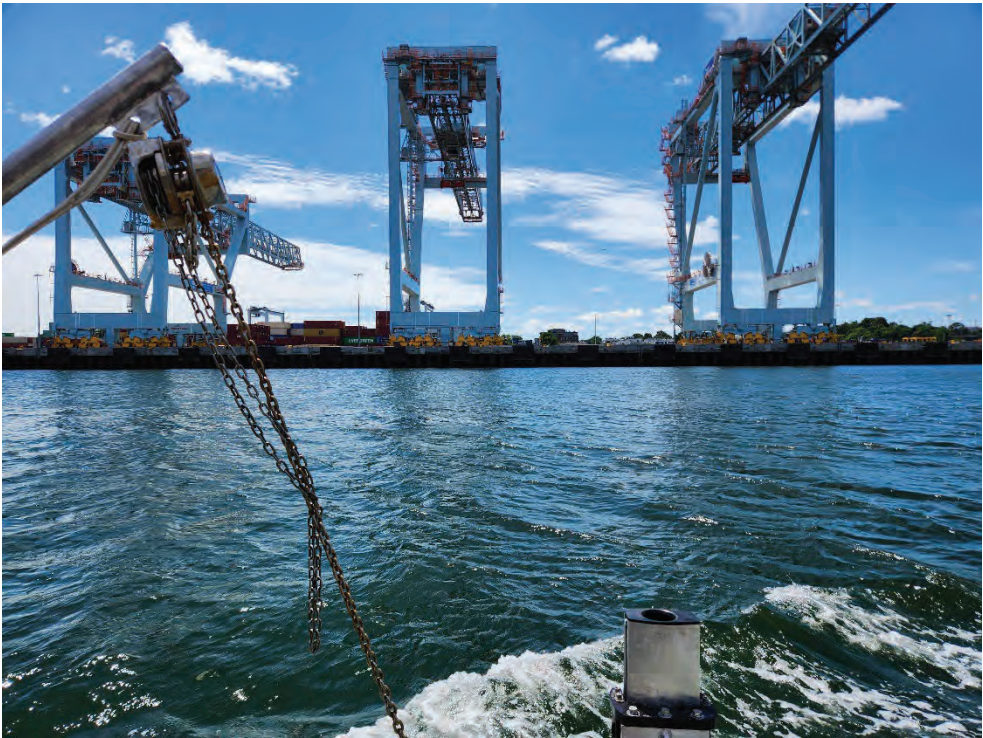
Survey Area:	Date:
<i>South Boston Waterfront – Dry Dock</i>	<i>8/9/2023</i>
Image	Description
	- <i>Southern side of Boston Dry Dock III Channel</i> - <i>Wood pilings and bulkhead</i>
	- <i>End of Boston Dry Dock III Channel</i> - <i>Steel and wooden bulkheads</i> - <i>Wood pilings, concrete supports</i> - <i>Stone rip-rap</i> - <i>Algae and macroalgae</i>

Survey Area:	Date:
South Boston Waterfront – Dry Dock	8/9/2023
Image	Description
	- End of Boston Dry Dock III Channel - Steel and wooden bulkheads - Wood pilings, concrete supports - Stone rip-rap - Algae and macroalgae - Upland vegetation (Drydock Green Space park)
	- End of Boston Dry Dock III Channel - Stone seawall - Decaying concrete pilings, wood pilings - Dry dock water discharge pipe

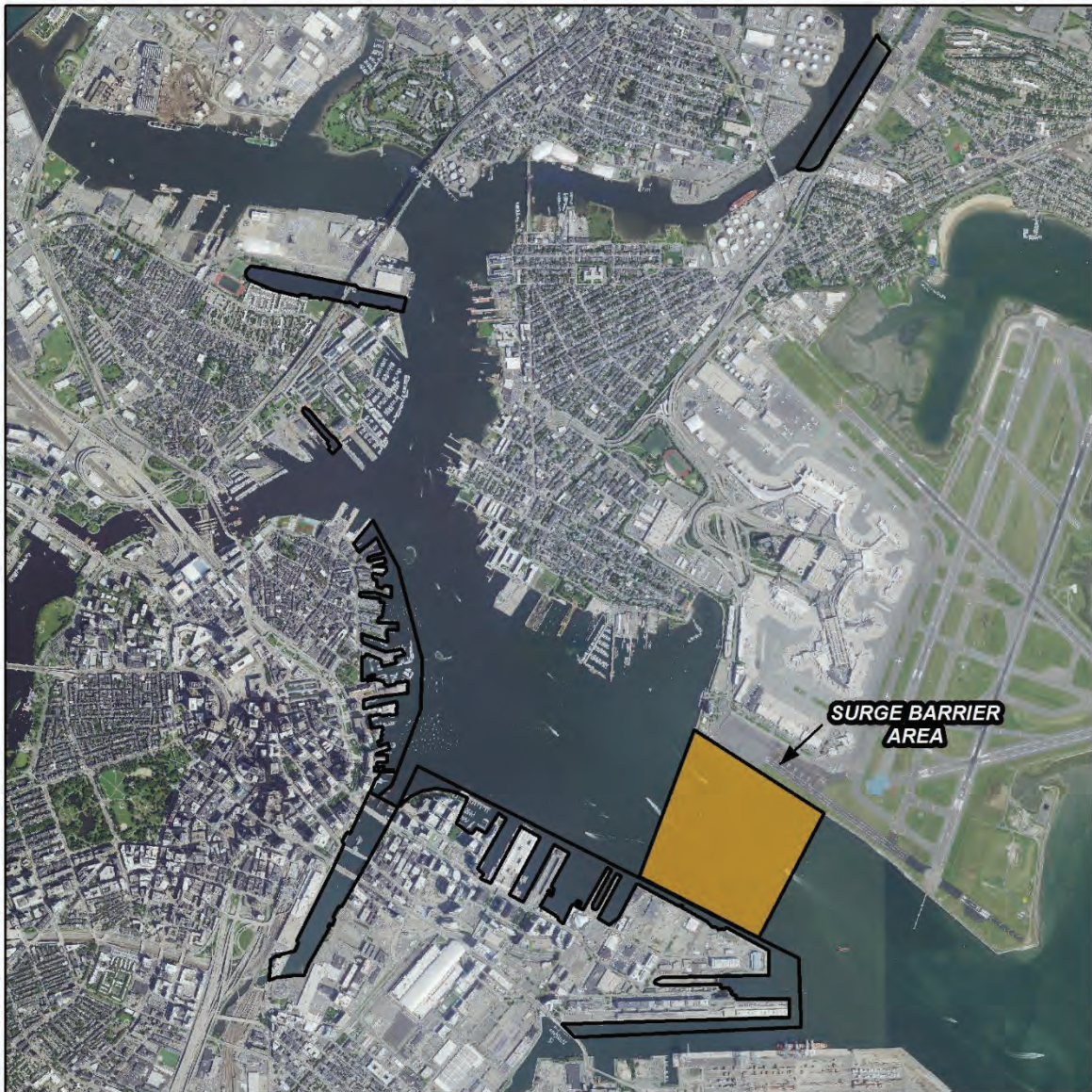
Survey Area:	Date:
South Boston Waterfront – Dry Dock	8/9/2023
Image	Description
	- End of Boston Dry Dock III Channel - Stone seawall - Metal dry dock gate with wooden supports - Macroalgae
	- Northern side of Boston Dry Dock III Channel - Decomposing concrete pilings, bulkhead, blocks, and slabs - Wood and steel pilings - Stone slabs - Upland vegetation - Barnacles, algae, macroalgae

Survey Area: <i>South Boston Waterfront – Dry Dock / Reserved Channel</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Northern side of Boston Dry Dock III Channel</i> - <i>Decomposing concrete pilings, bulkhead, blocks, and slabs</i> - <i>Wood and steel pilings</i> - <i>Stone slabs</i> - <i>Crumbling concrete landing</i> - <i>Upland vegetation</i> - <i>Barnacles, algae</i>
	- <i>Reserved Channel entrance facing the northern shoreline</i> - <i>Wood/concrete pilings</i> - <i>Algae, macroalgae, and barnacles</i>

Survey Area:	South Boston Waterfront – Reserved Channel	Date: 8/9/2023
Image	Description	
	- Reserved Channel facing the northern shoreline - Wood pilings and bulkhead - Concrete support structures - Algae	
	- Reserved Channel northern shoreline - Beneath the pier, adjacent to wooden bulkhead	

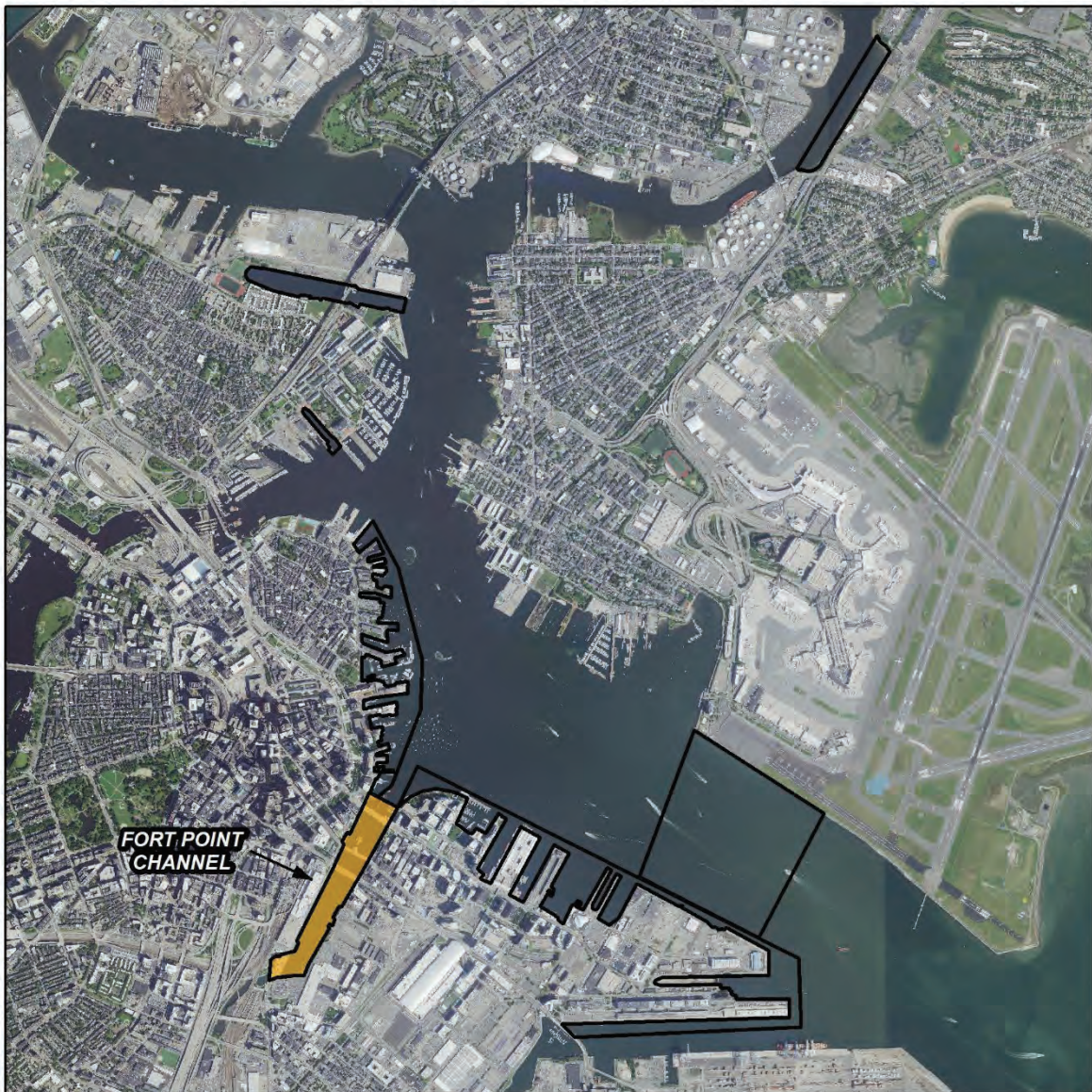
Survey Area:	South Boston Waterfront – Reserved Channel	Date: 8/9/2023
Image	Description	
	- End of the Reserved Channel - Concrete bridge supports	
	- Reserved Channel southern shoreline - Conley Container Terminal cargo cranes - Concrete pilings and concrete structures	

BOSTON HARBOR - SURGE BARRIER



Survey Area: <i>Boston Harbor Surge Barrier</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Logan Airport southern shoreline</i> - <i>Stone seawall</i> - <i>Algae and macroalgae</i>
	- <i>Logan Airport southern shoreline</i> - <i>Stone seawall</i> - <i>Approach Light Line Pier seen in the distance</i>

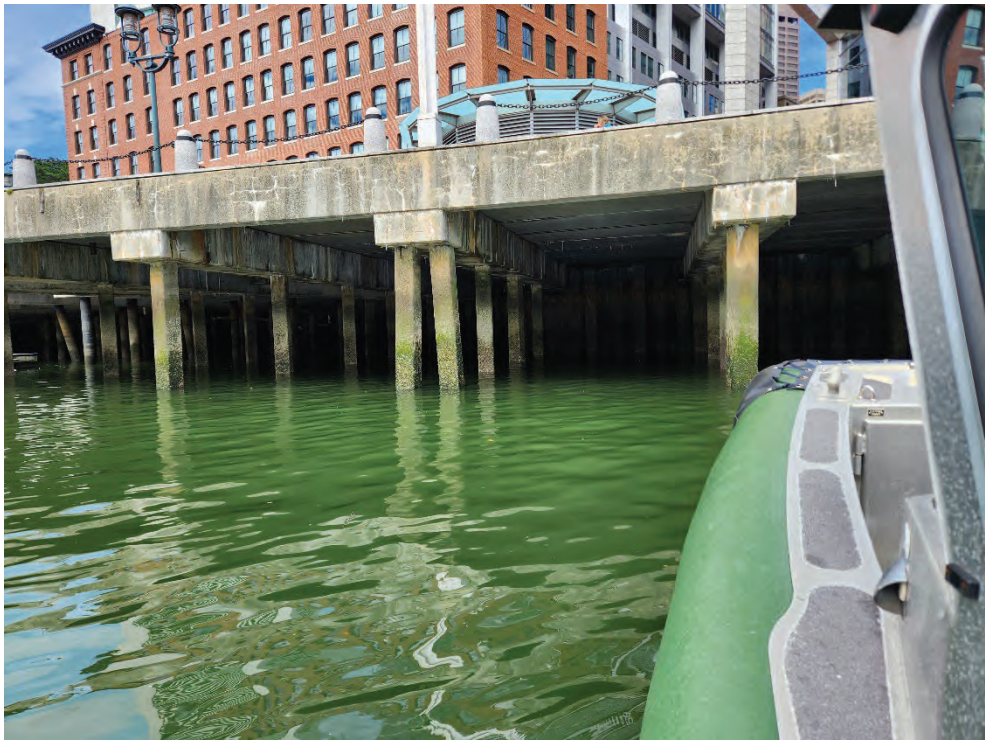
BOSTON HARBOR - FORT POINT CHANNEL



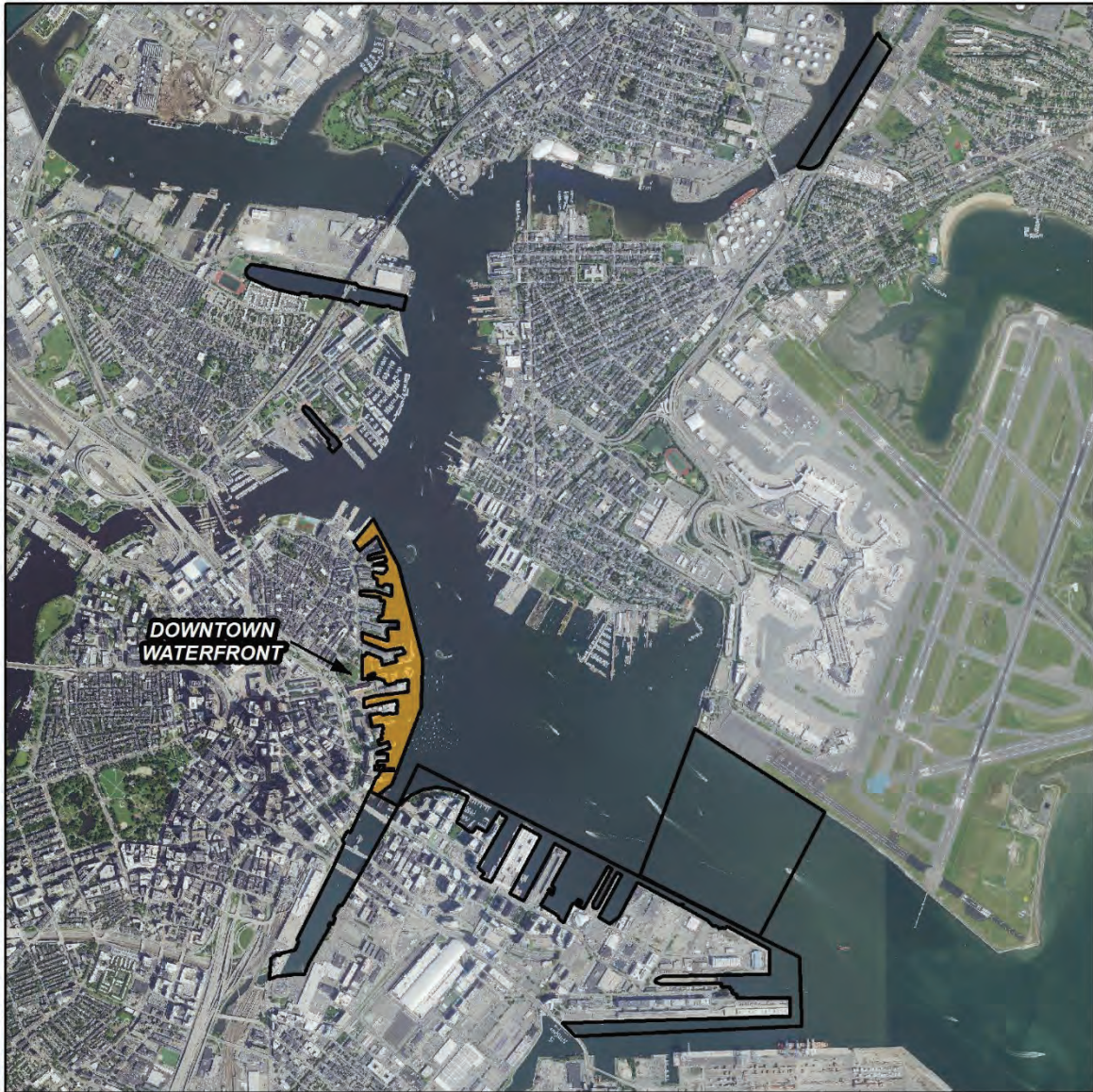
Survey Area:	Fort Point Channel	Date: 8/9/2023
Image	Description	
	- Fort Point Channel facing the Downtown shoreline - Stone seawall - Algae and macroalgae	
	- End of the Fort Point Channel facing the South Boston shoreline - Gillette World Shaving Headquarters - Steel piling-supported concrete slab walkways - Stone seawall - Algae, macroalgae, and barnacles	

Survey Area: <i>Fort Point Channel</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>End of the Fort Point Channel</i> - <i>Stone rip-rap and seawall</i> - <i>Drainage pipe</i> - <i>Macroalgae spp.</i>
	- <i>Fort Point Channel facing the South Boston shoreline</i> - <i>Stone seawall</i> - <i>Cobble beach</i> - <i>Macroalgae and algae</i> - <i>CSO BOS072 station visible in distance</i> - <i>Upland vegetation</i>

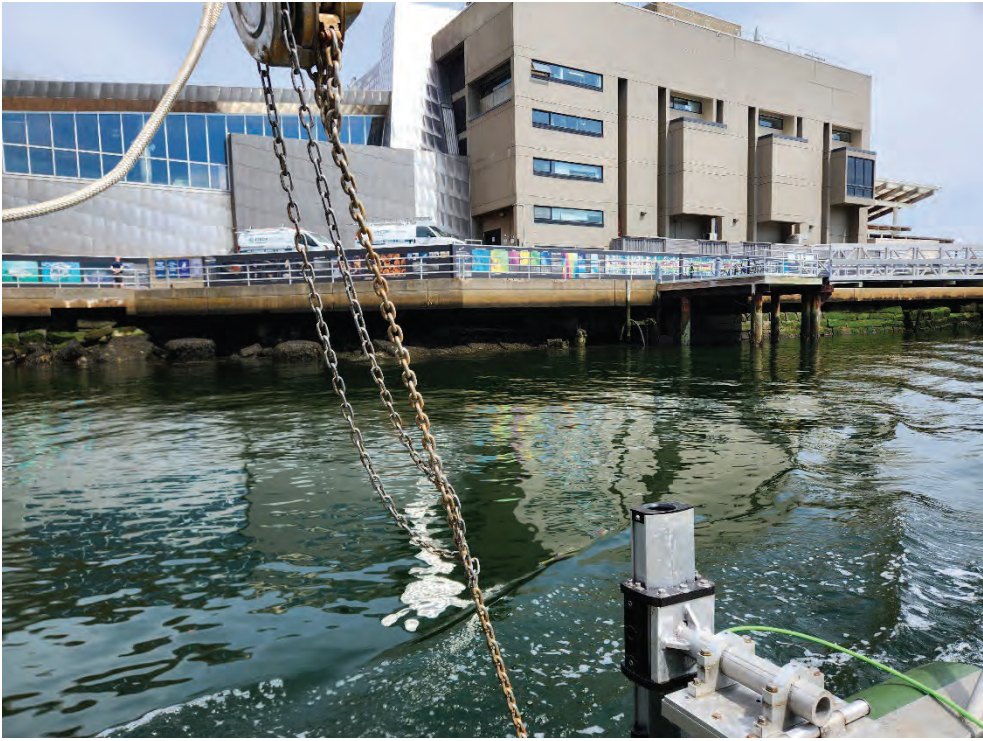
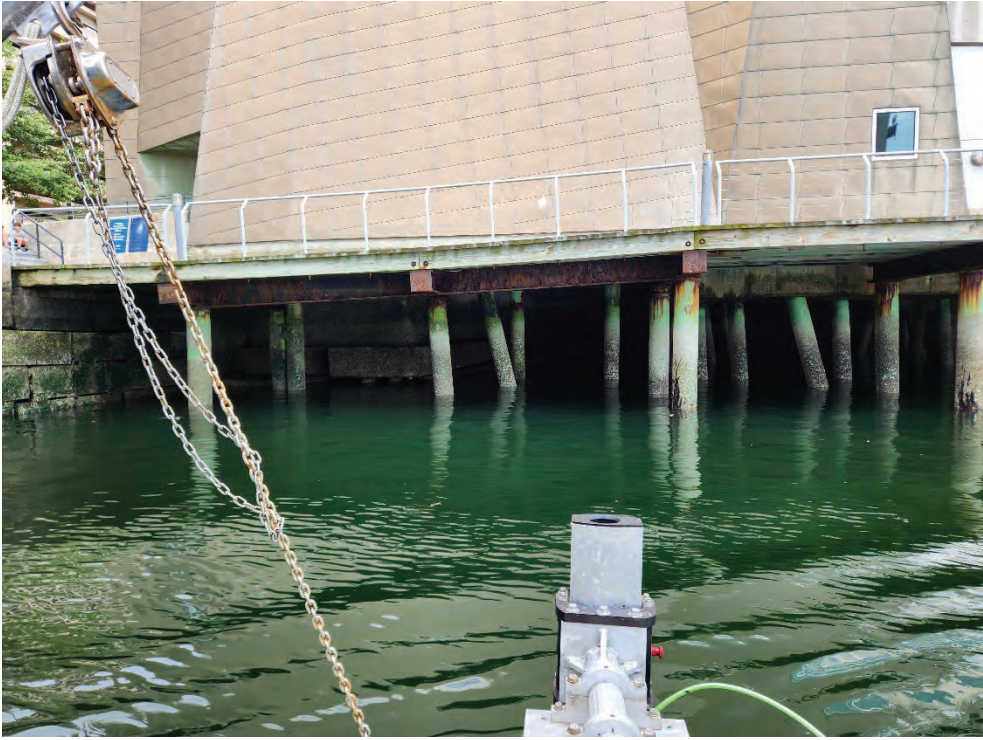
Survey Area: <i>Fort Point Channel</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Fort Point Channel facing the Downtown shoreline</i> - <i>Wood and concrete piling supported, developed shoreline</i> - <i>Steel bulkhead underneath</i>
	- <i>Fort Point Channel facing the Downtown shoreline</i> - <i>Wood pilings</i> - <i>Wood structures encasing bridge piers</i>

Survey Area: <i>Fort Point Channel</i>	Date: <i>8/9/2023</i>
Image	Description
	- <i>Fort Point Channel facing the Downtown shoreline</i> - <i>Concrete piles with steel bulkhead underneath</i> - <i>Barnacles and algae</i>
	- <i>Fort Point Channel entrance facing the South Boston shoreline</i> - <i>Derelict bridge structures</i> - <i>Barnacles, macroalgae</i>

BOSTON HARBOR - DOWNTOWN WATERFRONT



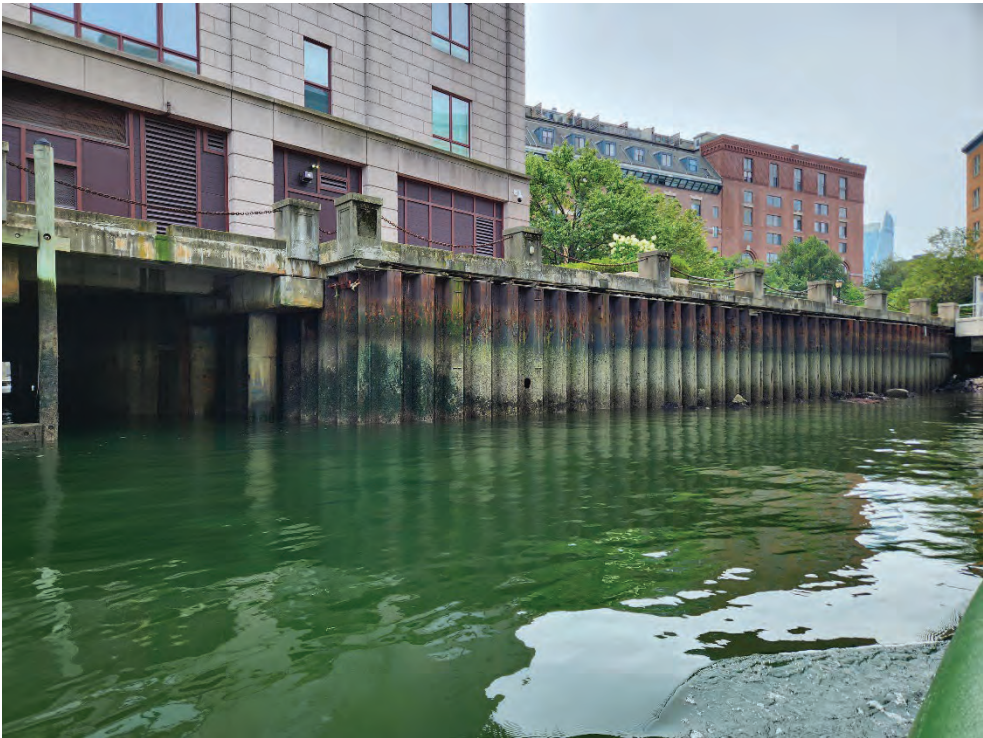
Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Rowes Wharf</i> - <i>Developed, residential shoreline</i> - <i>Concrete piling supported wharf</i> - <i>Stone seawall</i> - <i>Macroalgae and barnacles</i>
	- <i>Rowes Wharf</i> - <i>Stone seawall</i> - <i>Macroalgae and barnacles</i> <i>* This characterizes most of the non-piling supported piers and shoreline</i>

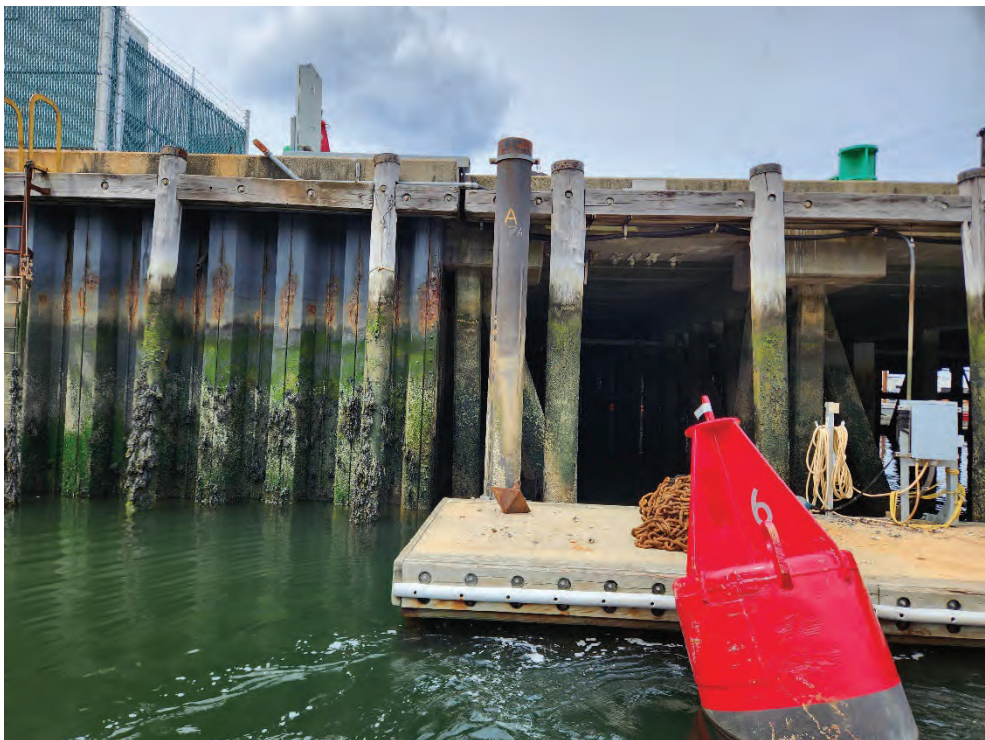
Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>New England Aquarium, Central Wharf</i> - <i>Stone rip rap and seawall</i> - <i>Wooden piling supports, concrete structures</i> - <i>Macroalgae</i> <i>*Aquarium intake pipe ~150 feet off the end of central wharf</i>
	- <i>New England Aquarium, Central Wharf</i> - <i>Stone seawall</i> - <i>Steel pilings and beams</i> - <i>Barnacles</i>

Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Marriot Hotel, Long Wharf</i> - <i>Stone seawall</i> - <i>Rocky/cobbly area with emergent drainage pipes</i> - <i>Macroalgae</i>
	- <i>Commercial Wharf</i> - <i>Stone seawall</i> - <i>Wooden piling supports</i>

Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Channel between Commercial Wharf and Lewis Wharf</i> - <i>Stone seawall</i> - <i>Wooden pilings supporting Harborwalk</i> - <i>Algae, macroalgae, and barnacles</i>
	- <i>End of Lewis Wharf</i> - <i>Derelict wooden pilings</i>

Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Pilot House Park, Lewis Wharf</i> - <i>Stone rip-rap and seawall</i> - <i>Drainage pipe</i> - <i>Algae and macroalgae</i>
	- <i>Union Wharf</i> - <i>Stone seawall</i> - <i>Pipe infrastructure</i> - <i>Algae and macroalgae</i> <i>*Channel is located directly over Sumner and Callahan Tunnels</i>

Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Burroughs Wharf</i> - <i>Concrete piling supported pier</i> - <i>Algae, barnacles, macroalgae</i>
	- <i>Burroughs Wharf</i> - <i>Steel sheetpile bulkhead</i> - <i>Concrete piling supported pier</i> - <i>Algae and macroalgae</i>

Survey Area: <i>Downtown Waterfront</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>U.S. Coast Guard Station</i> - <i>Concrete slab pier</i> - <i>Steel sheetpile bulkhead</i> - <i>Wooden pilings</i> - <i>Algae and macroalgae</i>
	- <i>U.S. Coast Guard Station</i> - <i>Steel piling-supported concrete slab walkways</i> - <i>Stone seawall</i> - <i>Algae and barnacles</i>

BOSTON HARBOR – CHARLESTOWN NAVY YARD



Survey Area: <i>Charlestown Navy Yard</i>		Date: <i>8/10/2023</i>
Image	Description	
	- <i>Entrance of dry dock 2, northern shoreline</i> - <i>Piling-supported concrete slab pier</i> - <i>Concrete bulkhead</i> - <i>Water taxi dock at Charlestown Navy Yard Ferry Terminal</i> - <i>Algae and macroalgae</i>	
	- <i>Entrance of dry dock 2, southern shoreline</i> - <i>Piling-supported concrete slab pier</i> - <i>Concrete bulkhead</i> - <i>Algae and macroalgae</i>	

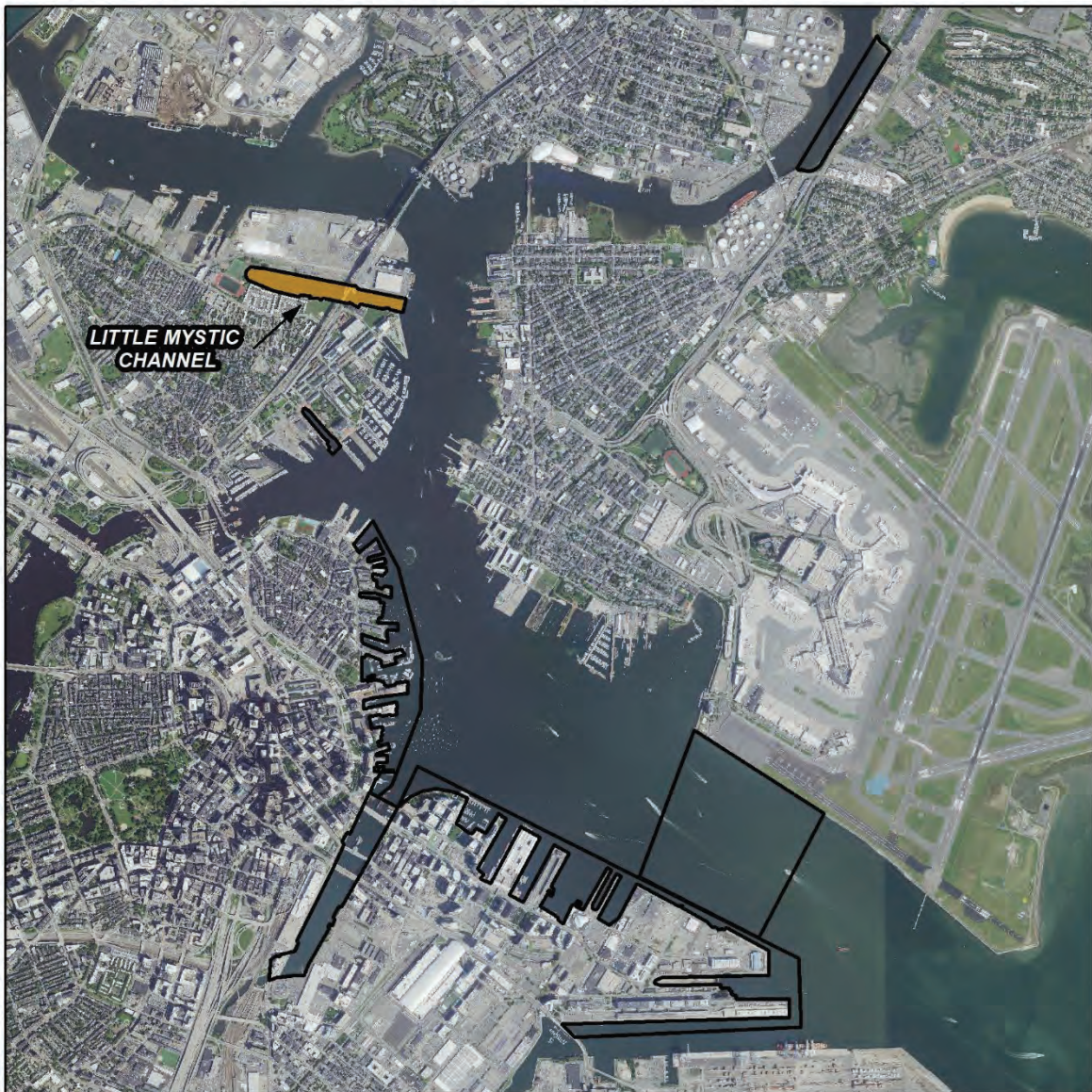
Survey Area: <i>Charlestown Navy Yard</i>		Date: <i>8/10/2023</i>
Image		Description
		- <i>Dry dock 2 interior, southern shoreline</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>
		- <i>Dry dock 2 interior, southern shoreline</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>

Survey Area: <i>Charlestown Navy Yard</i>		Date: <i>8/10/2023</i>
Image	Description	
	- <i>Dry dock 2 interior, northern shoreline</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>	
	- <i>Dry dock 2 interior, northern shoreline</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>	

Survey Area: <i>Charlestown Navy Yard</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Dry dock 2 interior, northern shoreline</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>
	- <i>Dry dock 2 interior, head/southern shoreline</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>

Survey Area: <i>Charlestown Navy Yard</i>		Date: <i>8/10/2023</i>
Image	Description	
	- <i>Dry dock 2 interior, head</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>	
	- <i>Dry dock 2 interior, looking toward entrance</i> - <i>Stone dry dock wall</i> - <i>Algae and macroalgae</i>	

BOSTON HARBOR – LITTLE MYSTIC CHANNEL



Survey Area: <i>Little Mystic Channel</i>	Date: 8/7/2023
Image	Description
	- <i>Little Mystic Channel facing the southern shoreline</i> - <i>Developed, residential area</i> - <i>Sheetpile bulkhead and stone seawall</i> - <i>Apartment building complex</i>
	- <i>Little Mystic Channel facing the southern shoreline</i> - <i>Sheetpile bulkhead and stone seawall</i> - <i>Landscaped upland vegetation</i>

Survey Area: <i>Little Mystic Channel</i>	Date: <i>8/7/2023</i>
Image	Description
	- <i>Little Mystic Channel facing the northern shoreline</i> - <i>Stone seawall</i> - <i>Macroalgae and upland vegetation</i> - <i>Chelsea Street and Tobin Bridges</i>
	- <i>Little Mystic Channel facing the northern shoreline</i> - <i>Stone seawall</i> - <i>Entrance to boat ramp</i> - <i>Macroalgae</i>

BOSTON HARBOR - CHELSEA RIVER

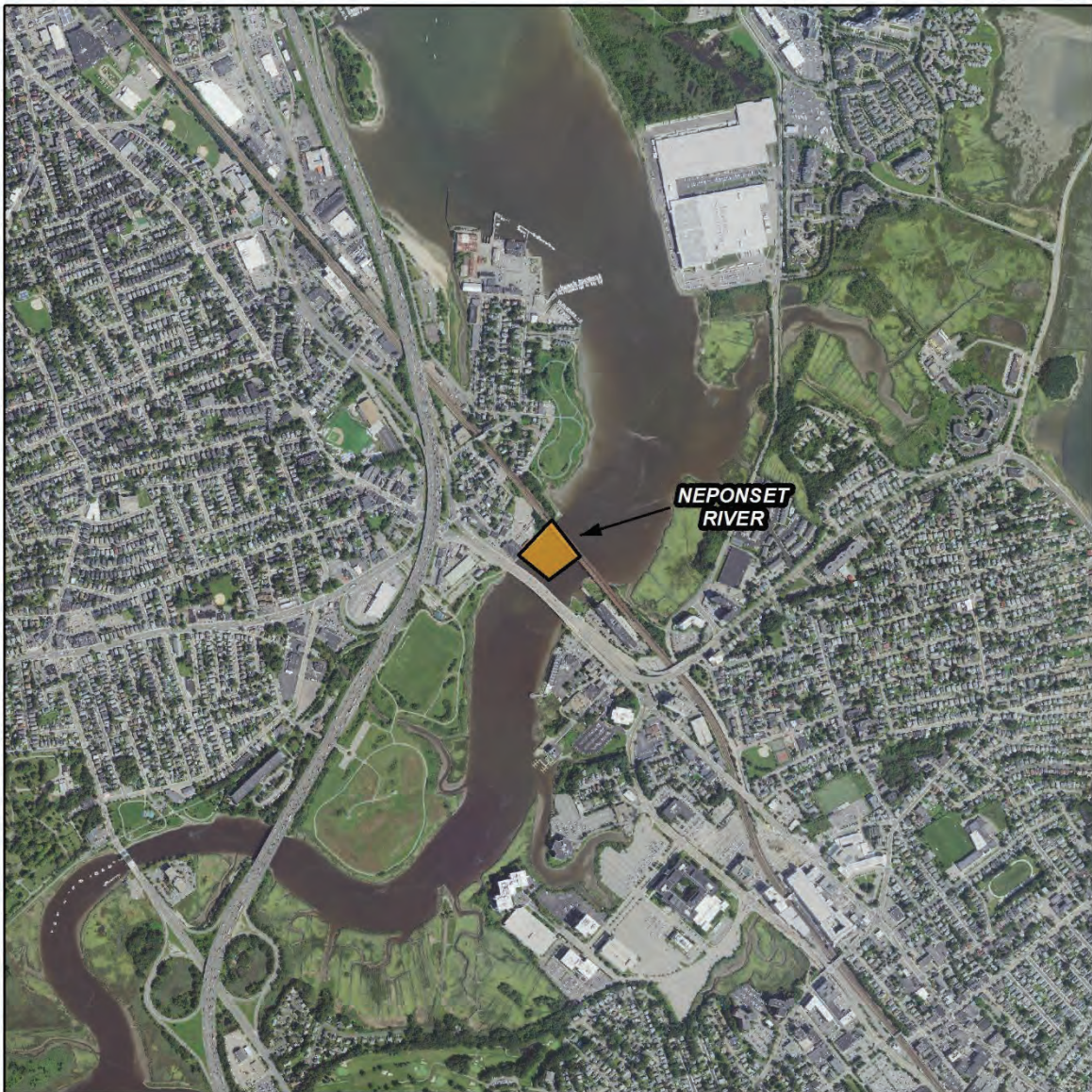


Survey Area: <i>Chelsea River</i>	Date: <i>8/7/2023</i>
Image	Description
 A wide-angle photograph of the Chelsea River. The water is calm and reflects the overcast sky. In the background, a long, low shoreline is visible, featuring a mix of industrial buildings, a cobble beach, and a piling-supported bulkhead. The sky is filled with heavy, grey clouds.	- <i>Chelsea River facing the Chelsea shoreline</i> - <i>Piling-supported shoreline</i> - <i>Bulkhead and rock retention wall</i> - <i>Cobble beach</i>
 A photograph taken from a boat, looking across the Chelsea River. In the foreground, a metal chain hangs from a pulley. The river is calm, reflecting the sky. In the background, an industrial area is visible, featuring several large white and black storage tanks, a building with a 'Gulf' logo, and a piling-supported bulkhead. The sky is overcast.	- <i>Chelsea River facing the Chelsea shoreline</i> - <i>Bulkhead and piling-supported shoreline</i> - <i>Industrial area with fuel storage tanks</i>

Survey Area: <i>Chelsea River</i>	Date: <i>8/7/2023</i>
Image	Description
	- <i>Chelsea River facing the East Boston shoreline</i> - <i>Stone seawall</i> - <i>Marine debris</i> - <i>Sandy/gravelly/cobbly beach</i> - <i>Upland vegetation</i>
	- <i>Chelsea River facing the East Boston shoreline</i> - <i>Rocky shoreline</i> - <i>Derelict pilings</i> - <i>Barnacles</i> - <i>Upland vegetation</i>

Survey Area: <i>Chelsea River</i>	Date: 8/7/2023
Image	Description
	- <i>Chelsea River facing the East Boston shoreline</i> - <i>Rocky shoreline</i> - <i>Driftwood and marine debris</i> - <i>Marsh grass</i> - <i>Upland vegetation</i>
	- <i>Chelsea River facing the East Boston shoreline</i> - <i>Abandoned industrial building</i> - <i>Stone bulkhead/ seawall</i> - <i>Algae & macroalgae</i>

NEPONSET RIVER



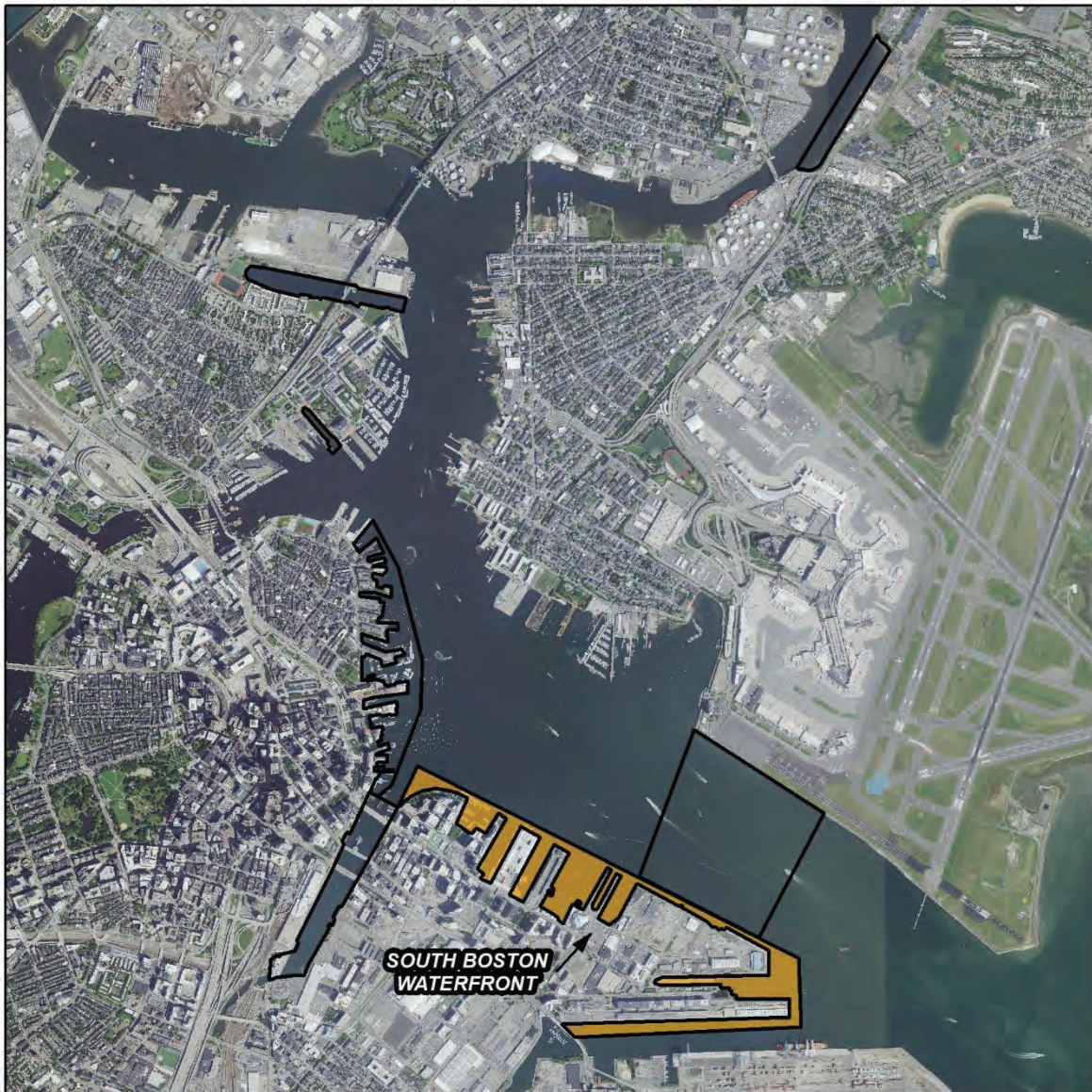
Survey Area: <i>Neponset River</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Western shoreline, Neponset Trail</i> - <i>Concrete slab walkway and support structure forward of stone seawall</i> - <i>Derelict wood pilings</i> - <i>Algae & macroalgae</i>
	- <i>Western shoreline, Neponset Trail and Planet Fitness building</i> - <i>Concrete slab walkway and support structure forward of stone seawall</i> - <i>Derelict wood pilings and sheetpile section</i> - <i>Drainage outfall</i> - <i>Stone and concrete pier of Neponset Bridge</i> - <i>Algae & macroalgae</i>

Survey Area: <i>Neponset River</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Western shoreline, Neponset Trail and Planet Fitness building</i> - <i>Concrete slab walkway and support structure forward of stone seawall</i> - <i>Drainage outfalls</i> - <i>Stone and concrete piers of Neponset Bridge</i> - <i>Algae and macroalgae</i>
	- <i>Western shoreline, Neponset Trail and Planet Fitness building</i> - <i>Neponset Bridge structure</i> - <i>Rip rap seawall</i>

Survey Area: <i>Neponset River</i>	Date: <i>8/10/2023</i>
Image	Description
	- <i>Western shoreline, Neponset Trail and Planet Fitness building</i> - <i>Concrete slab walkway and support structure forward of stone seawall</i> - <i>Drainage outfalls</i> - <i>Stone and concrete piers of Neponset Bridge</i>
	- <i>Western shoreline, Neponset Trail and Planet Fitness building</i> - <i>Concrete slab walkway and support structure forward of stone seawall</i> - <i>Neponset-Anderson Rail Road Bridge</i>

APPENDIX B
SUBTIDAL IMAGE DATABASE

BOSTON HARBOR - SOUTH BOSTON WATERFRONT

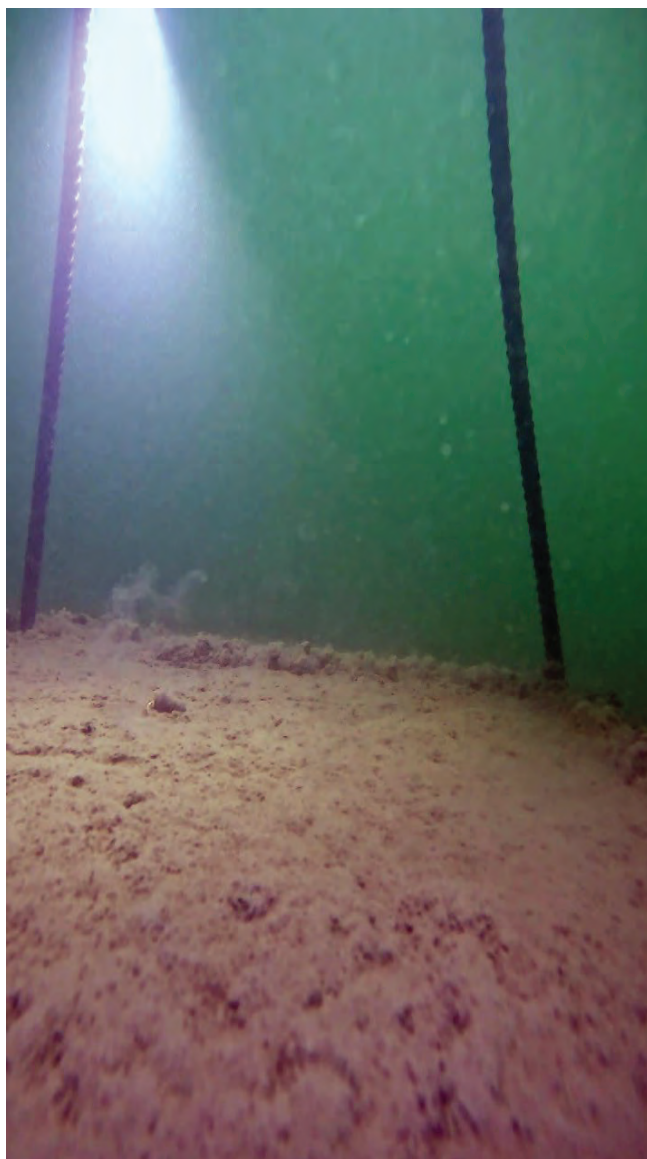


Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-1</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.349831</i>	Longitude (NAD83): <i>-71.033158</i>		Water Depth (FT):	<i>-28.3</i>

Plan View



Profile View

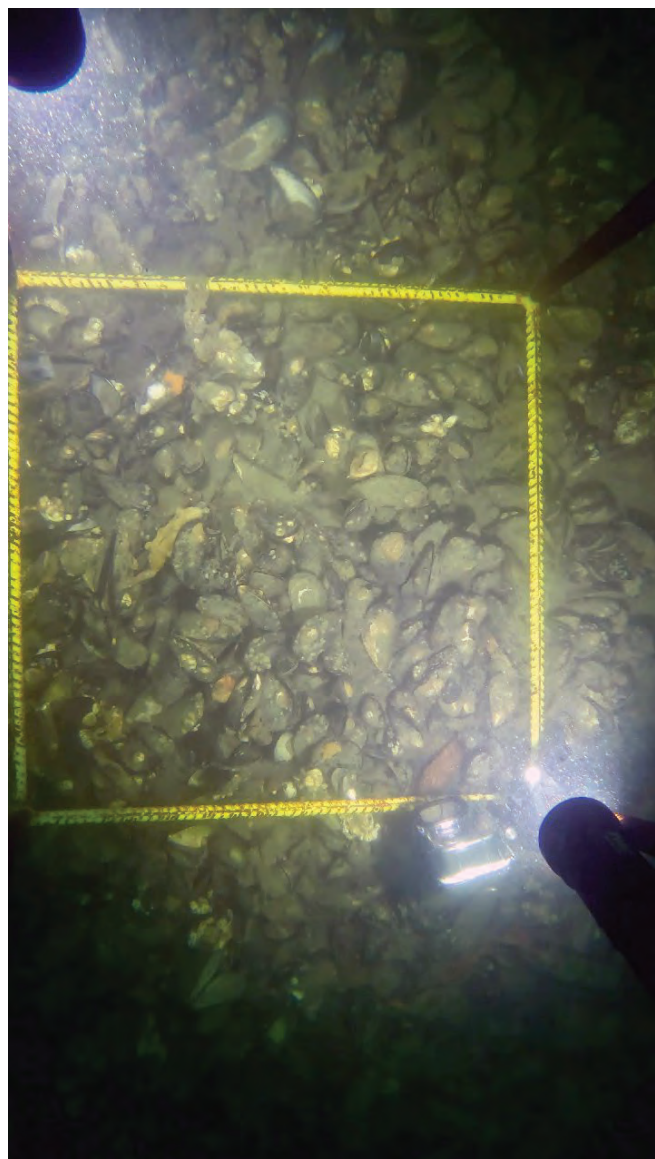


Notes:

Bare silt with small infaunal invertebrate tubes and burrows. Located between Boston Dry Dock II and the Legal Seafoods HQ.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-2</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.351144</i>	Longitude (NAD83): <i>-71.034120</i>		Water Depth (FT):	<i>-24.5</i>

Plan View



Profile View

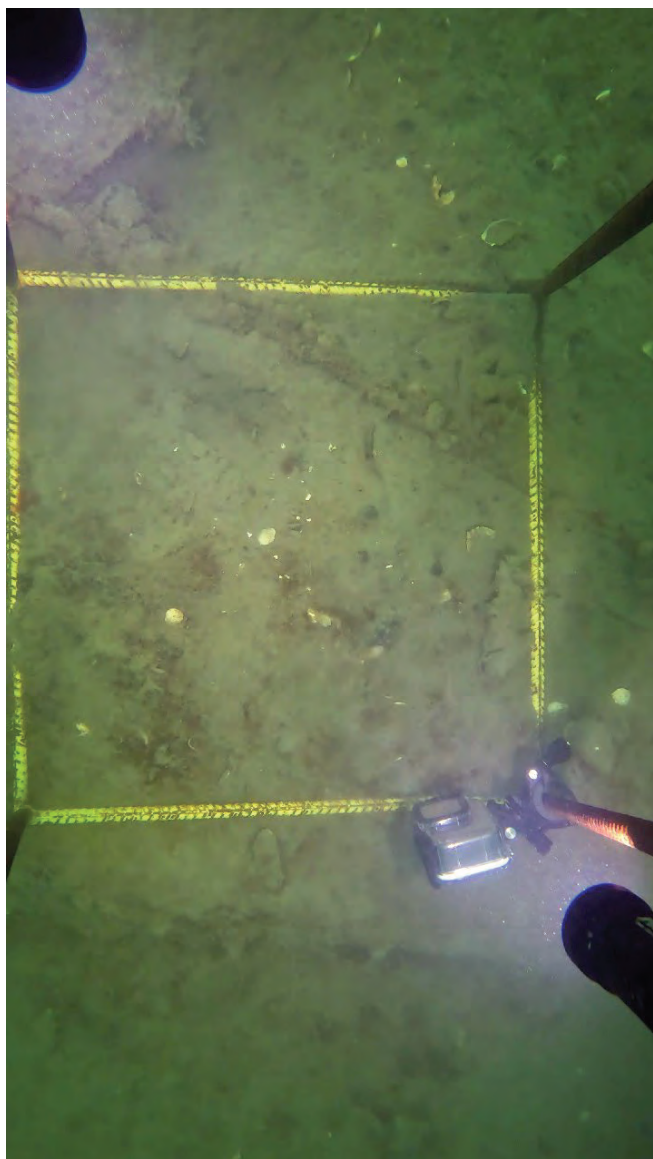


Notes:

Mussel reef with epiphytic slipper snails (Crepidula sp.) and barnacles (Balanidae spp.). Located adjacent to the western pier of Boston Dry Dock II.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-3</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.351245</i>	Longitude (NAD83): <i>-71.035258</i>		Water Depth (FT): <i>-25.2</i>	

Plan View



Profile View

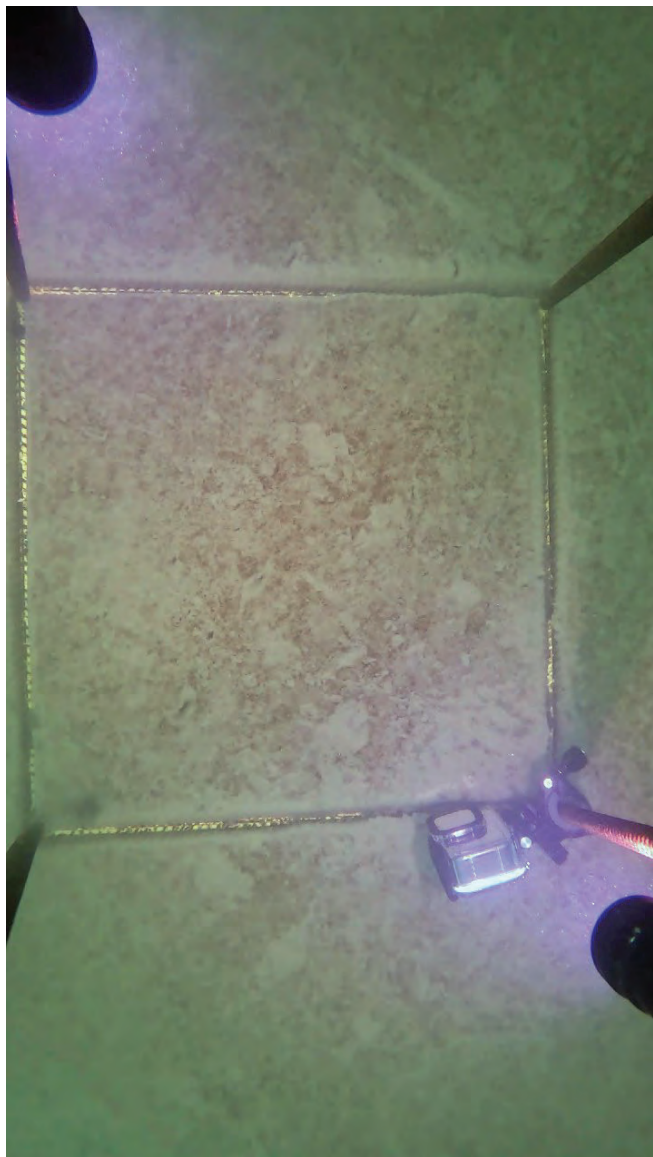


Notes:

Silt and shell rubble with anthropogenic metal and rope debris. Located between Boston Fish Pier and Boston Dry Dock III, within the footprint of a historic pier.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-4</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.350706</i>	Longitude (NAD83): <i>-71.036957</i>		Water Depth (FT): <i>-22.4</i>	

Plan View



Profile View

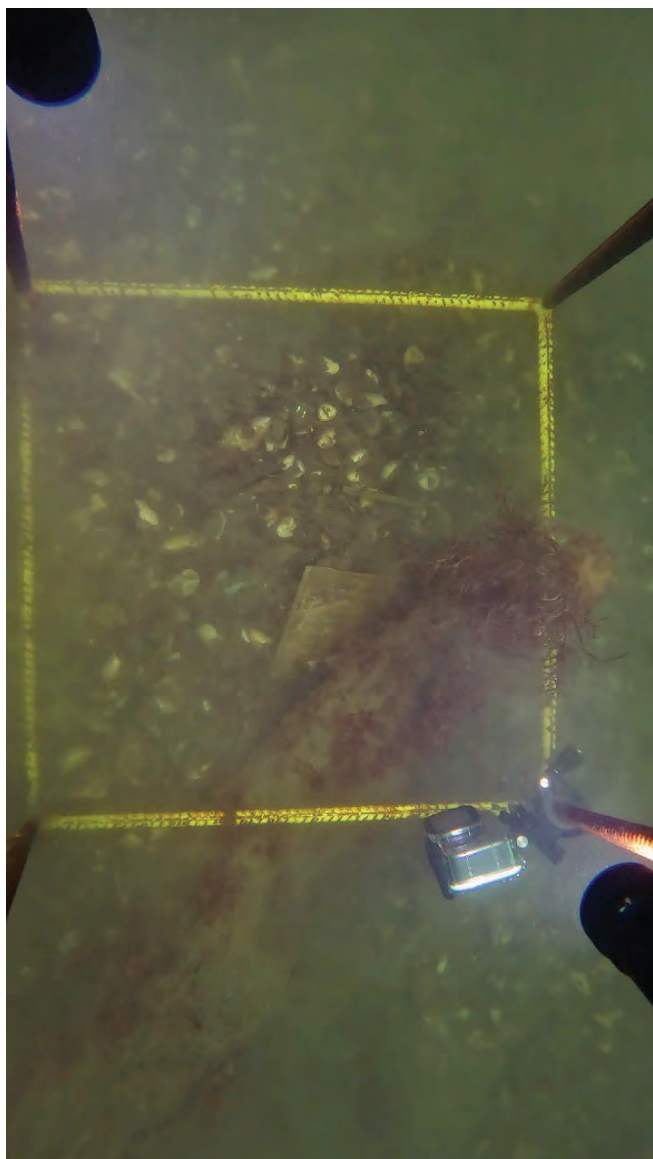


Notes:

Bare silt with a thin layer of microbial algae. Located between Boston Fish Pier and Boston Dry Dock III.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-5</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.348652</i>	Longitude (NAD83): <i>-71.037288</i>		Water Depth (FT): <i>-13.0</i>	

Plan View



Profile View

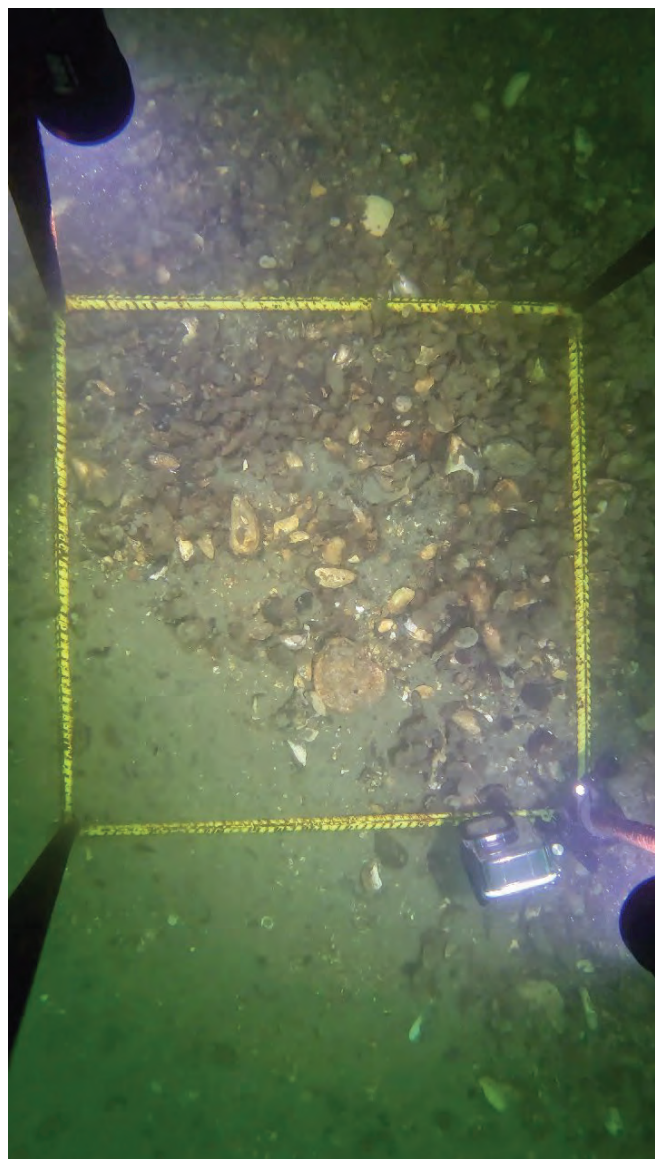


Notes:

Shell rubble with anthropogenic debris and attached filamentous macroalgae. Located between Legal Seafoods restaurant and the Leader Bank Pavillion.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-6</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.352345</i>	Longitude (NAD83): <i>-71.037725</i>		Water Depth (FT):	<i>-24.6</i>

Plan View



Profile View

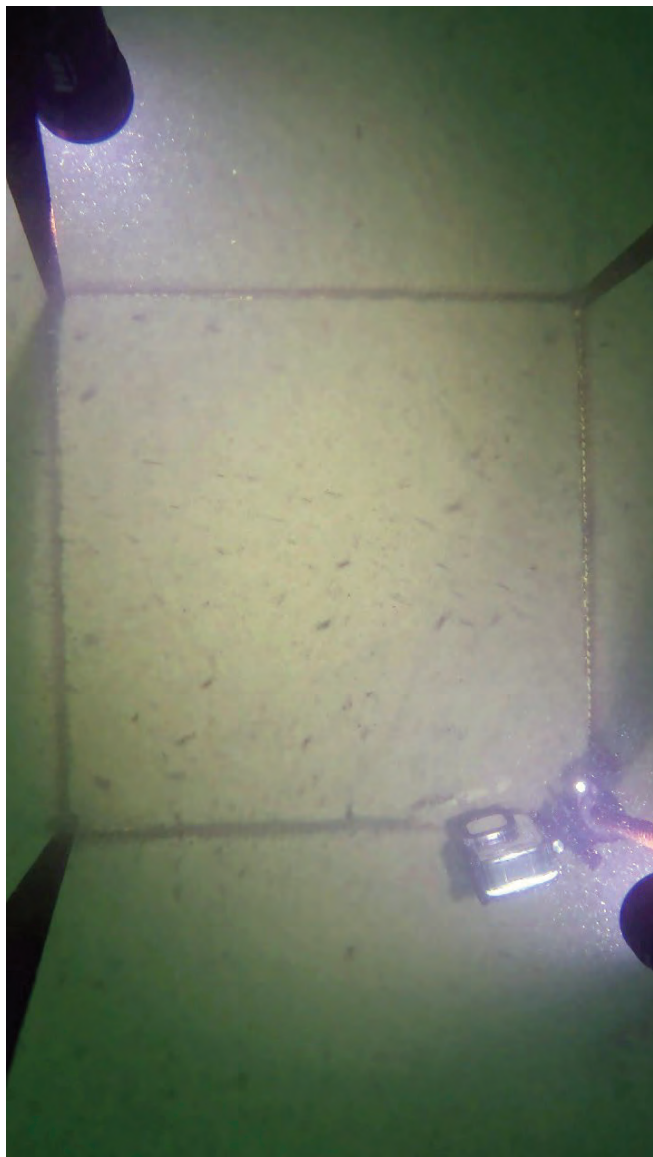


Notes:

Sand and shell rubble with a dense cover of tunicates (likely *Molgulidae* sp. or *Ascidiella aspersa*) and a sparse cover of ectoprocts and hydroids. Located adjacent to Boston Fish Pier.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-7</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.350716</i>	Longitude (NAD83): <i>-71.039607</i>		Water Depth (FT): <i>-33.3</i>	

Plan View



Profile View

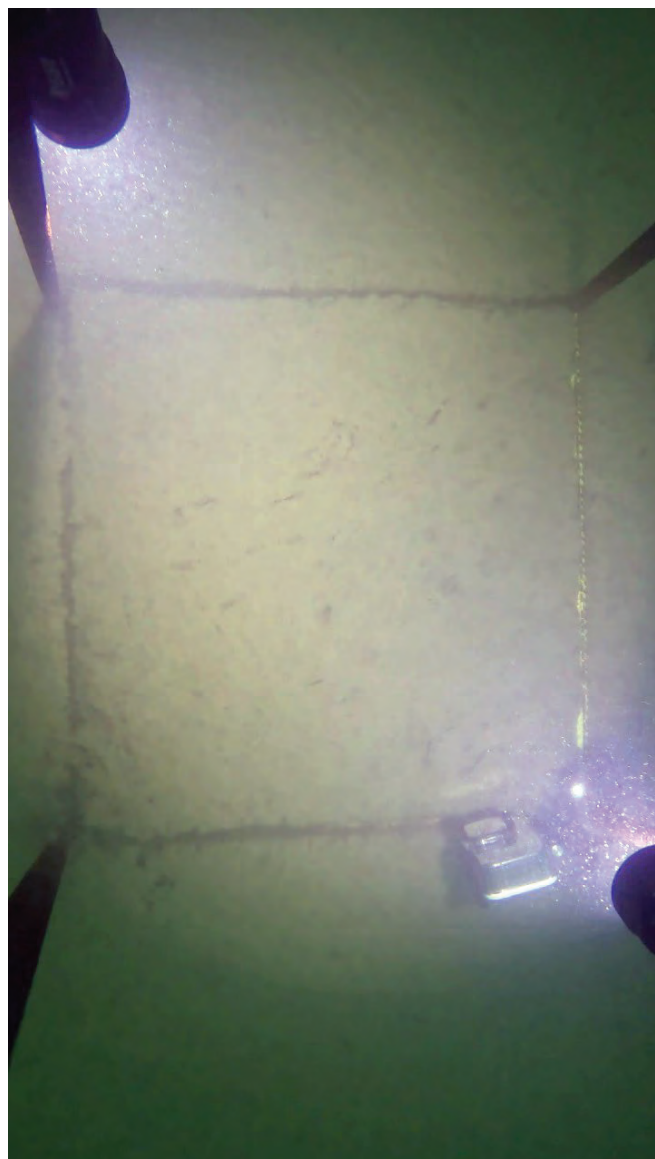


Notes:

Bare silt with infunal invertebrate tubes and burrows. Located between Commonwealth Pier and Boston Fish Pier.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-8</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.353340</i>	Longitude (NAD83): <i>-71.038951</i>		Water Depth (FT):	<i>-35.1</i>

Plan View

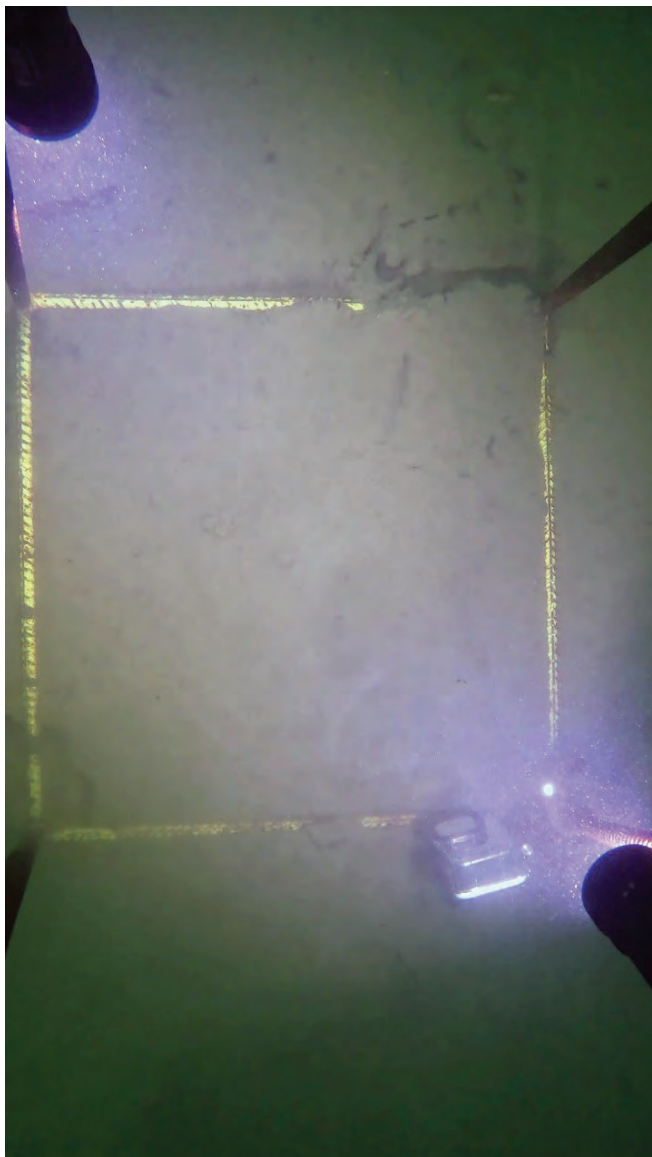
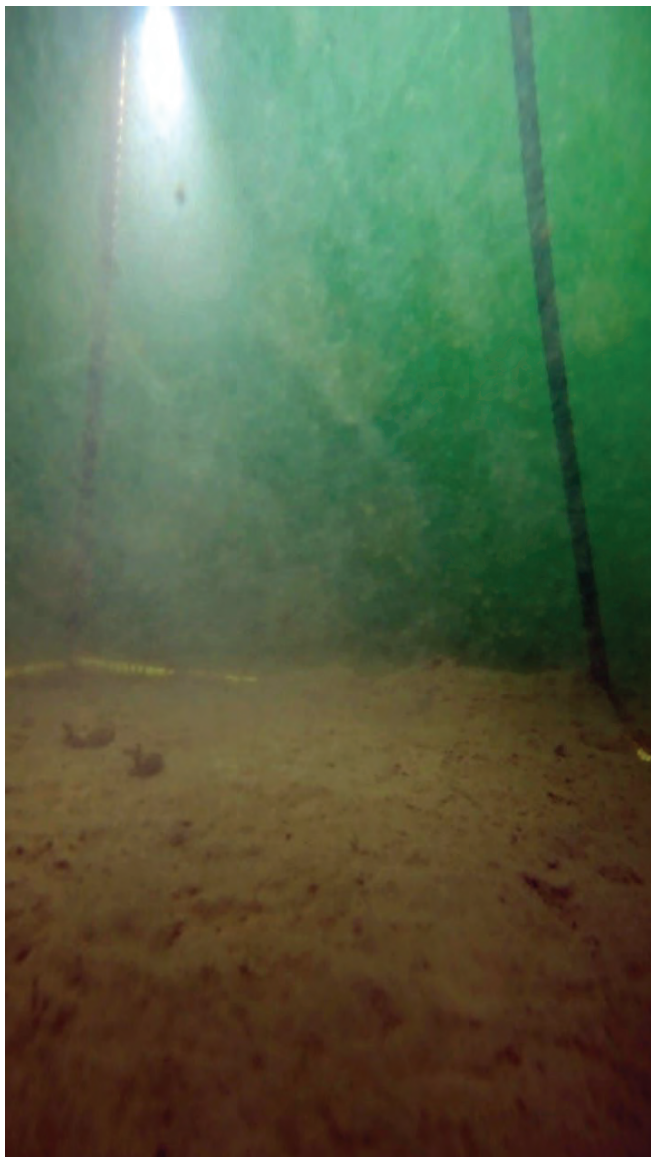


Profile View



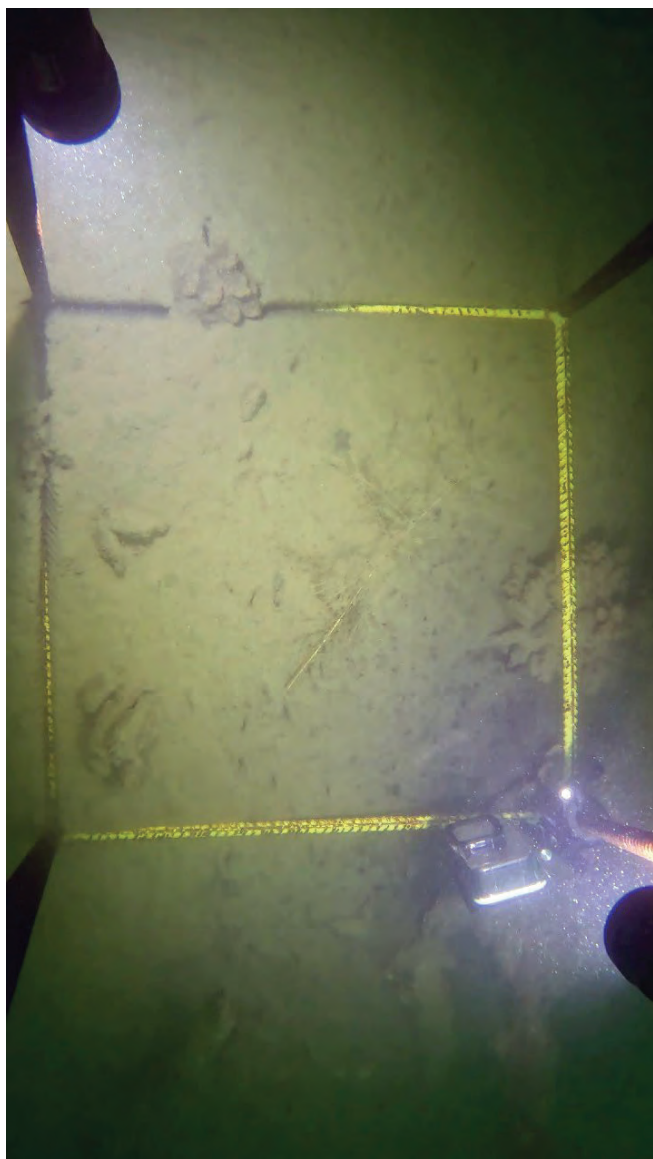
Notes:

Bare silt with infunal invertebrate tubes, burrows, and castings. Located near Commonwealth Pier.

Survey Area:		South Boston Waterfront		Station:		SB-9					
Date:		10/24/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.352435		Longitude (NAD83):		-71.040702		Water Depth (FT):		-35.5	
Plan View						Profile View					
											
Notes:											
Bare silt with infunal invertebrate tubes and burrows. Located adjacent to Commonwealth Pier.											

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-10</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.353332</i>	Longitude (NAD83): <i>-71.040628</i>		Water Depth (FT): <i>-37.4</i>	

Plan View



Profile View

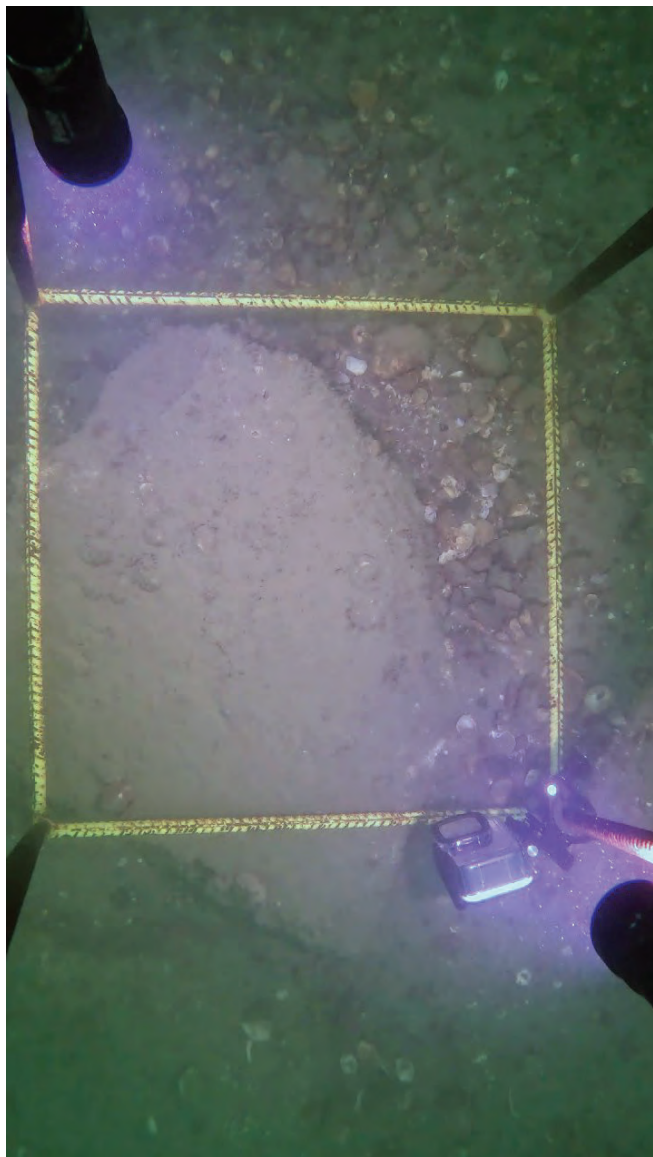


Notes:

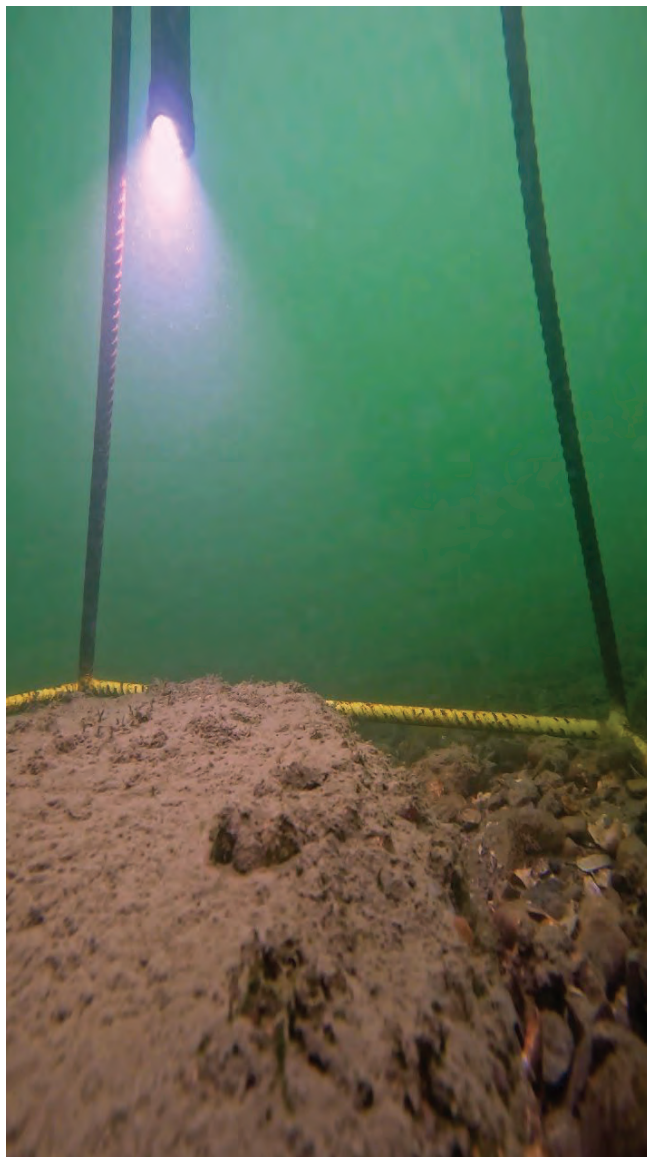
Silt with infaunal invertebrate tubes, burrows, and castings as well as (likely *Molgulidae* sp., *Styela clava*, or *Asciella aspersa*) adjacent to anthropogenic metal debris with attached tunicates. Terrestrial plant branch present in the center of the quadrat. Located between Pier 4 and Commonwealth Pier.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-11</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.355165</i>	Longitude (NAD83): <i>-71.043774</i>		Water Depth (FT): <i>-23.4</i>	

Plan View



Profile View

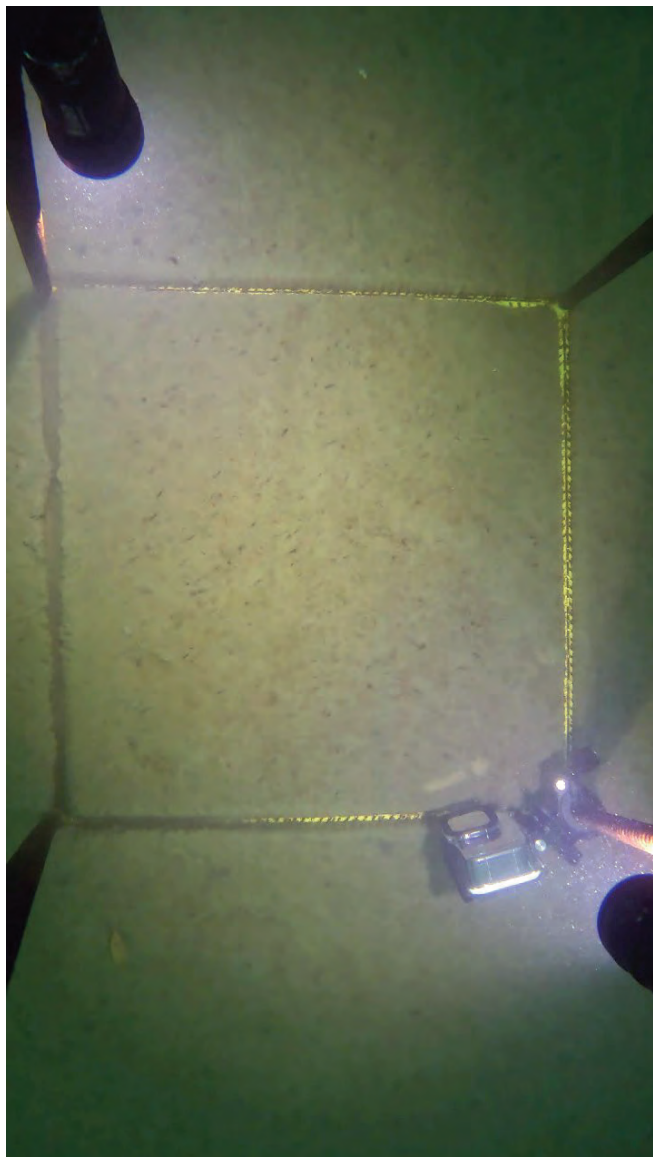


Notes:

Gravel and shell hash with a boulder in the center of the quadrat. Located near Fan Pier.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-12</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.355459</i>	Longitude (NAD83): <i>-71.044644</i>		Water Depth (FT): <i>-24.0</i>	

Plan View



Profile View

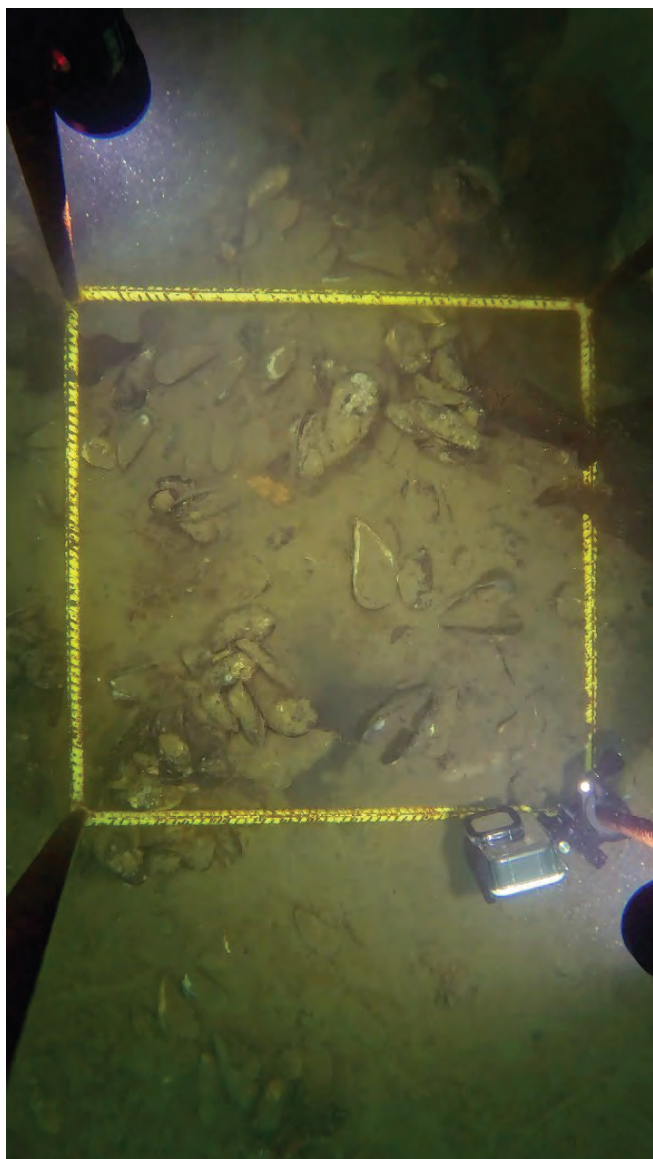


Notes:

Bare silt with infaunal invertebrate tubes, burrows, and castings. Located near Fan Pier.

Survey Area: <i>South Boston Waterfront</i>			Station: <i>SB-13</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.355243</i>	Longitude (NAD83): <i>-71.045759</i>		Water Depth (FT): <i>-16.2</i>	

Plan View

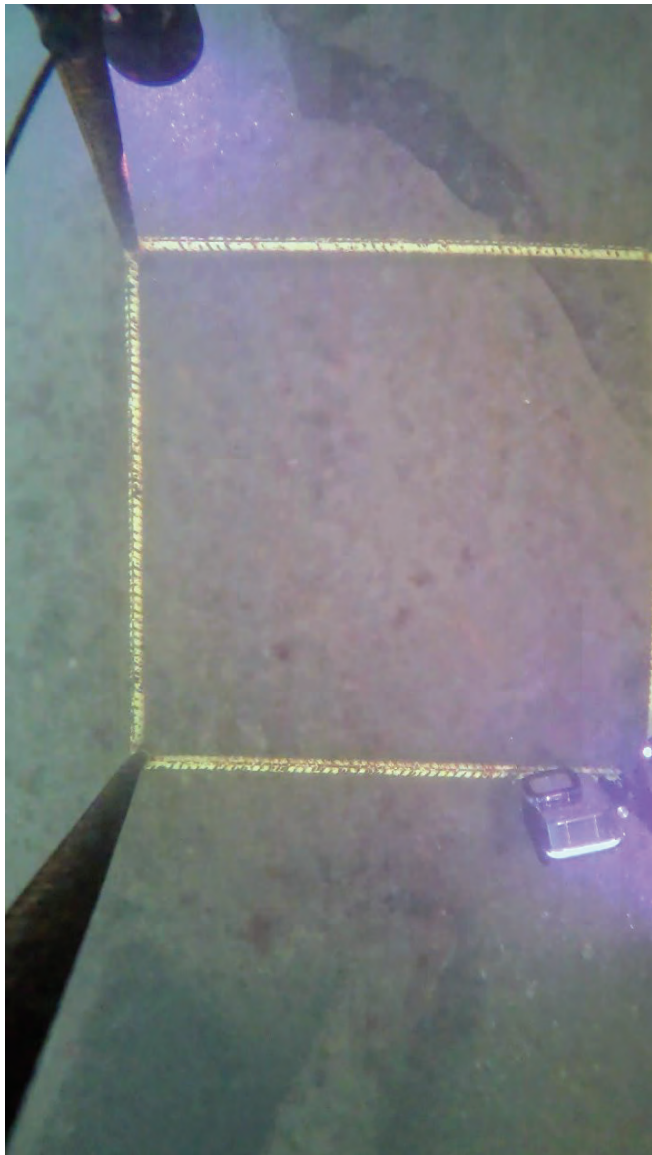


Profile View

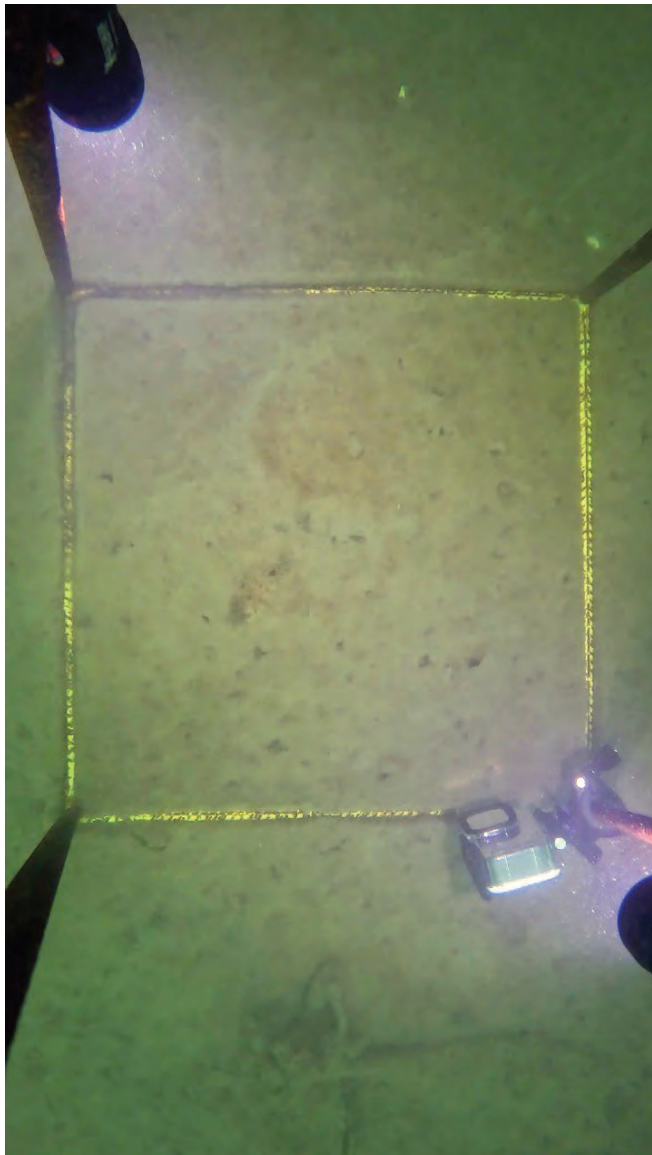


Notes:

Silt with shell rubble and attached kelp. Located near Fan Pier.

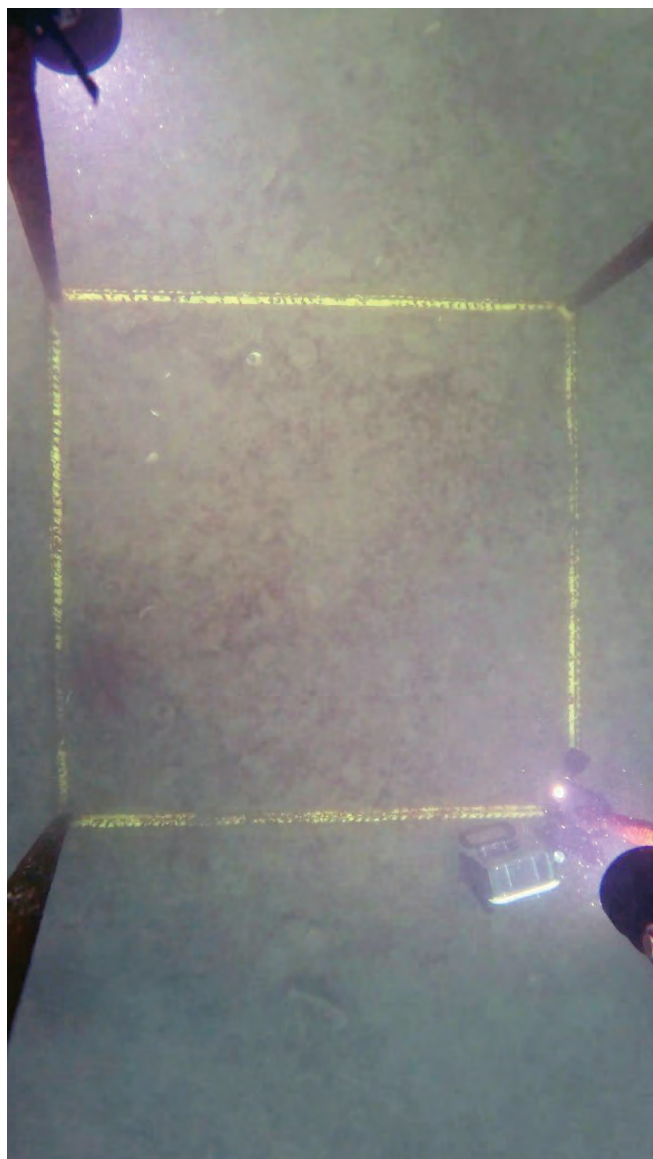
Survey Area:		South Boston Waterfront		Transect:		SB-14		Capture:		01	
Date:		10/24/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):			
42.355409, -71.046470				42.355407, -71.046486				-21.1			
Plan View						Profile View					
											
Notes:											
Sunken barge with attached ectoprocts, hydroids, and mixed macroalgae (including kelp). Located near Fan Pier, in front of the Federal Courthouse.											

Survey Area:		South Boston Waterfront		Transect:		SB-14		Capture:		02	
Date:		10/24/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):			
42.355409, -71.046470				42.355407, -71.046486				-21.1			
Plan View						Profile View					
											
Notes:											
Sunken barge with attached ectoprocts (<i>Bugula</i> sp.), hydroids, solitary tunicates (<i>Styela clava</i>), encrusting tunicates (<i>Didemnum</i> sp.), and encrusting sponges (<i>Halichondria panicea</i>). Located near Fan Pier, in front of the Federal Courthouse.											

Survey Area:		South Boston Waterfront		Transect:		SB-14		Capture:		03	
Date:		10/24/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):			
42.355409, -71.046470				42.355407, -71.046486				-21.3			
Plan View						Profile View					
											
Notes:											
Silt with invertebrate tubes and burrows. Ambient seafloor adjacent to the sunken barge. Anthropogenic debris visible in plan-view image. Located near Fan Pier, in front of the Federal Courthouse.											

Survey Area: <i>South Boston – Reserved Channel</i>			Station: <i>SB-15</i>		
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>		Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.342188</i>		Longitude (NAD83): <i>-71.035435</i>		Water Depth (FT): <i>-7.5</i>	

Plan View



Profile View

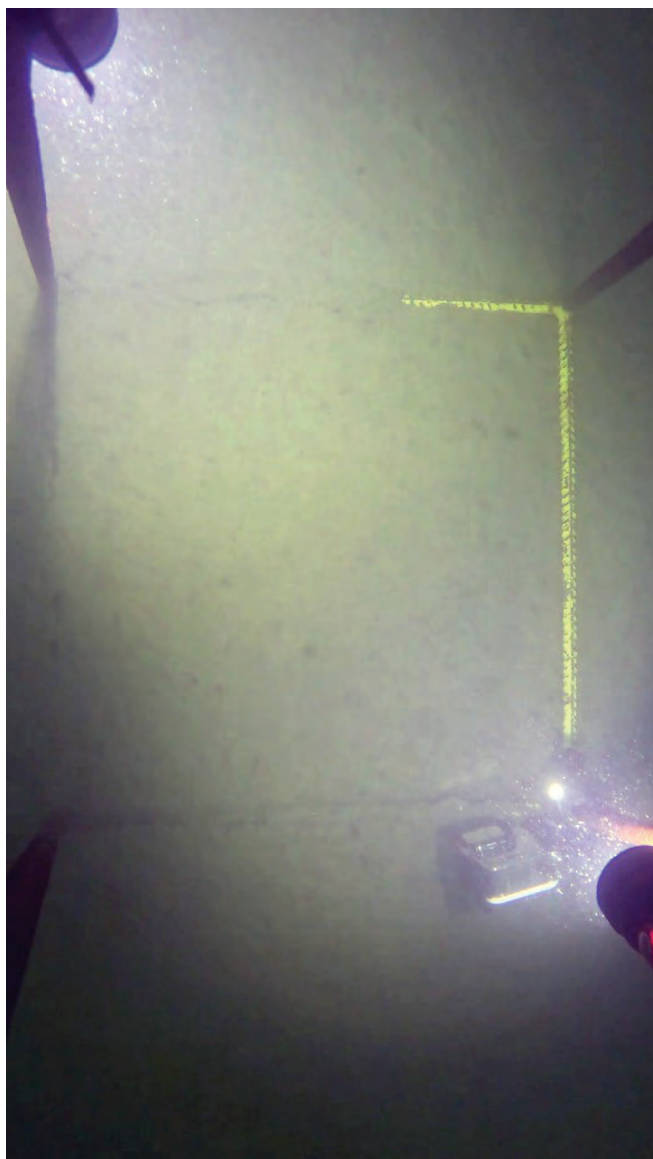


Notes:

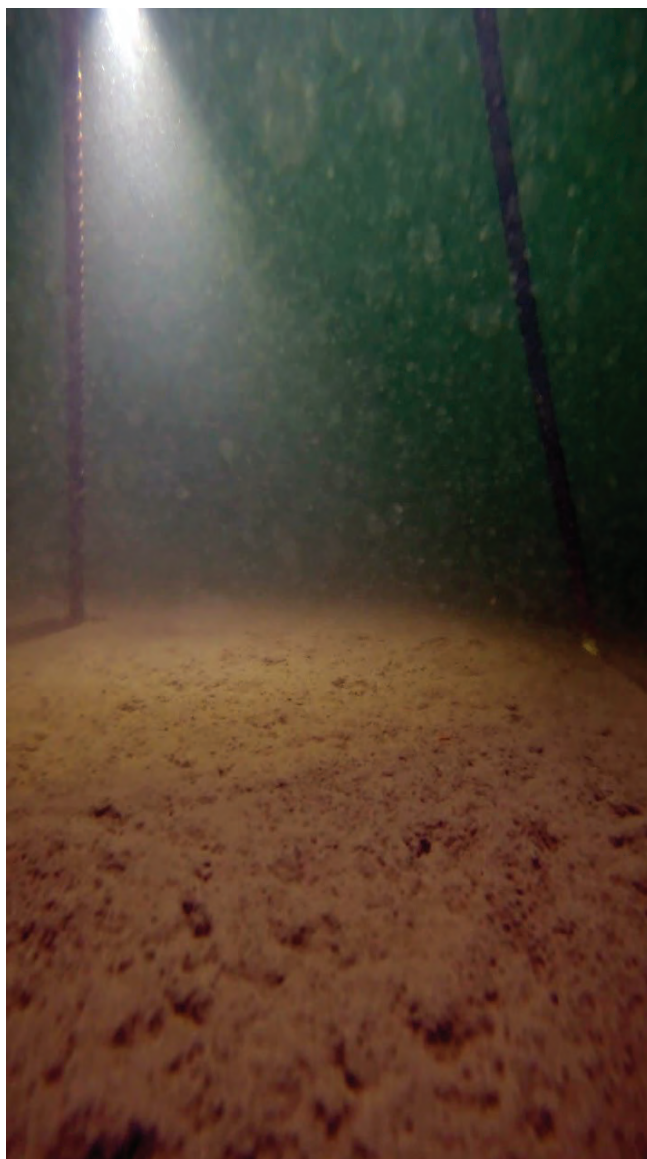
Silty sand with shell hash/rubble. Located on the western end of the Reserved Channel, adjacent to the Summer Street Bridge, outside of the federal channel.

Survey Area: <i>South Boston – Reserved Channel</i>			Station: <i>SB-16</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.342757</i>	Longitude (NAD83): <i>-71.034740</i>		Water Depth (FT): <i>-36.4</i>	

Plan View



Profile View

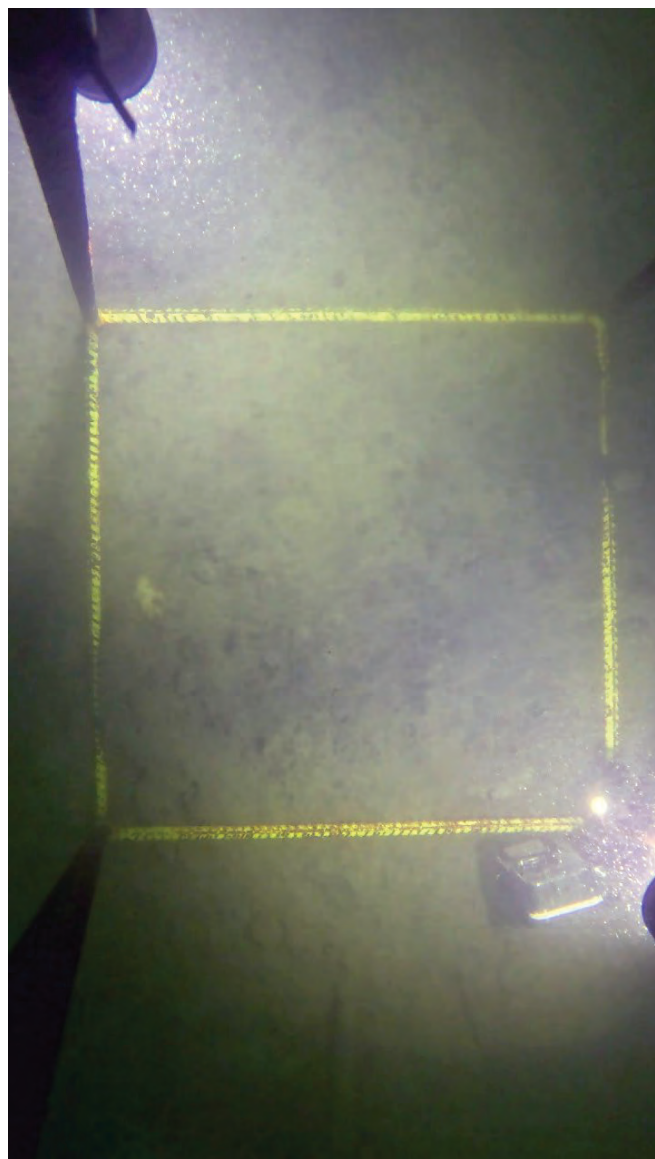


Notes:

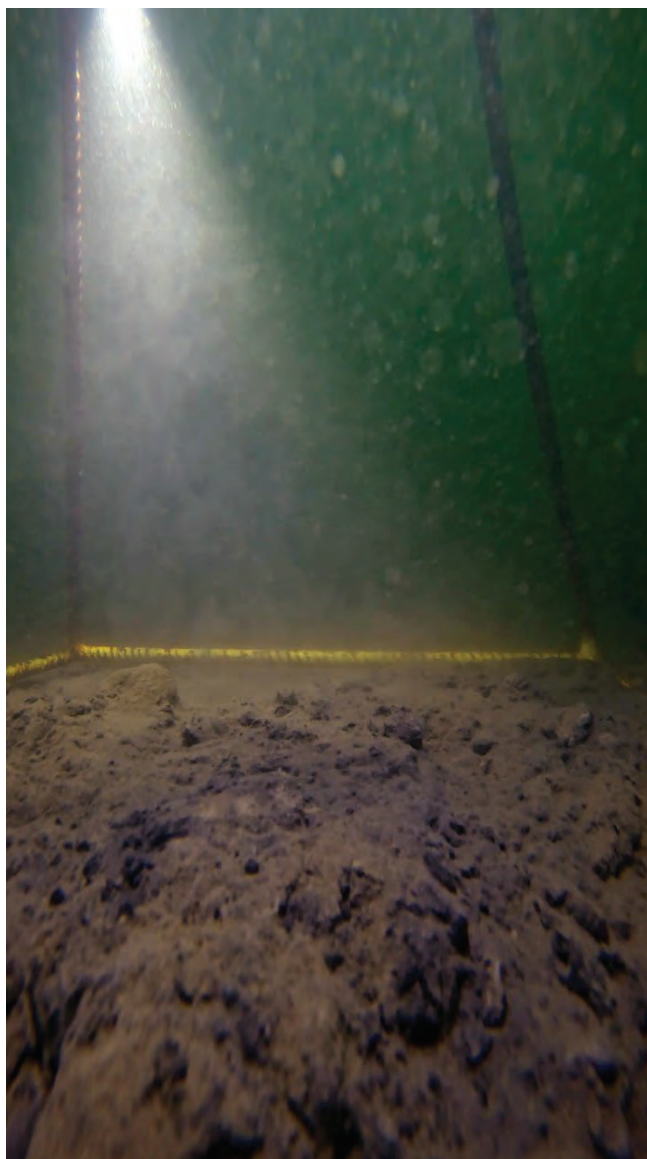
Bare silt with infaunal invertebrate tubes and burrows. Located on the western end of the 35-foot Reserved Channel.

Survey Area: <i>South Boston – Reserved Channel</i>			Station: <i>SB-17</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.343299</i>	Longitude (NAD83): <i>-71.031417</i>		Water Depth (FT): <i>-38.5</i>	

Plan View

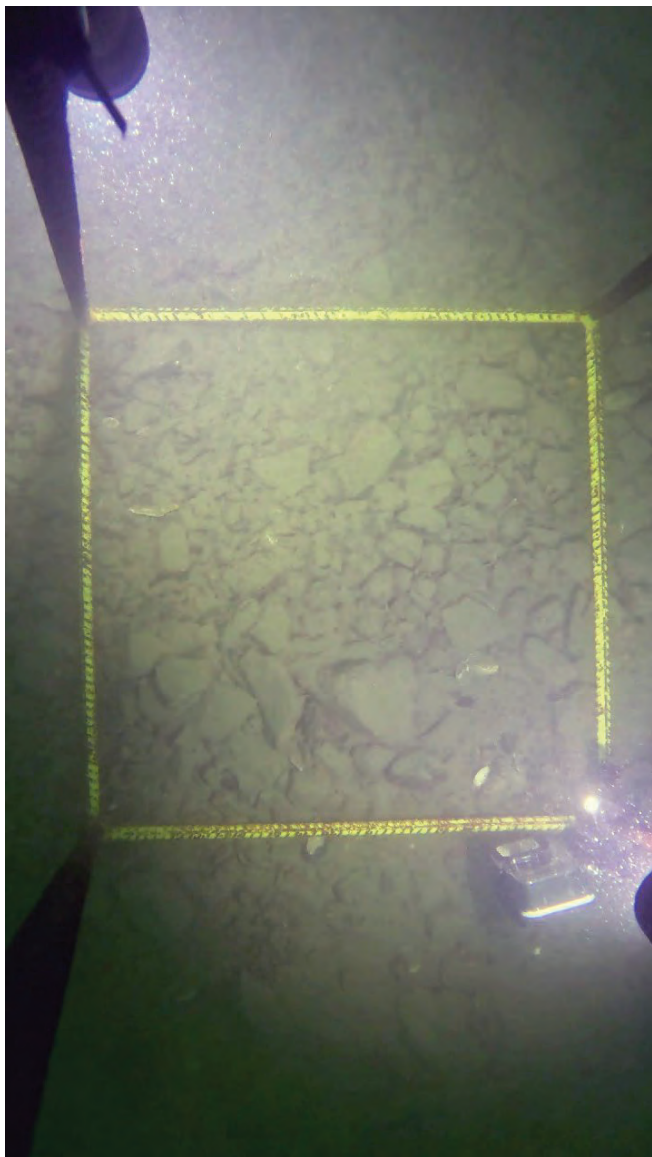
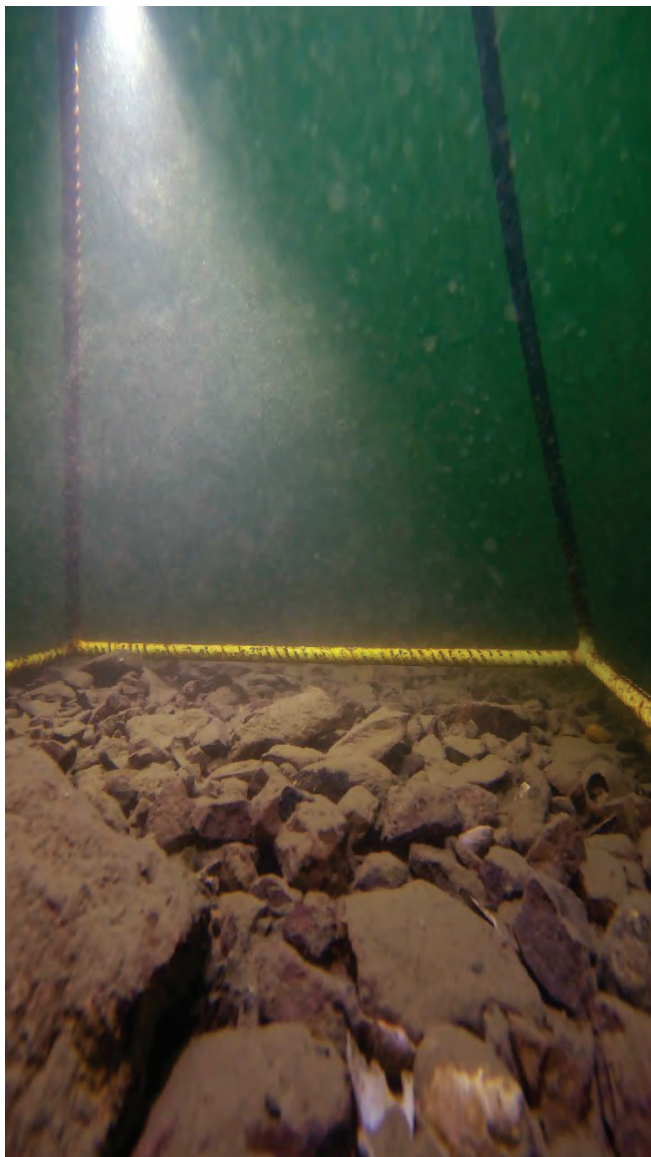


Profile View



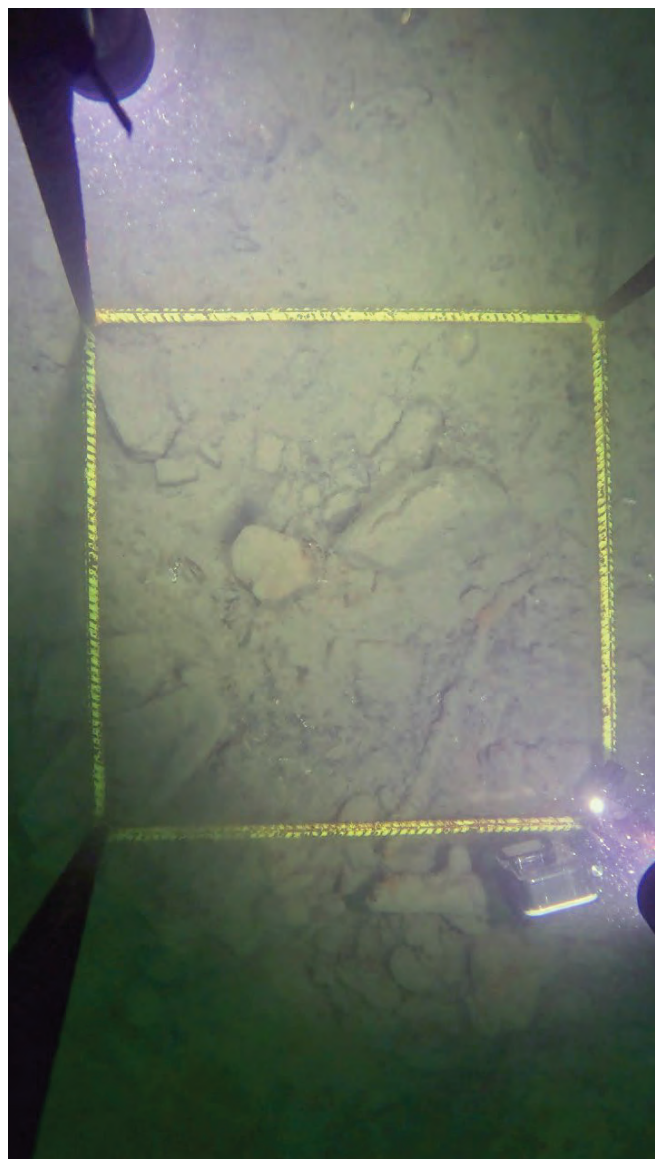
Notes:

Silt with infaunal invertebrate tubes and burrows and sparse coarse debris. A high degree of unoxidized silt at the sediment surface, likely a result of bioturbation. Located just north of the 35-foot Reserved Channel adjacent to Flynn Cruiseport.

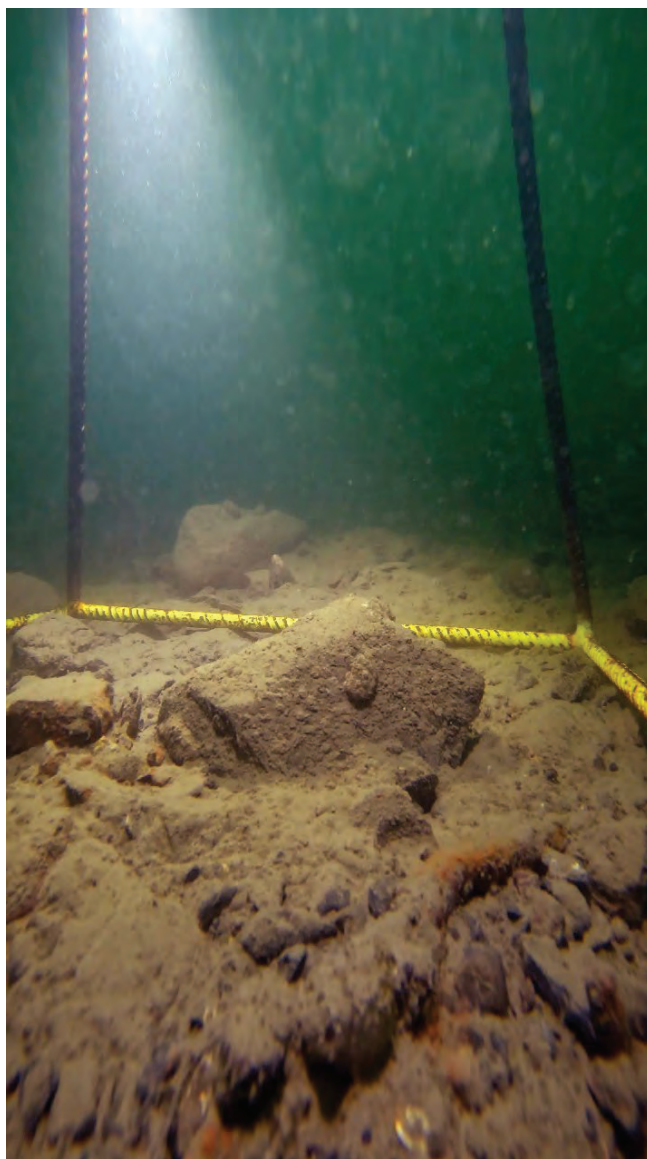
Survey Area:		South Boston – Reserved Channel		Station:		SB-18					
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.343336		Longitude (NAD83):		-71.029401		Water Depth (FT):		-40.3	
Plan View						Profile View					
											
Notes:											
Gravel and cobbles with trace shell rubble. Located just north of the 40-foot Reserved Channel adjacent to Flynn Cruiseport.											

Survey Area: <i>South Boston – Reserved Channel</i>			Station: <i>SB-19</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.343415</i>	Longitude (NAD83): <i>-71.026280</i>		Water Depth (FT): <i>-38.5</i>	

Plan View



Profile View

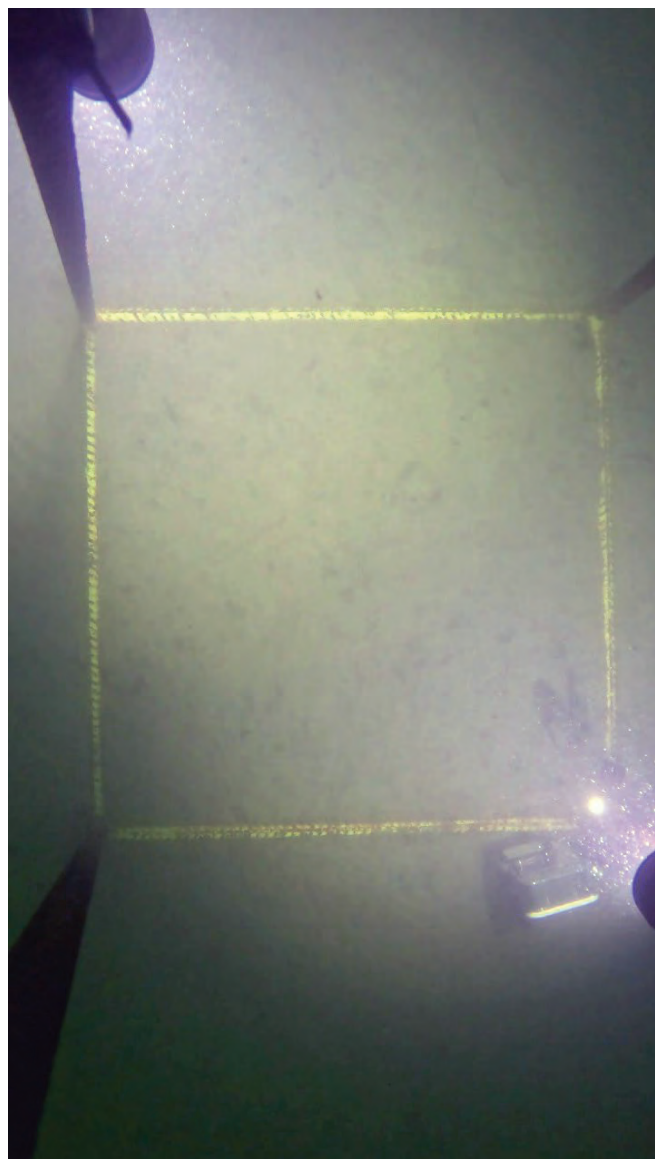


Notes:

Silt with gravel and cobbles and trace anthropogenic debris. Located just north of the 40-foot Reserved Channel adjacent to Flynn Cruiseport.

Survey Area: <i>South Boston – Reserved Channel</i>			Station: <i>SB-20</i>		
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>		Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.343800</i>		Longitude (NAD83): <i>-71.021748</i>		Water Depth (FT): <i>-38.7</i>	

Plan View



Profile View



Notes:

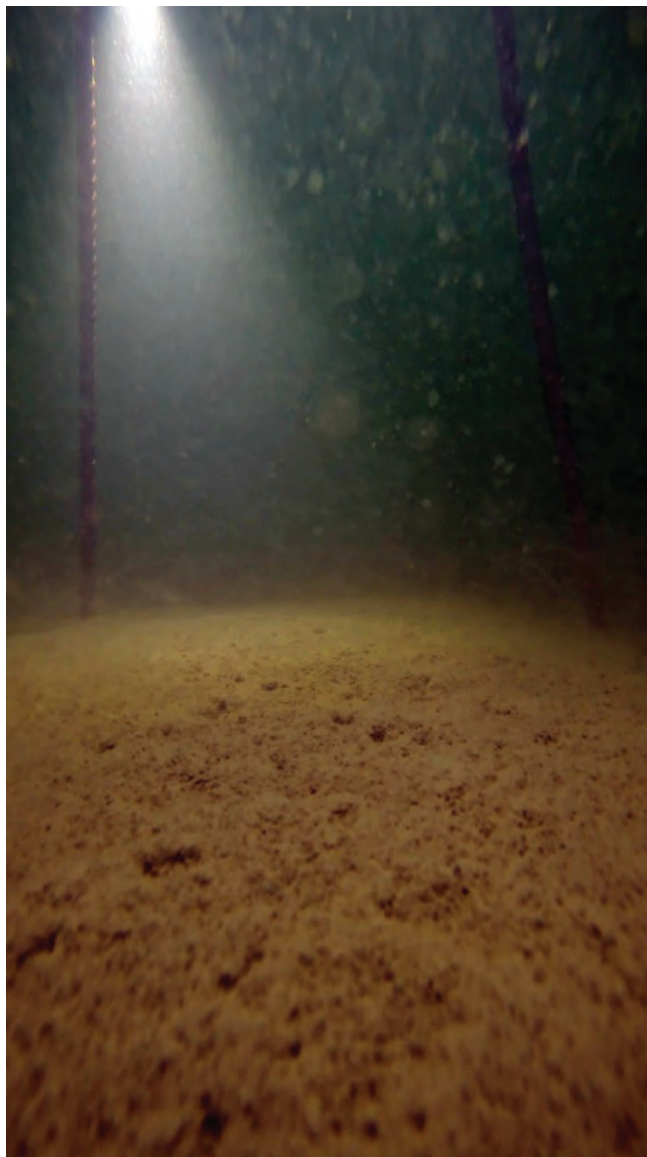
Mostly bare silt with infaunal invertebrate tubes and burrows. Located on the eastern end of the Reserved Channel, just north of the federal channel, adjacent to Flynn Cruiseport.

Survey Area: <i>South Boston – Dry Dock</i>			Station: <i>SB-21</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.345240</i>	Longitude (NAD83): <i>-71.024321</i>		Water Depth (FT): <i>-41.2</i>	

Plan View



Profile View

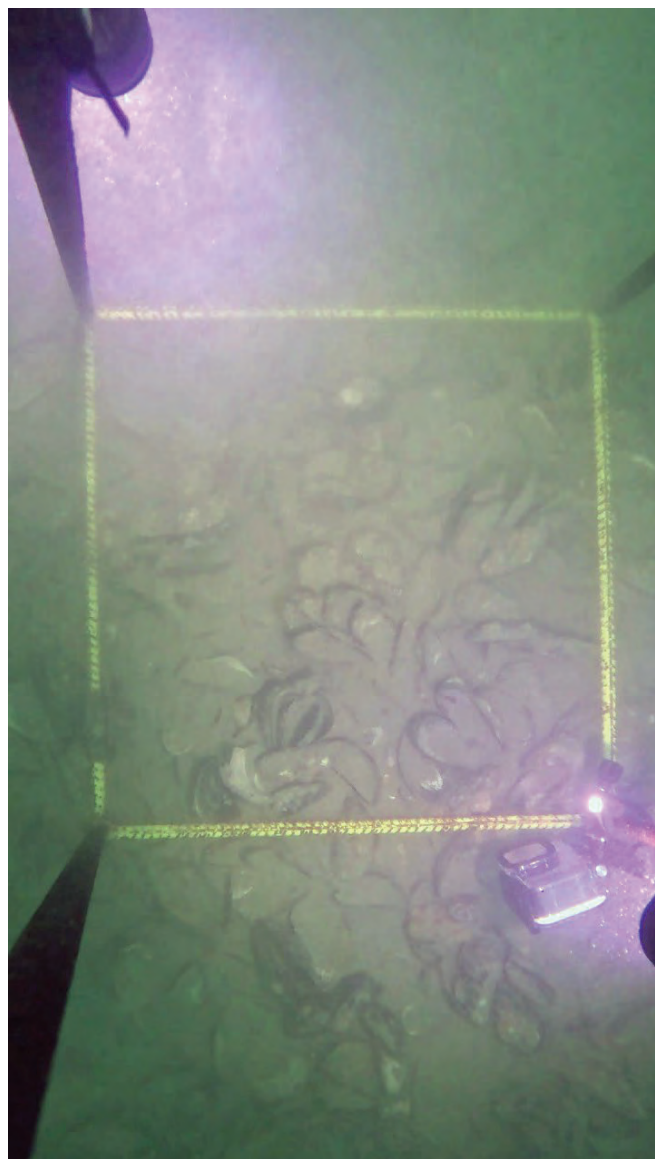


Notes:

Bare silt with infaunal invertebrate tubes and burrows. Located within the 40-foot Approach Channel adjacent to the entrance of Boston Dry Dock #3.

Survey Area: <i>South Boston – Dry Dock</i>			Station: <i>SB-22</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.346222</i>	Longitude (NAD83): <i>-71.023109</i>		Water Depth (FT):	<i>-27.3</i>

Plan View



Profile View

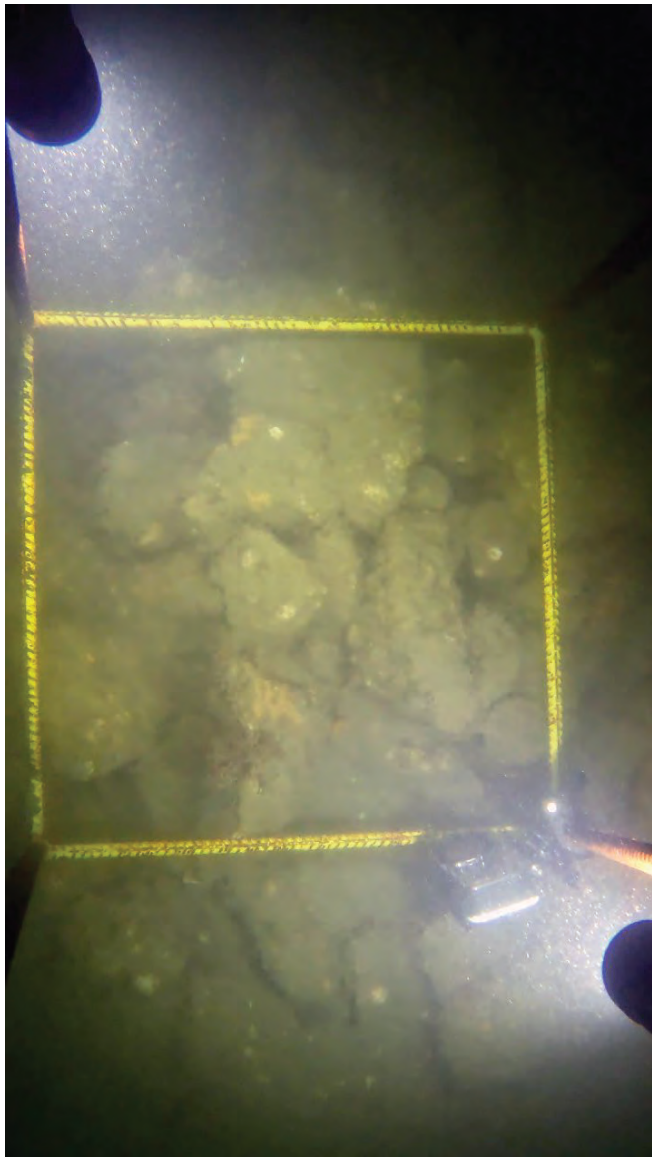
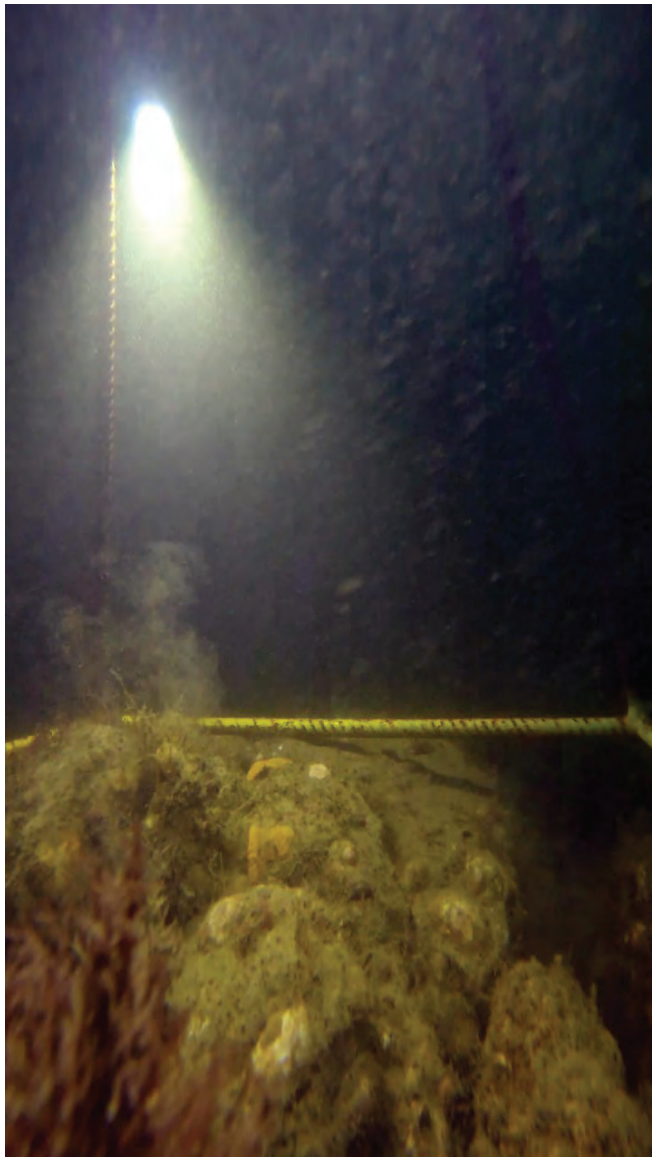


Notes:

Mussel shell reef. Located approximately 600 feet west of the 40-foot Main Ship Channel, adjacent to the J.C. Cannistraro construction supply terminal.

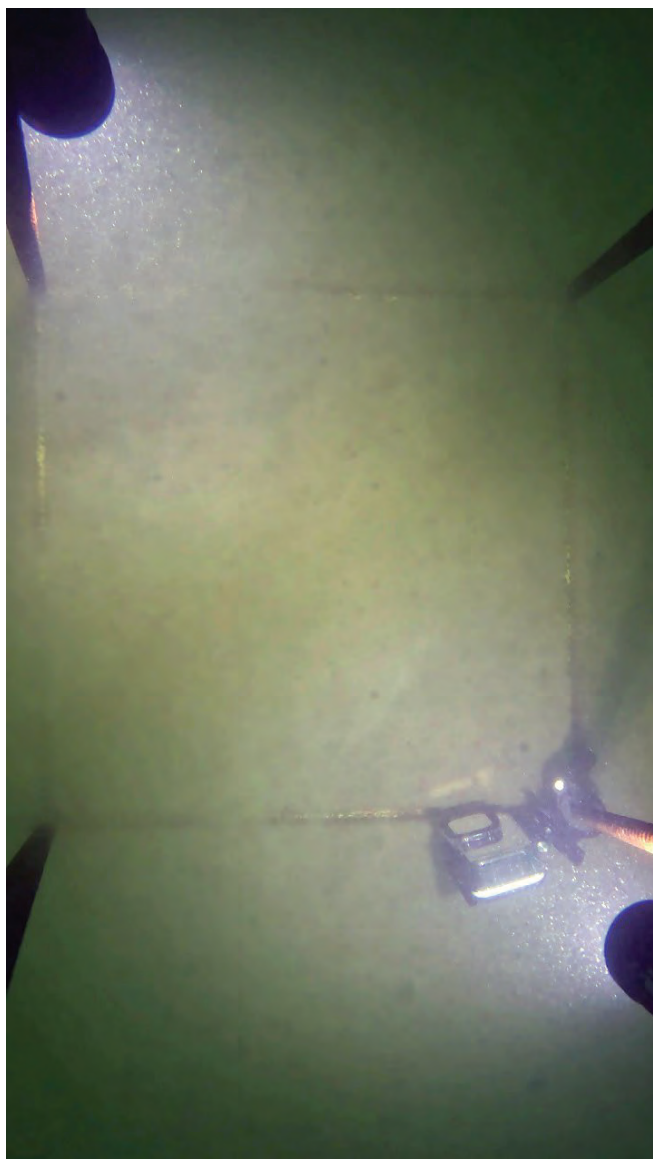
BOSTON HARBOR - SURGE BARRIER



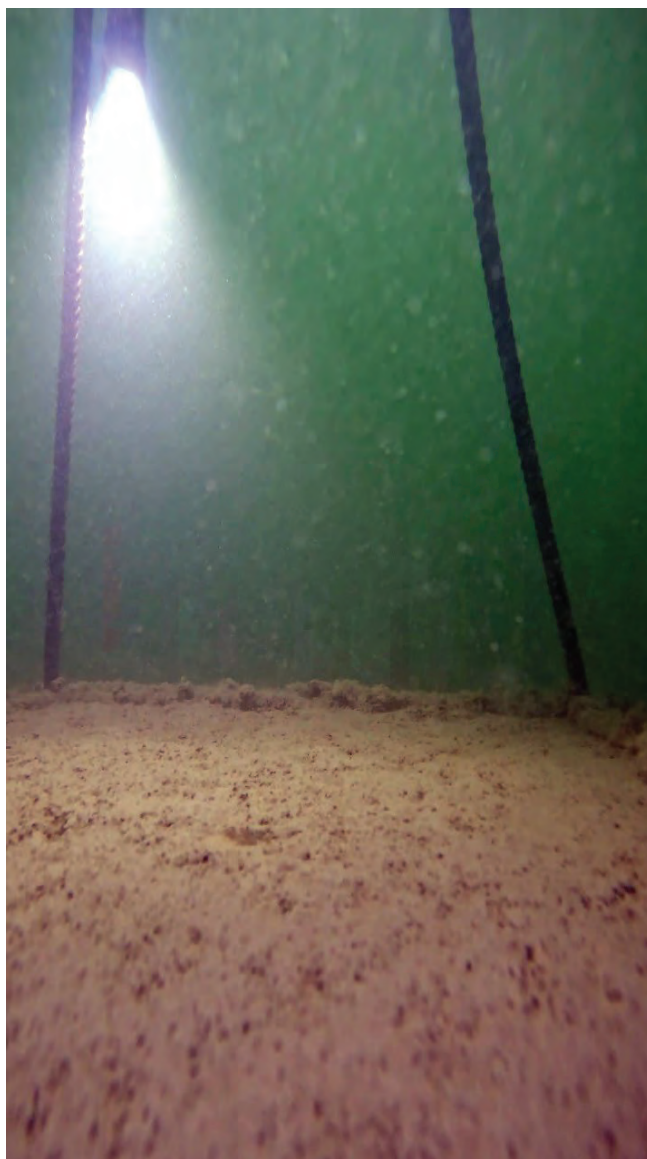
Survey Area:		Boston Harbor Surge Barrier		Station:		MSC-1					
Date:		10/24/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.355373		Longitude (NAD83):		-71.027333		Water Depth (FT):		-36.5	
Plan View						Profile View					
											
Notes:											

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-2</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.355100</i>	Longitude (NAD83): <i>-71.025412</i>		Water Depth (FT): <i>-30.4</i>	

Plan View



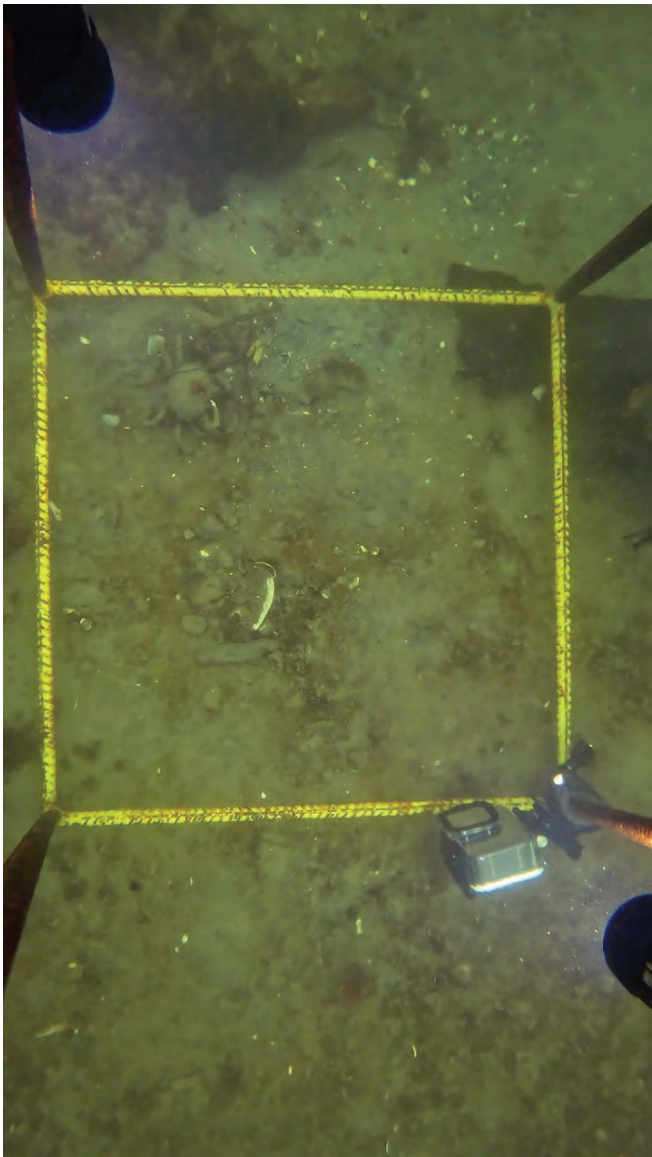
Profile View



Notes:

Bare silt with small infaunal invertebrate tubes and burrows. Located north of the 35-foot North Channel.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-3</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.355750</i>	Longitude (NAD83): <i>-71.024199</i>		Water Depth (FT):	<i>-6.3</i>

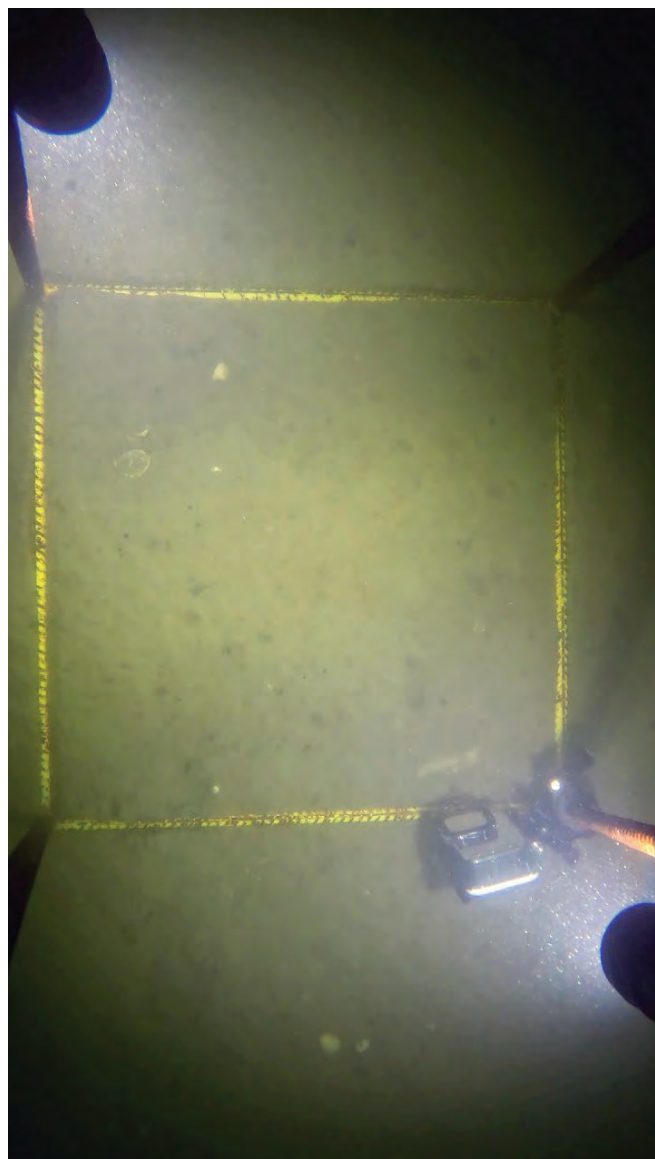
Plan View	Profile View
	

Notes:

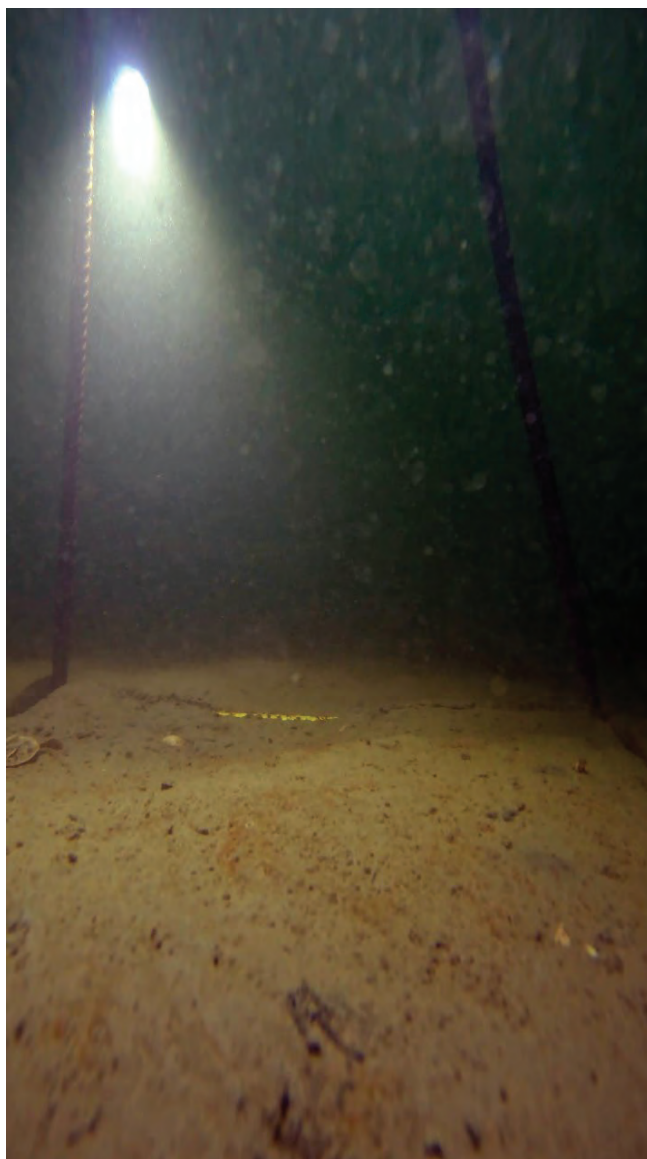
Silty sand with gravel and shell hash/rubble. Mixed macroalgae attached to hard substrate. Spider crab (Majoidea sp.) present within quadrat. Located north of the 35-foot North Channel, adjacent to the Logan Airport shoreline.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-4</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.354030</i>	Longitude (NAD83): <i>-71.028310</i>		Water Depth (FT):	<i>-38.3</i>

Plan View



Profile View

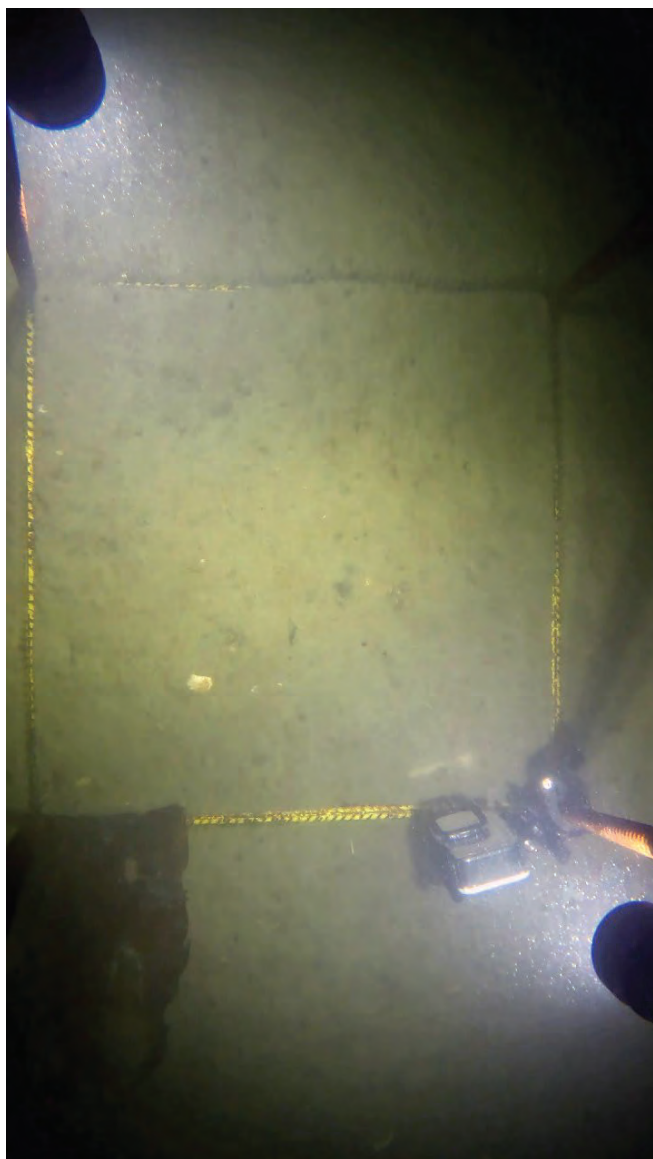


Notes:

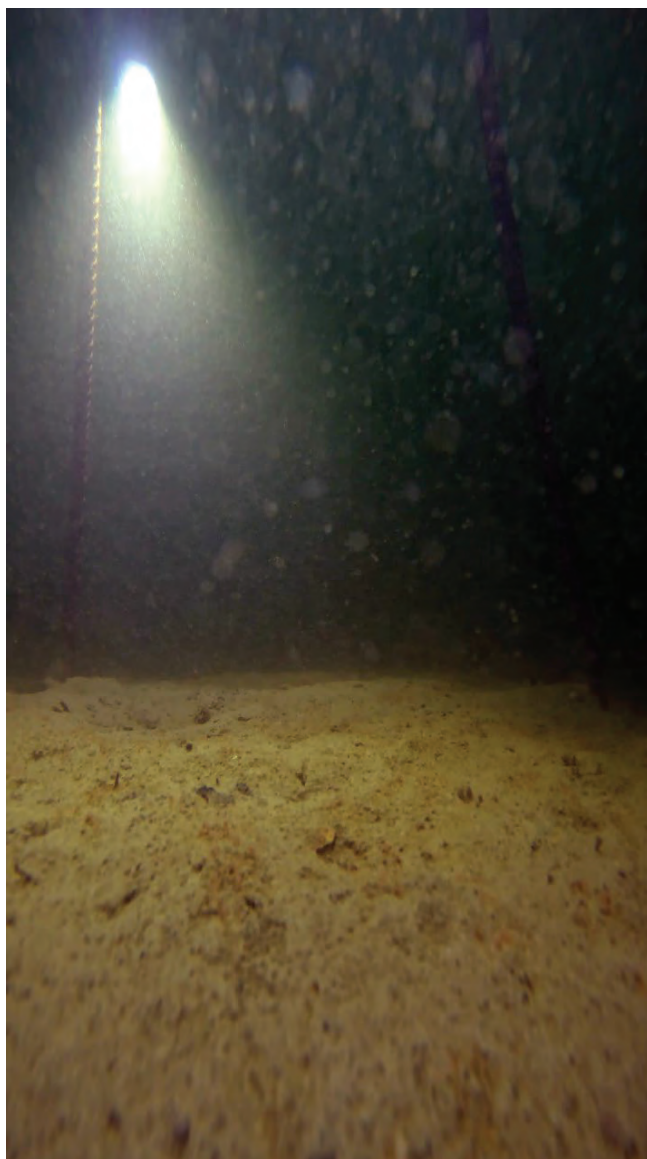
Silt with trace shell hash/rubble. Infaunal invertebrate castings present. Located on top of the Ted Williams Tunnel, just north of the 35-foot North Channel.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-5</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.351979</i>	Longitude (NAD83): <i>-71.029603</i>		Water Depth (FT): <i>-45.2</i>	

Plan View



Profile View

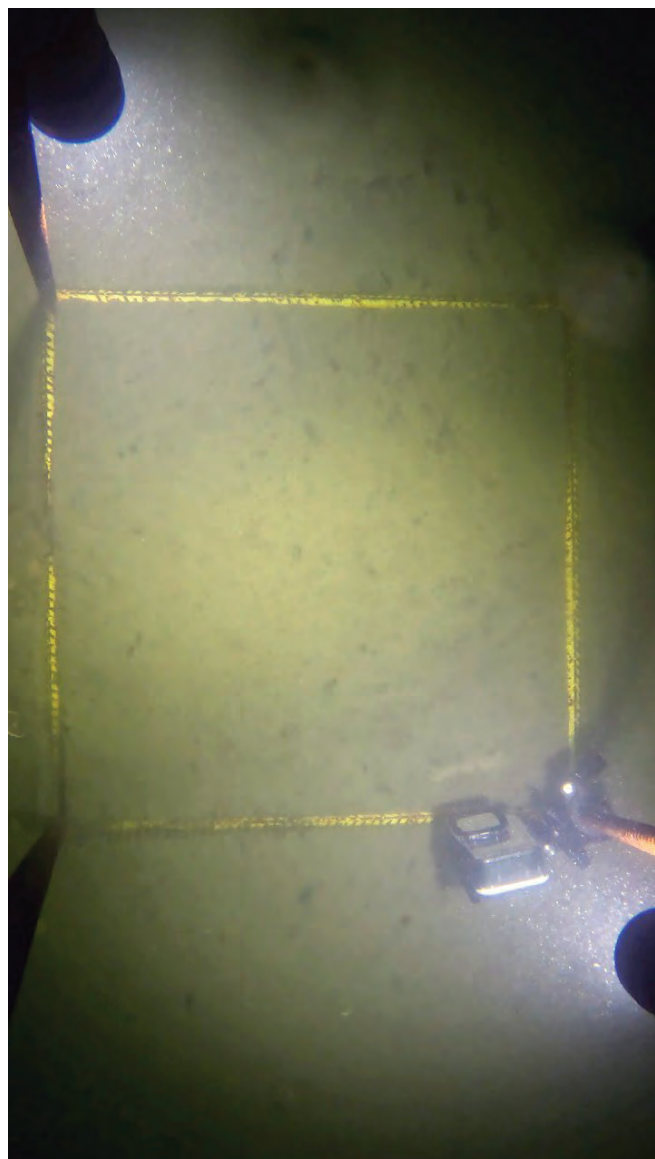


Notes:

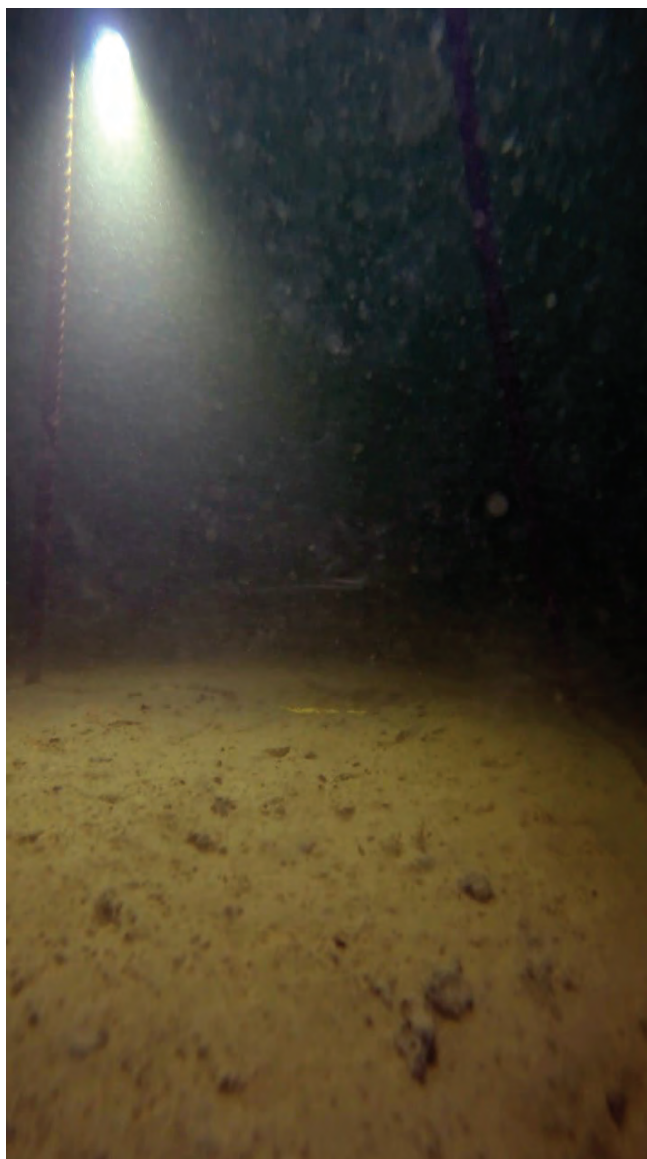
Silt with trace shell hash and gravel. Infaunal invertebrate tubes and burrows present. Located on top of the Ted Williams Tunnel, within the 40-foot Main Ship Channel.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-6-2</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.350961</i>	Longitude (NAD83): <i>-71.030649</i>		Water Depth (FT): <i>-37.7</i>	

Plan View

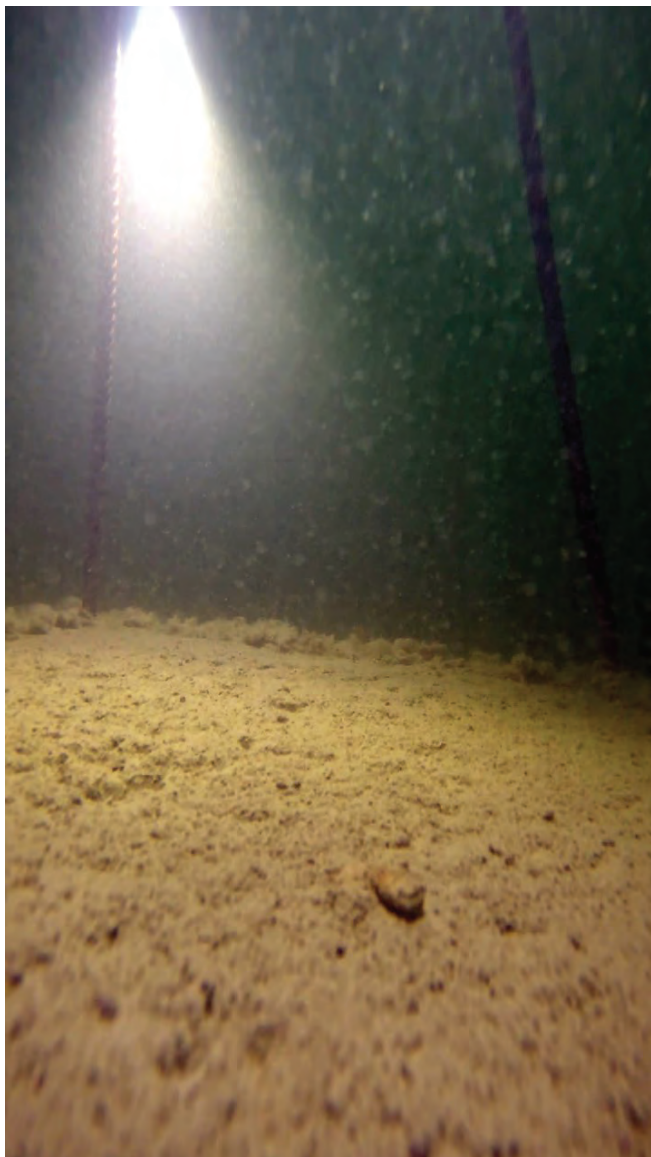


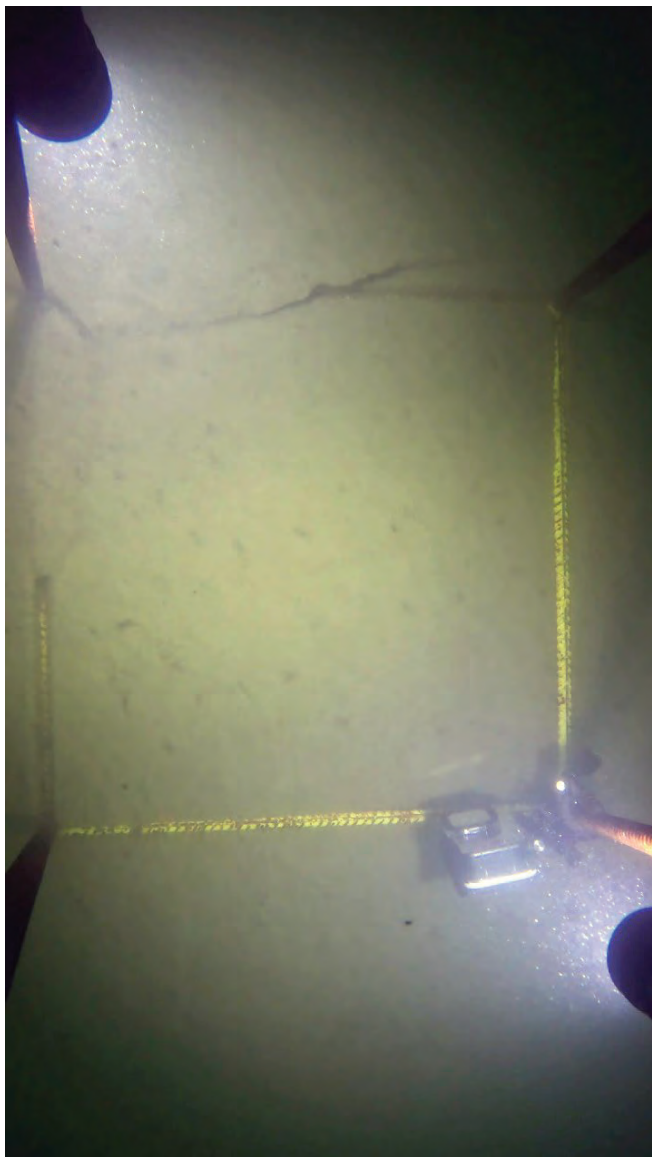
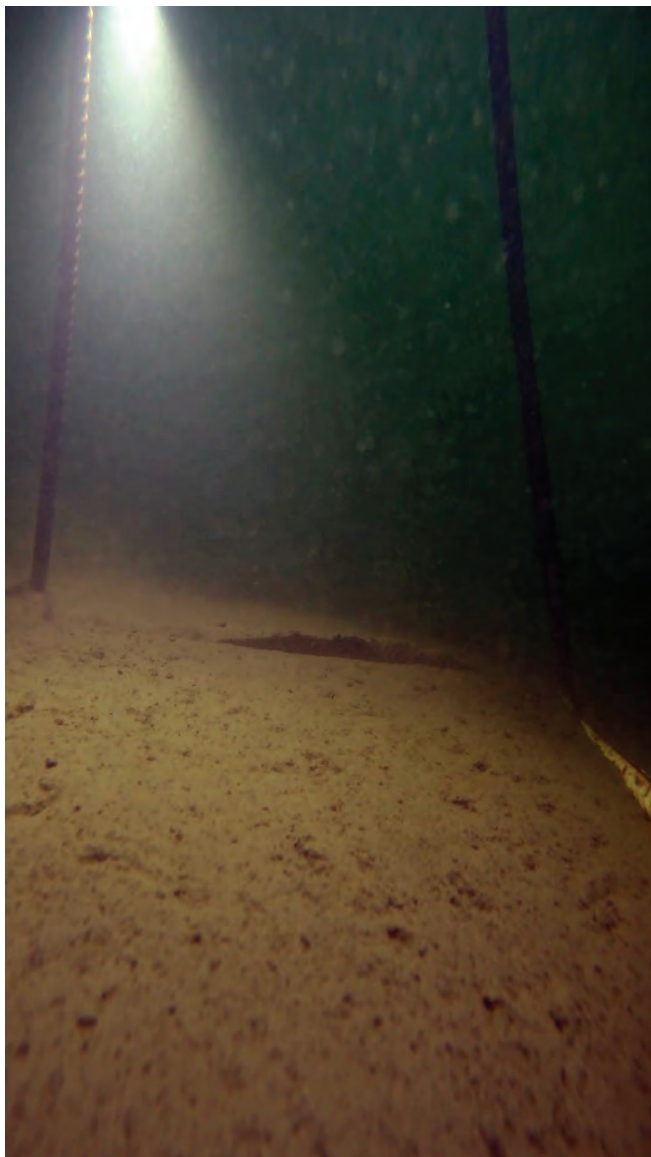
Profile View



Notes:

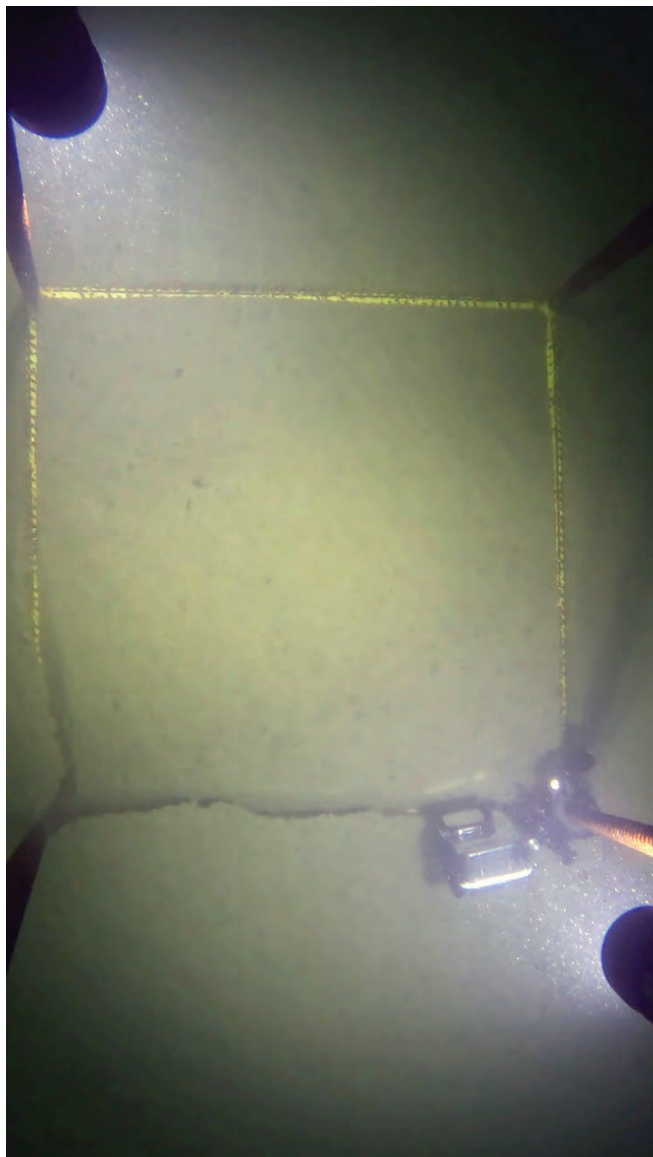
Silt with trace shell hash and infaunal invertebrate tubes and burrows. Infaunal invertebrate castings and bioturbated sediments present. Located on top of the Ted Williams Tunnel, just south of the 40-foot Main Ship Channel, adjacent to mound of coarse sediment at MSC-6 (video footage corrupted).

Survey Area:		<i>Boston Harbor Surge Barrier</i>		Station:		<i>MSC-7</i>					
Date:		<i>10/24/2023</i>		Vessel:		<i>R/V Nomad</i>		Platform:		<i>0.25m² drop frame - plan and profile cameras</i>	
Latitude (NAD83):		<i>42.350306</i>		Longitude (NAD83):		<i>-71.027155</i>		Water Depth (FT):		<i>-42.6</i>	
Plan View						Profile View					
											
Notes:											
<i>Bare silt with small infaunal invertebrate tubes and burrows. Located within the 40-foot Main Ship Channel.</i>											

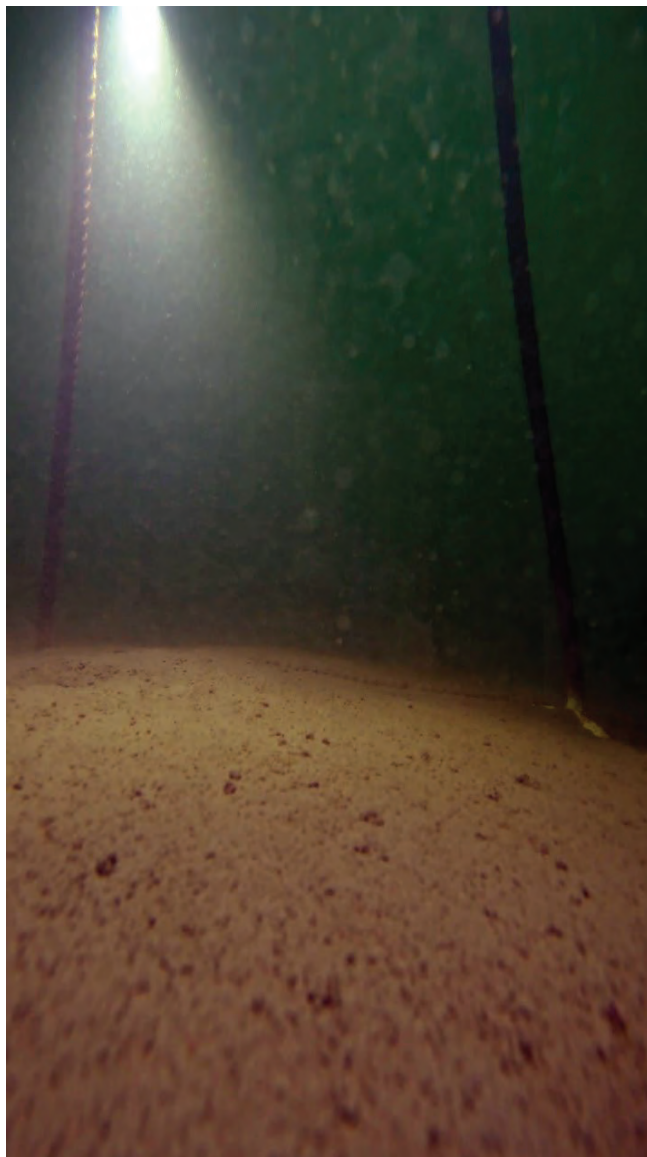
Survey Area:		Boston Harbor Surge Barrier		Station:		MSC-8	
Date: 10/24/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.350985		Longitude (NAD83): -71.024721		Water Depth (FT):		-38.2	
Plan View				Profile View			
							
Notes:							
Bare silt with small infaunal invertebrate tubes and burrows. Located within the 35-foot North Channel.							

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-9</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.350602</i>	Longitude (NAD83): <i>-71.024051</i>		Water Depth (FT): <i>-39.6</i>	

Plan View



Profile View

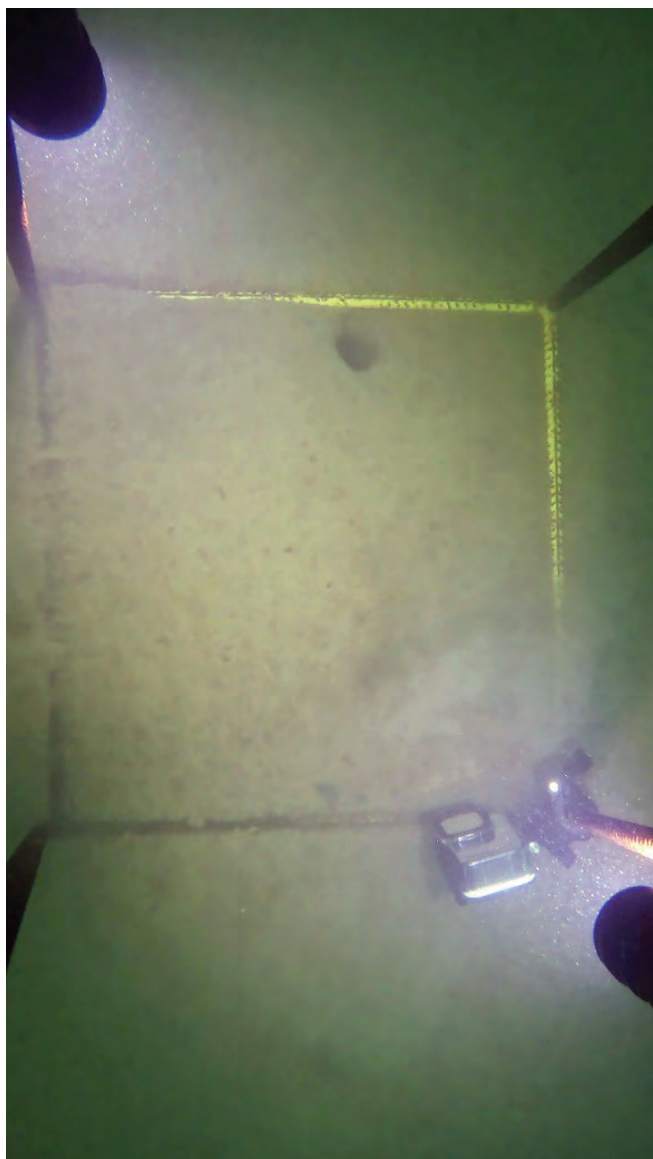


Notes:

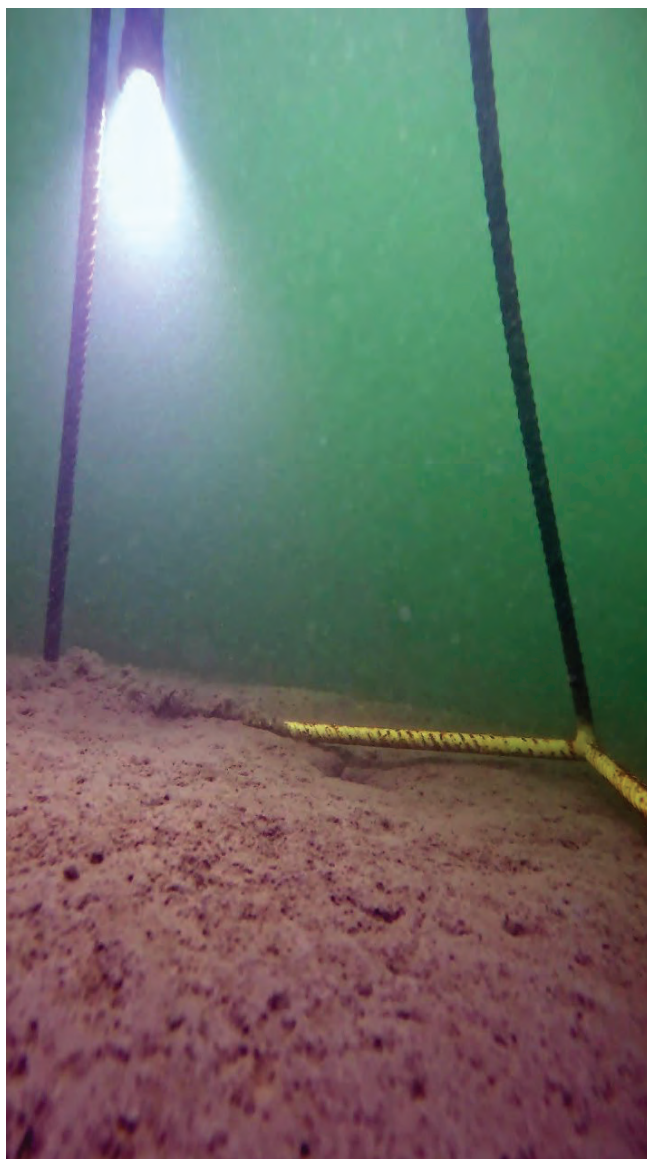
Bare silt with small infaunal invertebrate tubes and burrows. Located within the 35-foot North Channel.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-10</i>		
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>		Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.352380</i>		Longitude (NAD83): <i>-71.022302</i>		Water Depth (FT): <i>-28.0</i>	

Plan View

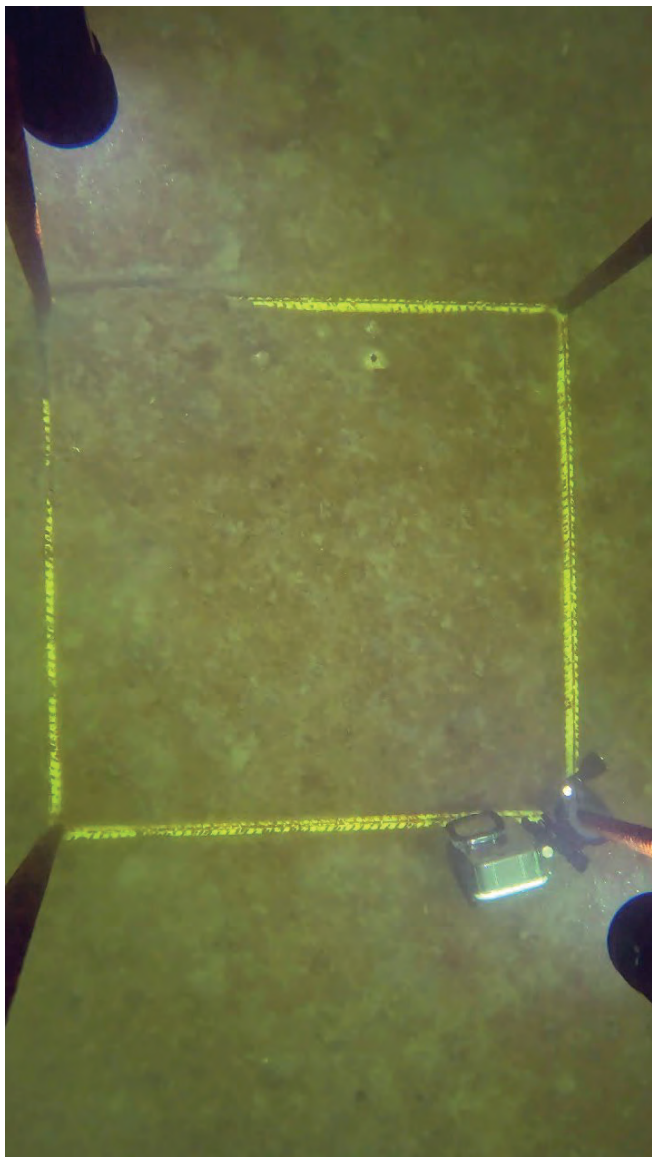


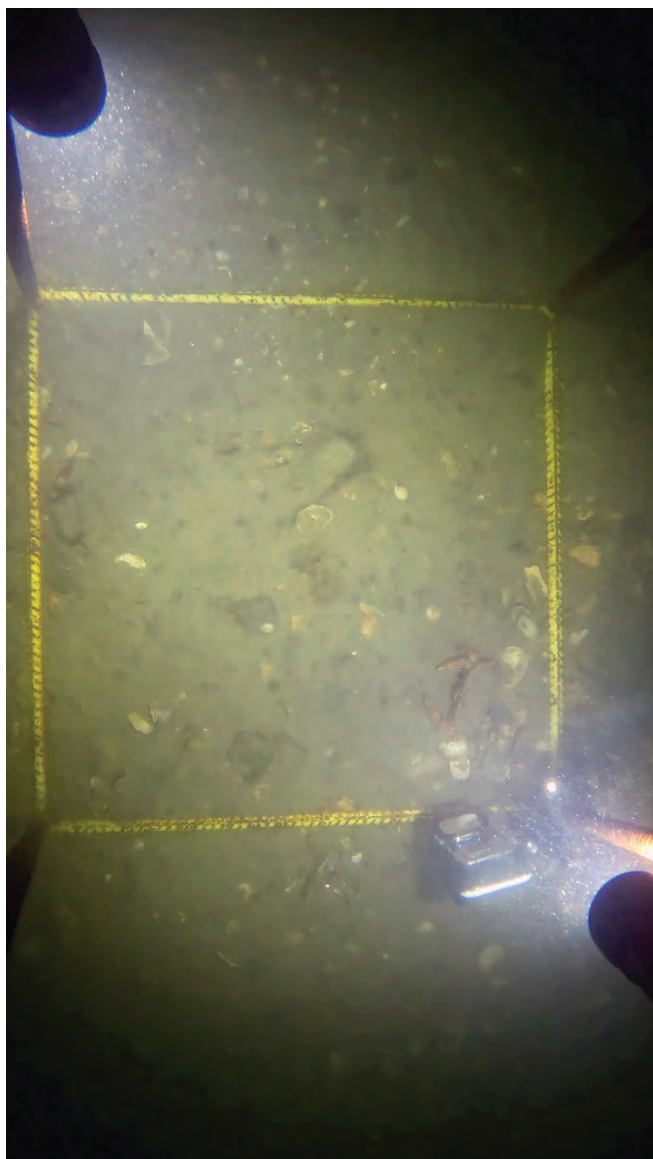
Profile View



Notes:

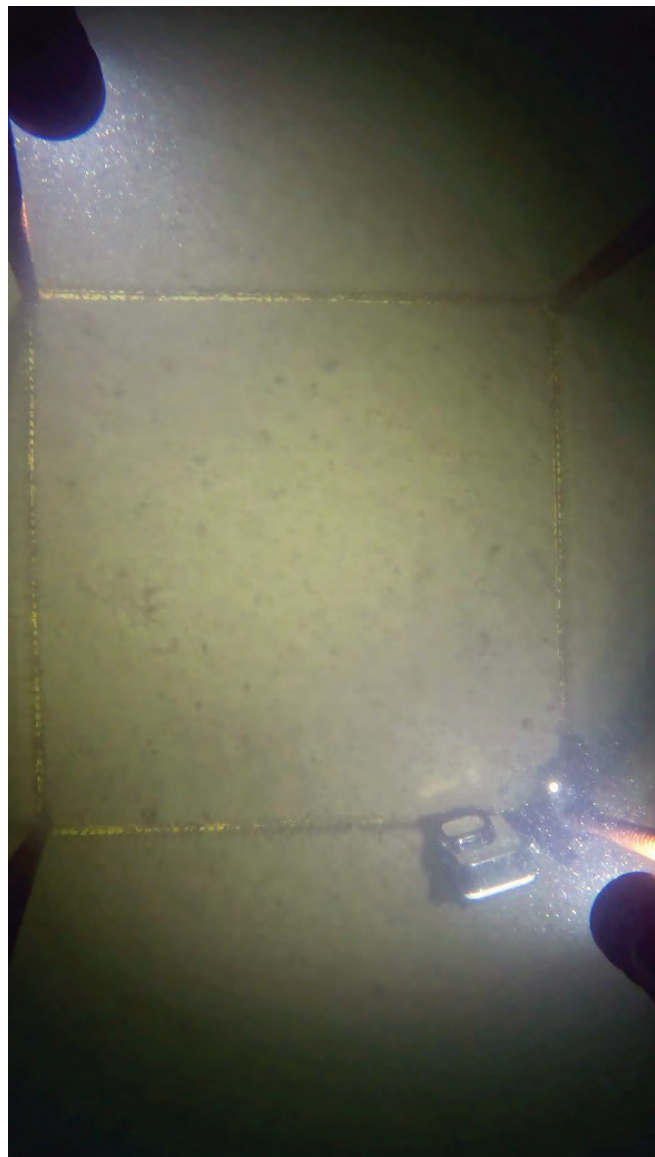
Bare silt with small infaunal invertebrate tubes and burrows. One large sediment burrow present within the quadrat. Located north of the 35-foot North Channel.

Survey Area:		Boston Harbor Surge Barrier		Station:		MSC-11	
Date: 10/24/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.354132		Longitude (NAD83): -71.021260		Water Depth (FT):		-15.8	
Plan View				Profile View			
							
Notes:							
Silt with a thin layer of microbial algae and many infaunal invertebrate castings. Located north of the 35-foot North Channel, near the Logan Airport shoreline.							

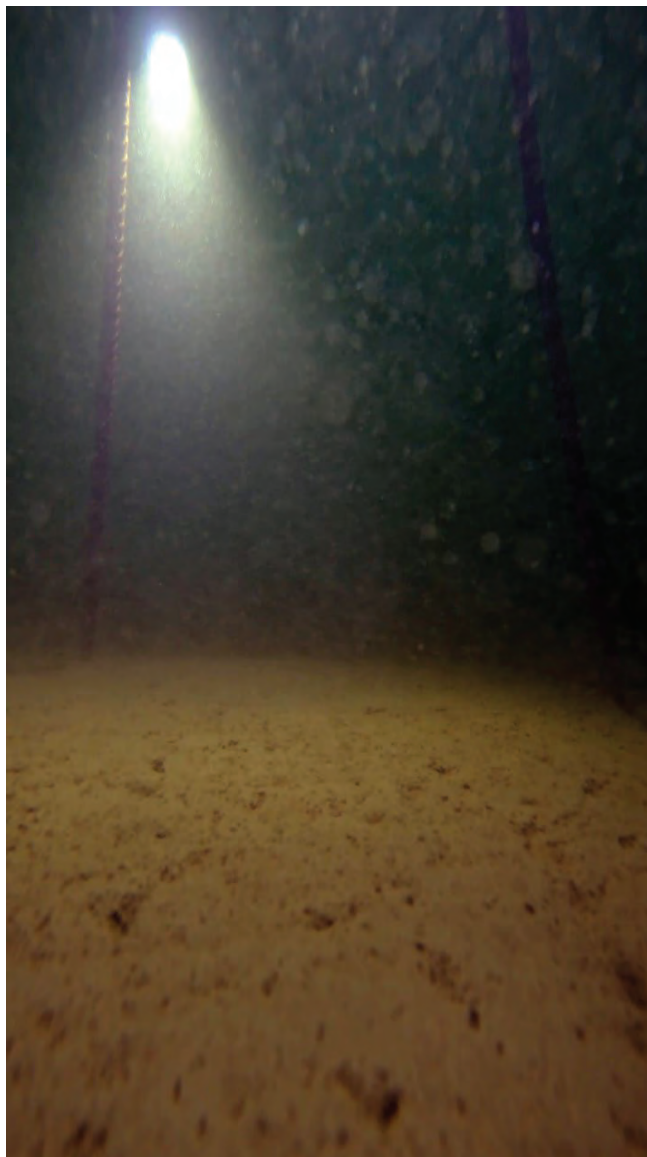
Survey Area:		Boston Harbor Surge Barrier		Station:		MSC-12					
Date:		10/24/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.349222		Longitude (NAD83):		-71.024749		Water Depth (FT):		-44.0	
Plan View						Profile View					
						No image available					
Notes:											
Silt with moderate to dense gravel and shell hash/rubble. Much of the shell material appears to be derived from Crepidula shells. Crab (Cancer sp.) present within quadrat. Located within the 40-foot Main Ship Channel.											

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-13</i>		
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>		Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.348040</i>		Longitude (NAD83): <i>-71.024915</i>		Water Depth (FT): <i>-42.6</i>	

Plan View



Profile View

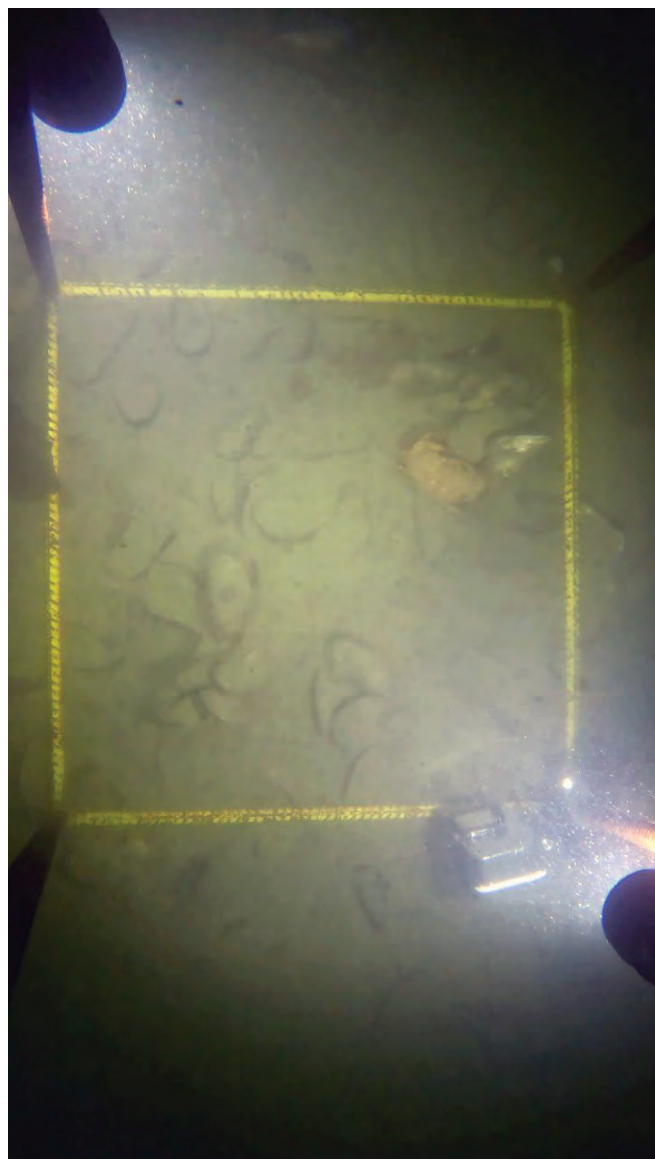


Notes:

Bare silt with small infaunal invertebrate tubes and burrows. Located approximately 150 feet south the 40-foot Main Ship Channel.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-14</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.348037</i>	Longitude (NAD83): <i>-71.025802</i>		Water Depth (FT): <i>-32.9</i>	

Plan View



Profile View

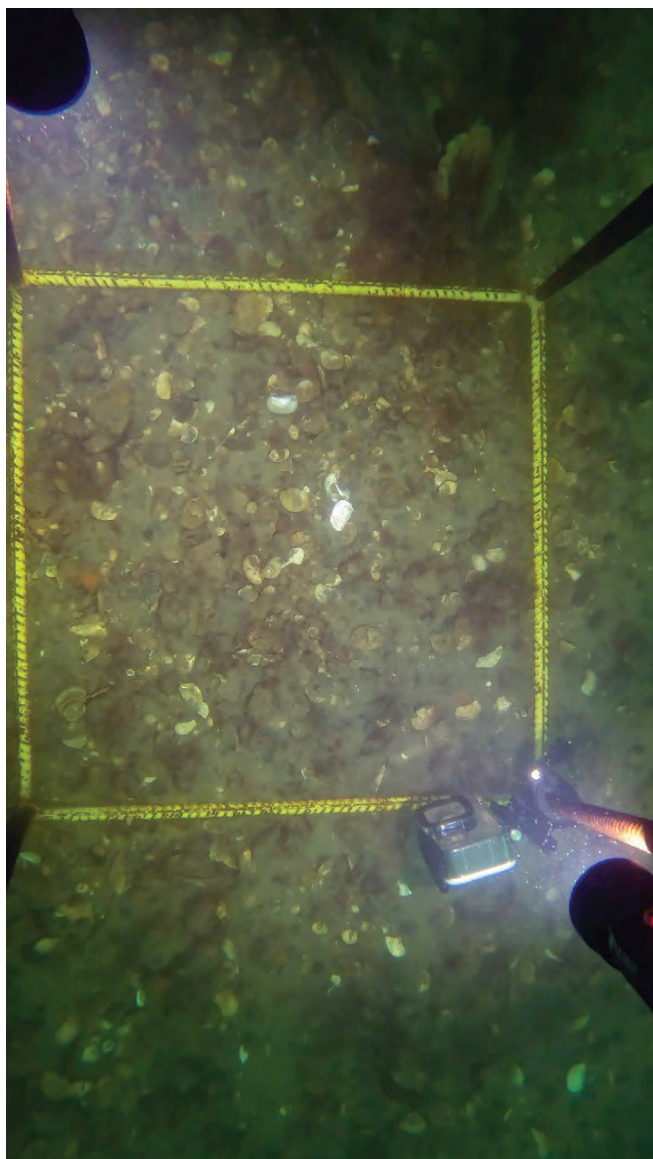


Notes:

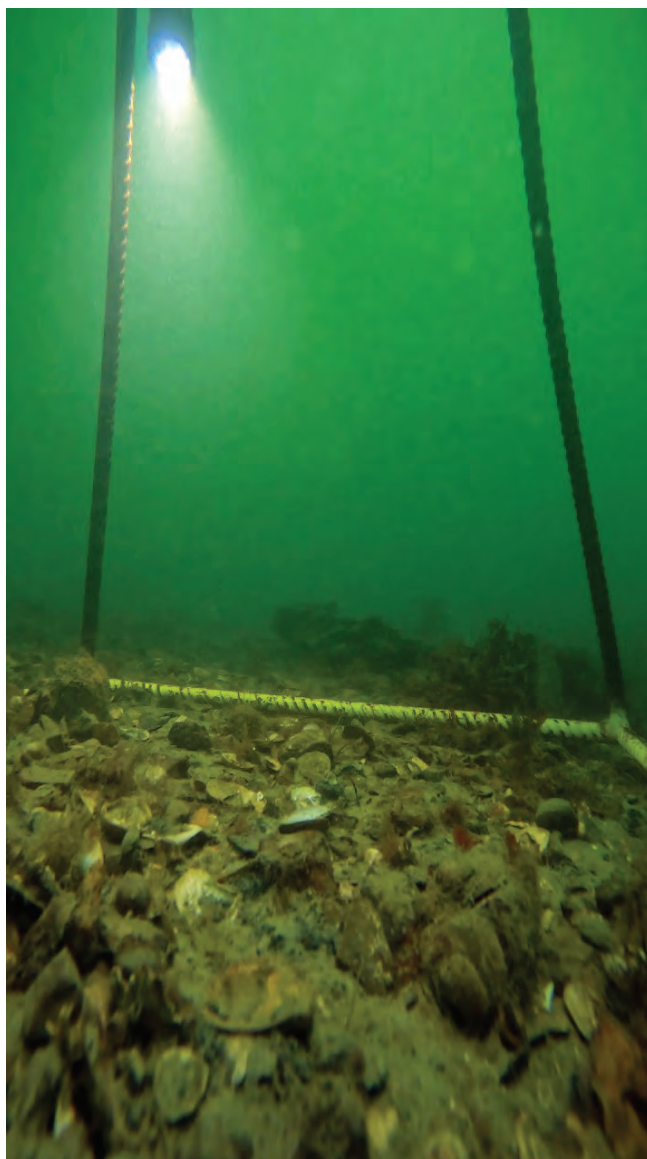
Silt with dense mussel shell rubble. Crab (Cancer sp.) present within quadrat. Trace bushy ectoprocta (Bugula sp.) attached to shell substrate. Located south of the 40-foot Main Ship Channel, near the South Boston shoreline.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-15</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.349168</i>	Longitude (NAD83): <i>-71.028750</i>		Water Depth (FT): <i>-11.0</i>	

Plan View



Profile View

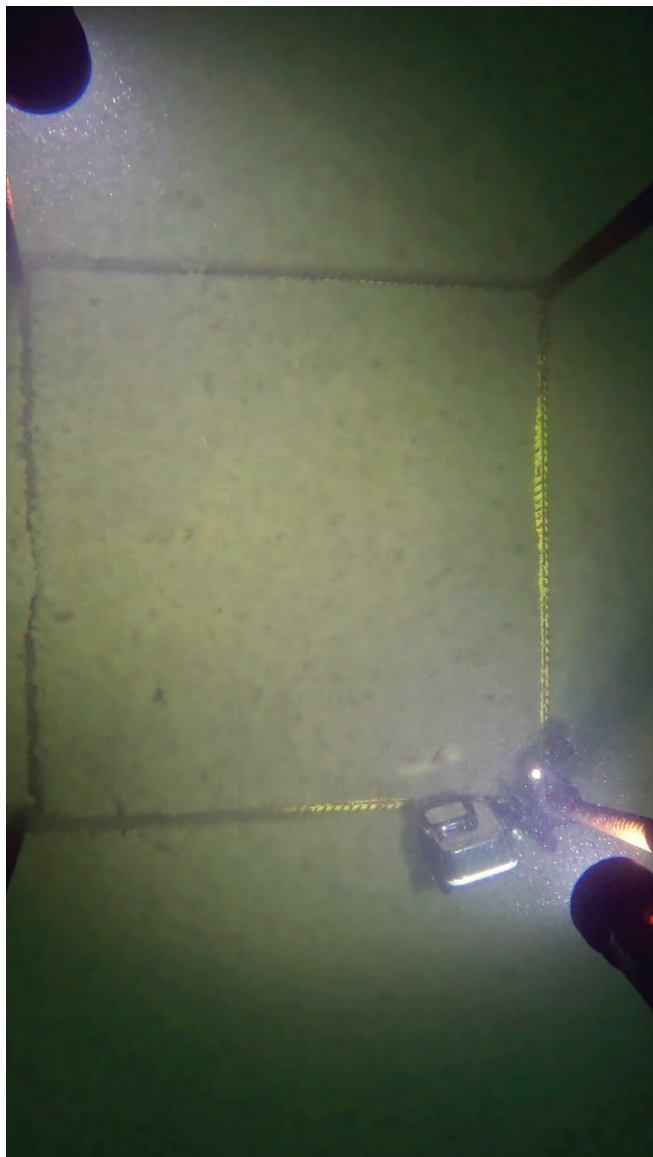


Notes:

Gravel and shell reef. Sparse ectoprocts and hydroids attached to hard substrate. Leathery/leafy macroalgae visible in the background of the profile-view image. Located south of the 40-foot Main Ship Channel, near the South Boston shoreline.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-16</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.349950</i>	Longitude (NAD83): <i>-71.029409</i>		Water Depth (FT): <i>-29.8</i>	

Plan View



Profile View

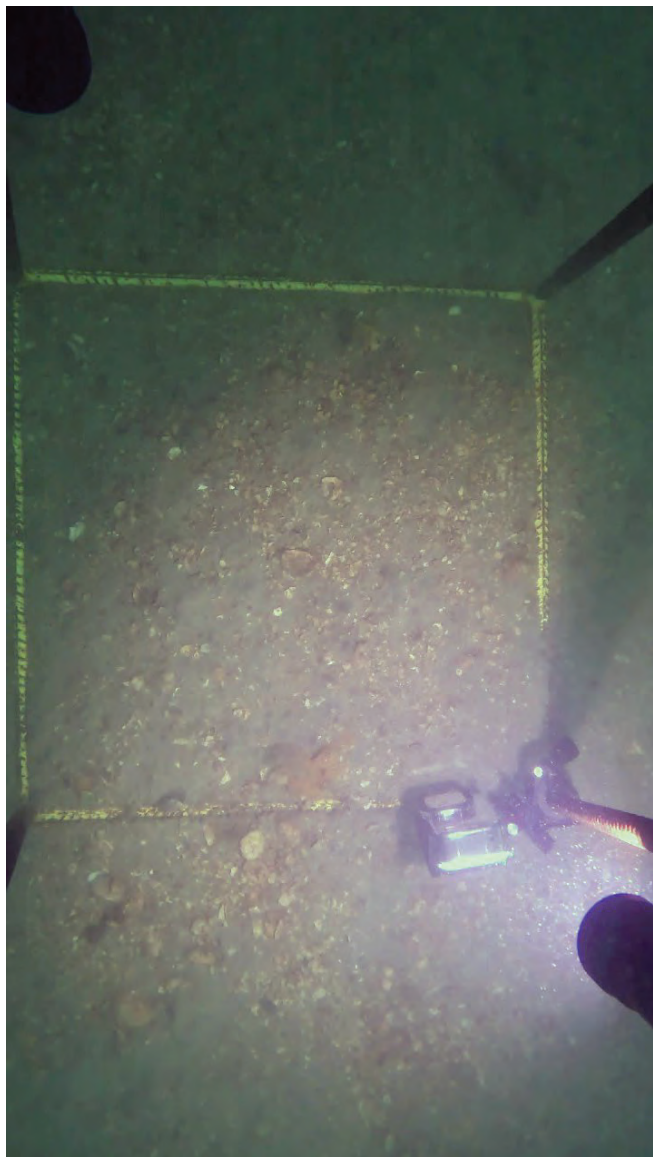


Notes:

Bare silt with small infaunal invertebrate tubes and burrows. Located approximately 150 feet south of the 40-foot Main Ship Channel.

Survey Area: <i>Boston Harbor Surge Barrier</i>			Station: <i>MSC-17</i>		
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>		Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.350495</i>		Longitude (NAD83): <i>-71.031262</i>		Water Depth (FT): <i>-28.0</i>	

Plan View



Profile View



Notes:

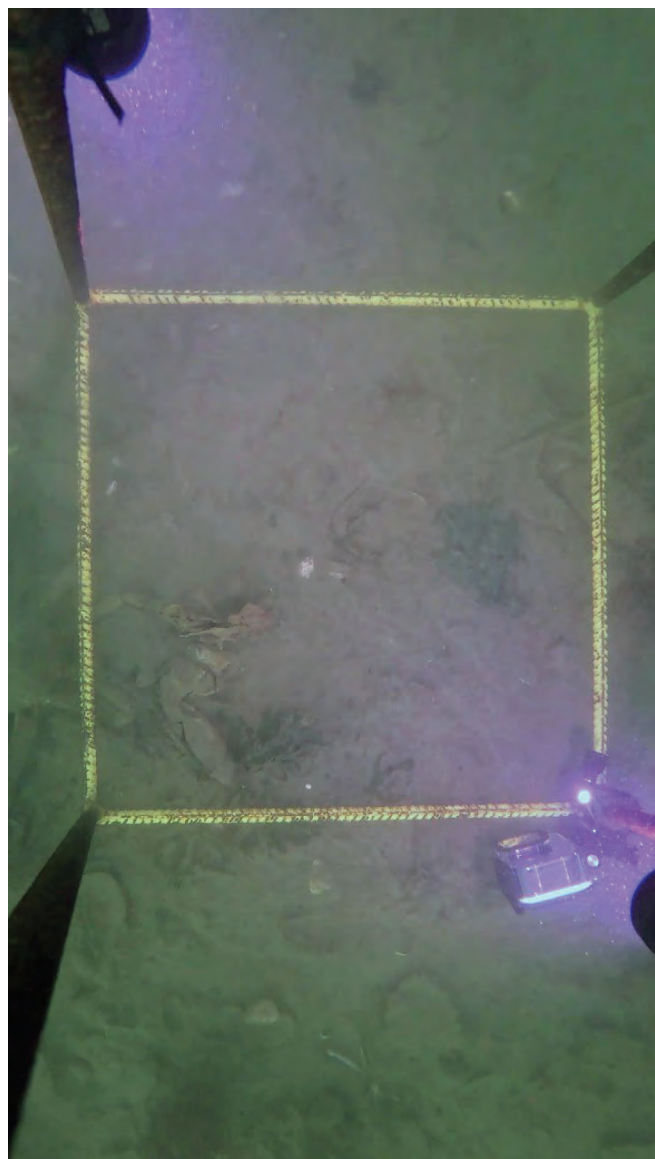
Sandy and gravel with shell hash. Located on top of the Ted Williams Tunnel, between the South Boston shoreline and the 40-foot Main Ship Channel.

BOSTON HARBOR - FORT POINT CHANNEL

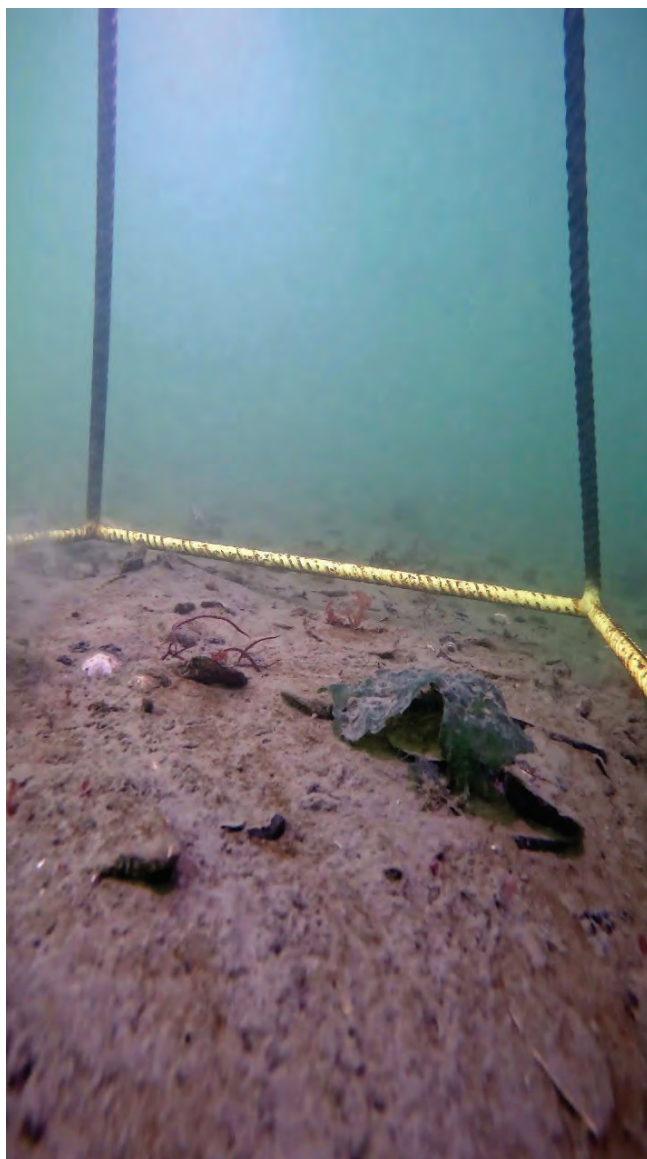


Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-1</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.354713</i>	Longitude (NAD83): <i>-71.049691</i>		Water Depth (FT): <i>-18.0</i>	

Plan View



Profile View

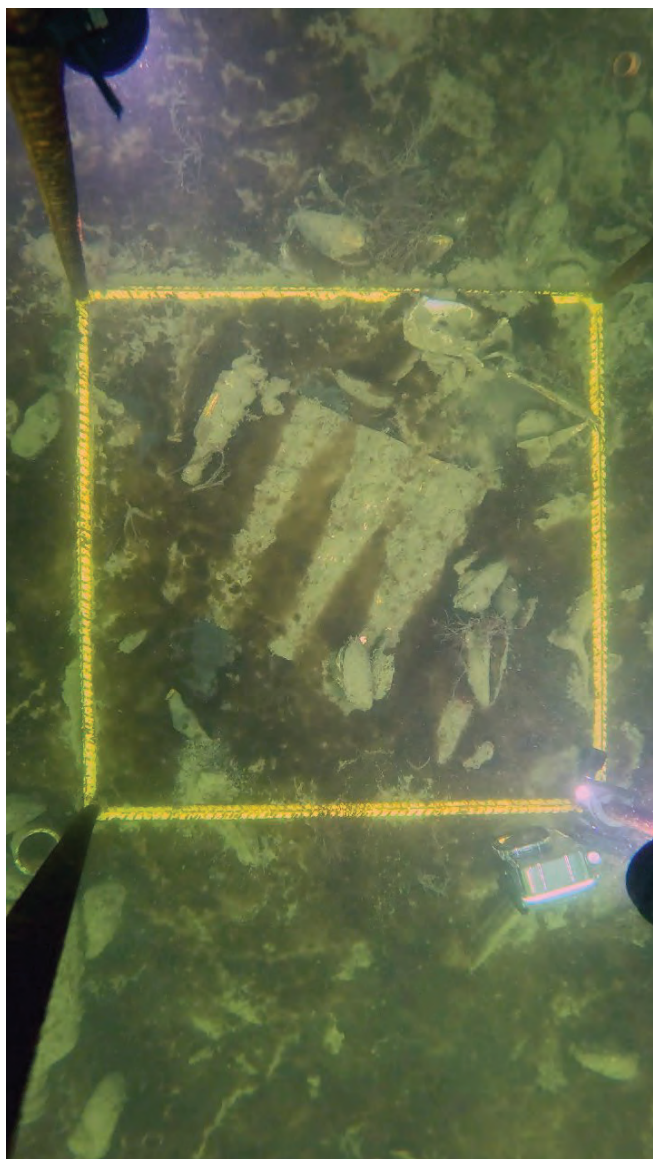


Notes:

Silt and shell rubble with small tufts of attached mixed macroalgae. Located at the mouth of the Fort Point Channel adjacent to the Old Northern Ave Bridge.

Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-2</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.354515</i>	Longitude (NAD83): <i>-71.050530</i>		Water Depth (FT): <i>-11.1</i>	

Plan View

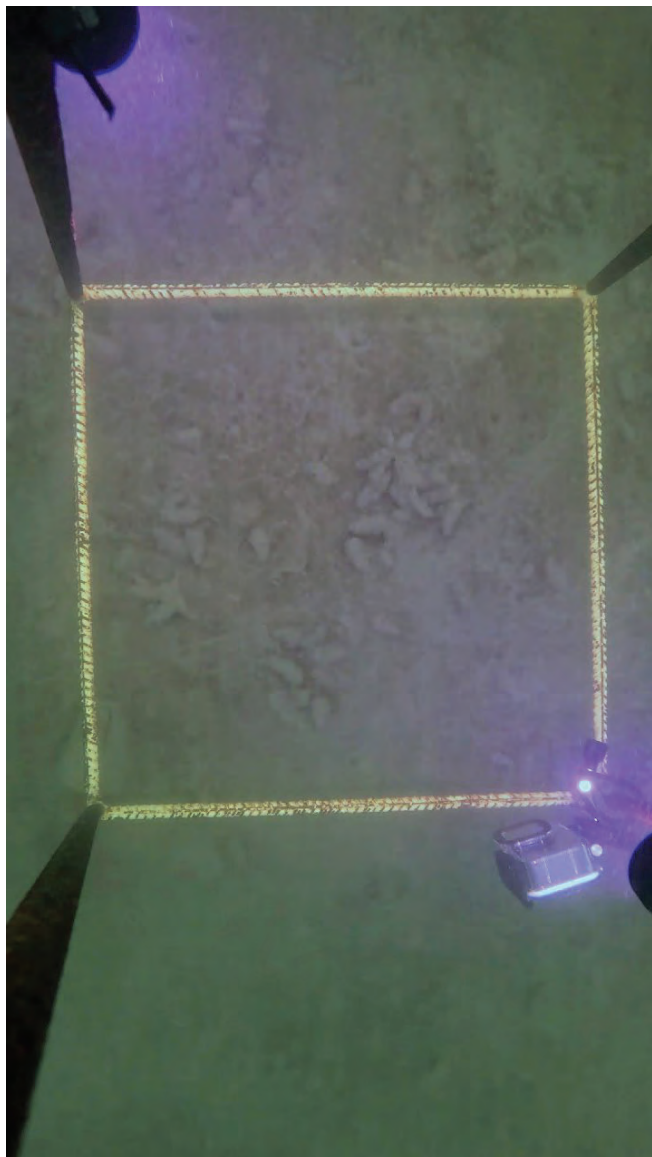
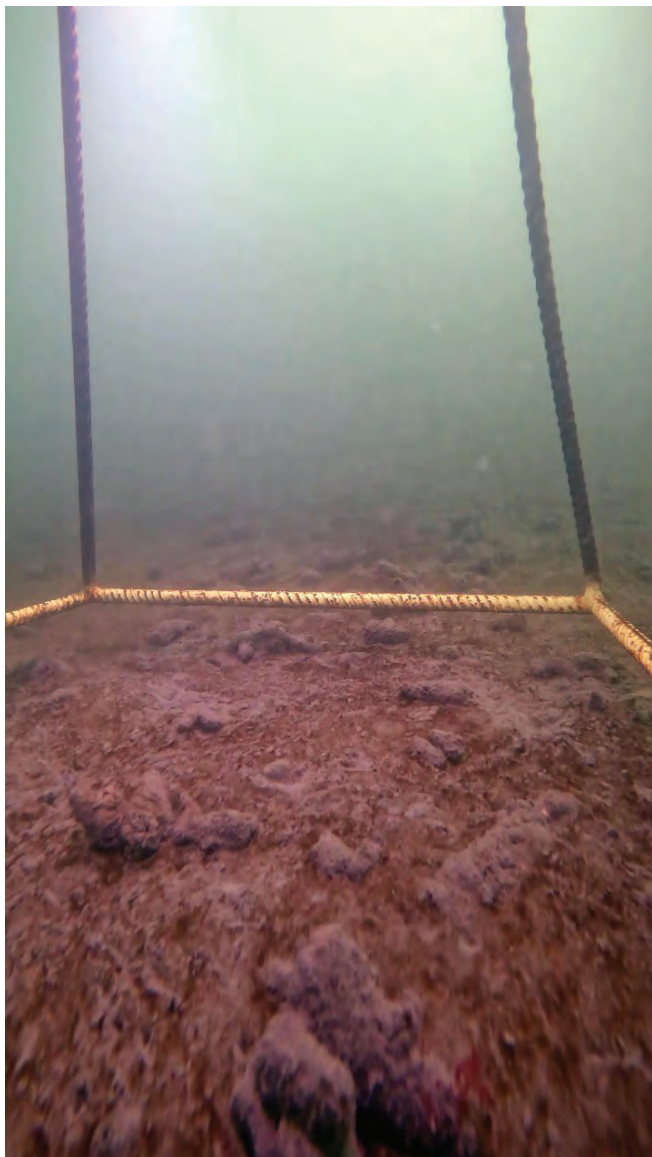


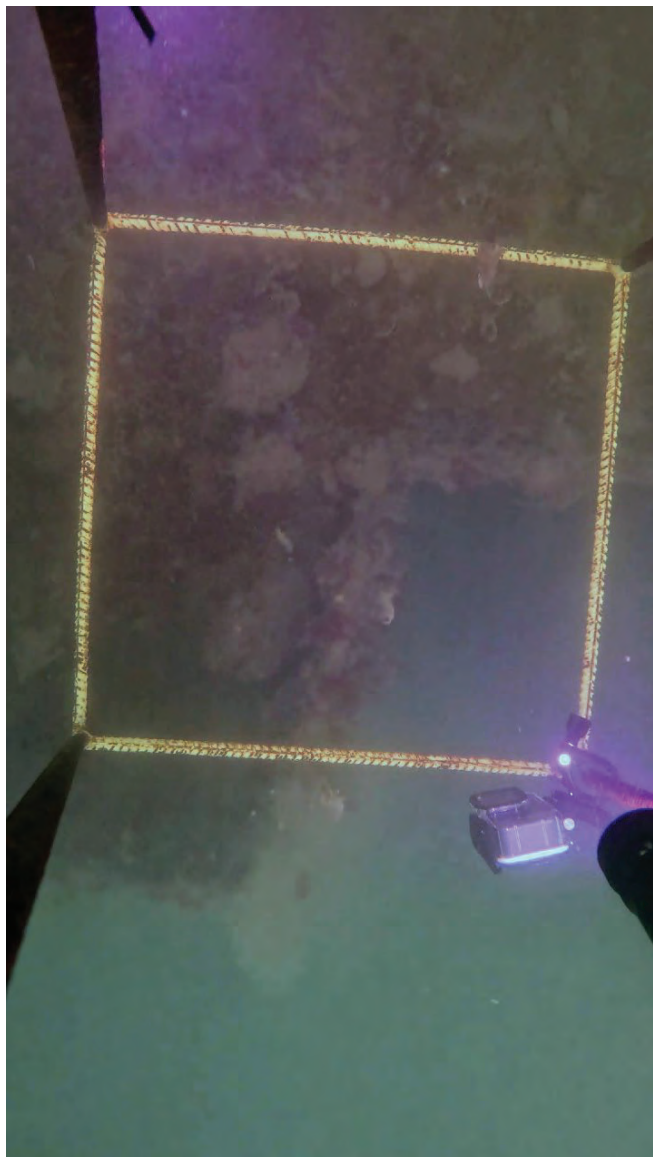
Profile View

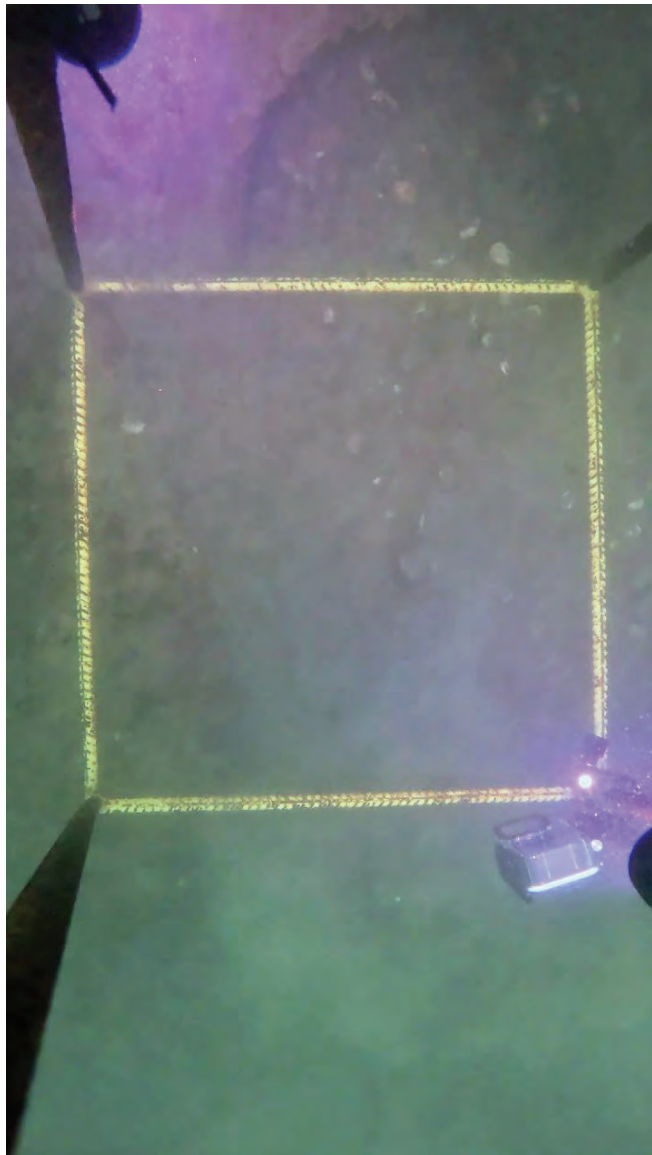


Notes:

Silt with anthropogenic debris, shell rubble, and a dense layer of microbial algae. Trace red bushy ectoprocta (Bugula sp.) present. Located on the western edge of the Fort Point Channel between the Old Northern Ave Bridge and the Seaport Boulevard Bridge.

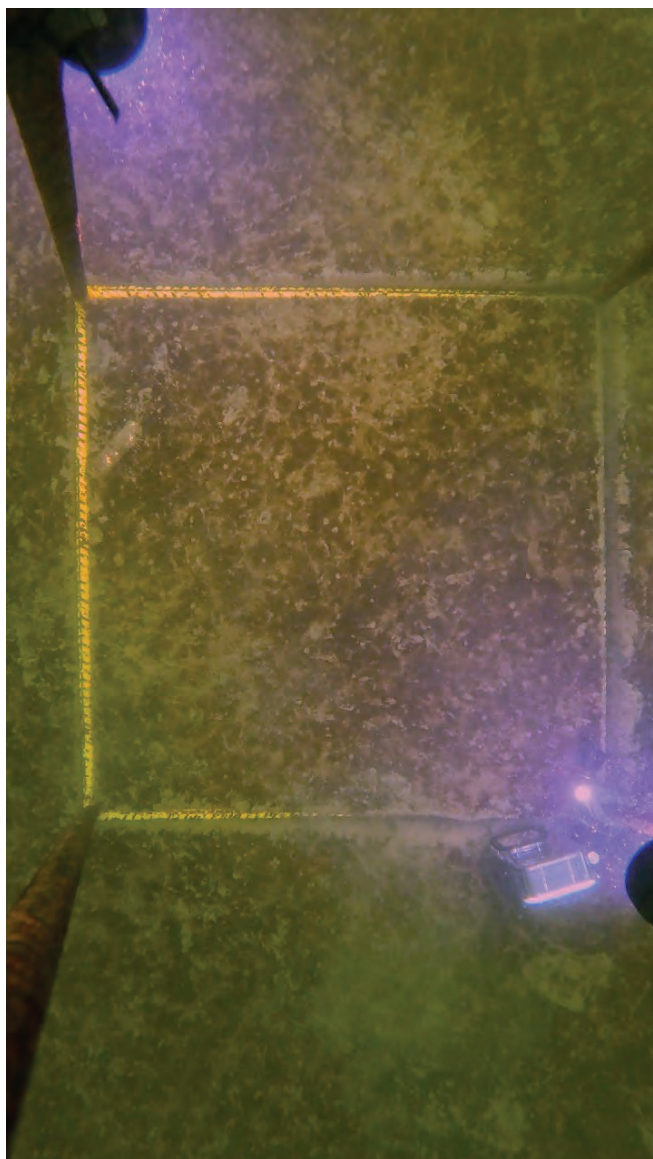
Survey Area:		Fort Point Channel		Transect:	FP-3	Capture:	01
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.353388, -71.050851			Stop Coordinates (NAD83): 42.353139, -71.050924			Water Depth (FT): -19.2	
Plan View				Profile View			
							
Notes:							
MBTA tunnel surface silt with a thin microbial algal mat and moderate density of tunicates (likely Molgulidae sp., Styaela clava, or Asciidiella aspersa) overlying the M. Located between Seaport Boulevard and the Congress Street Bridge.							

Survey Area:		Fort Point Channel		Transect:	FP-3	Capture:	02
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.353388, -71.050851			Stop Coordinates (NAD83): 42.353139, -71.050924			Water Depth (FT): -15.9	
Plan View				Profile View			
							
Notes:							
Southern edge of the MBTA tunnel structure. Large corrugated sheet pile retaining wall with attached macroalgae, tunicates, ectoprocts and/or hydroids. Video captures taken at slightly different moments to enhance view of structure. Located between Seaport Boulevard and the Congress Street Bridge.							

Survey Area:		Fort Point Channel		Transect:	FP-3	Capture:	03
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.353388, -71.050851			Stop Coordinates (NAD83): 42.353139, -71.050924			Water Depth (FT): -17.9	
Plan View				Profile View			
							
Notes: Approximately 50 feet south of the MBTA tunnel. Silt and shells. Large circular metal object (anthropogenic debris) visible in both plan- and prfoile-view images. Algal and macroalgal growth. Located between Seaport Boulevard and the Congress Street Bridge.							

Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-4</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.352721</i>	Longitude (NAD83): <i>-71.051285</i>		Water Depth (FT): <i>-16.5</i>	

Plan View



Profile View

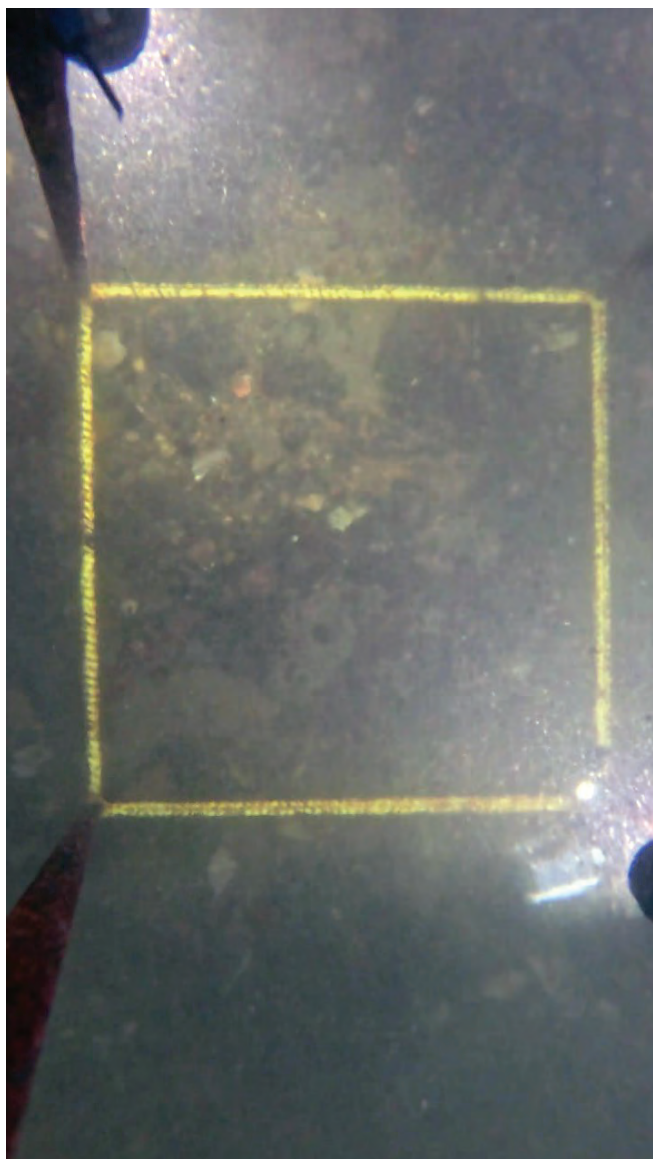


Notes:

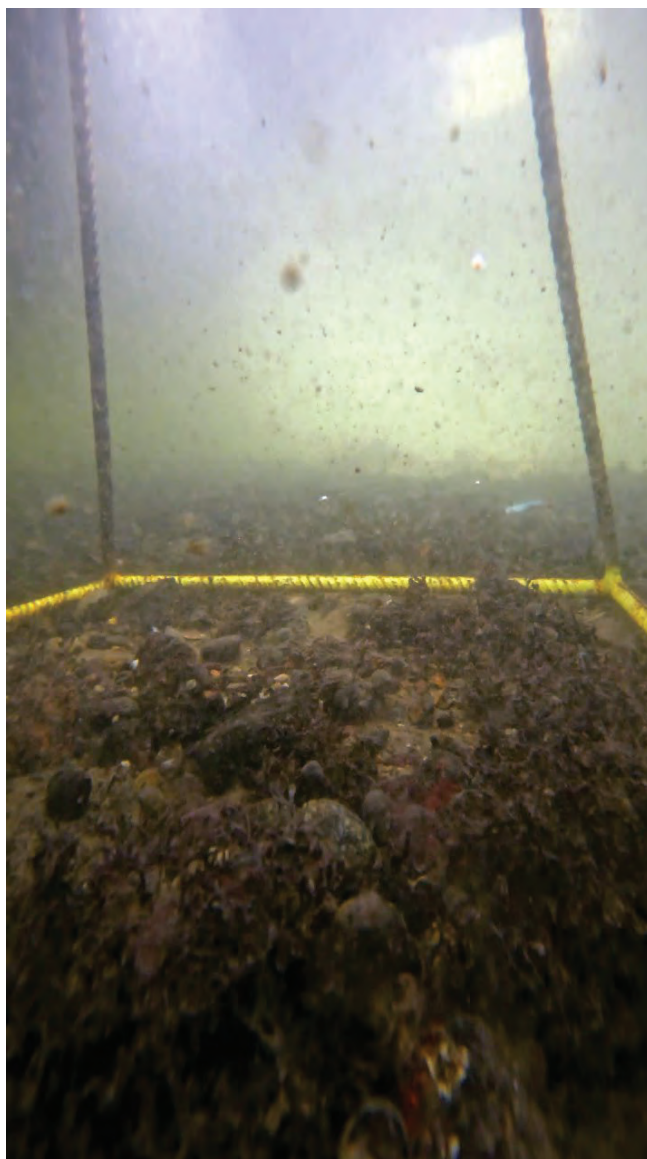
Silt and trace anthropogenic debris with a dense cover of microbial algae. Ambient seafloor adjacent to the Boston Tea Party Ships and Museum.

Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-5</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.351813</i>	Longitude (NAD83): <i>-71.052293</i>		Water Depth (FT): <i>-5.8</i>	

Plan View

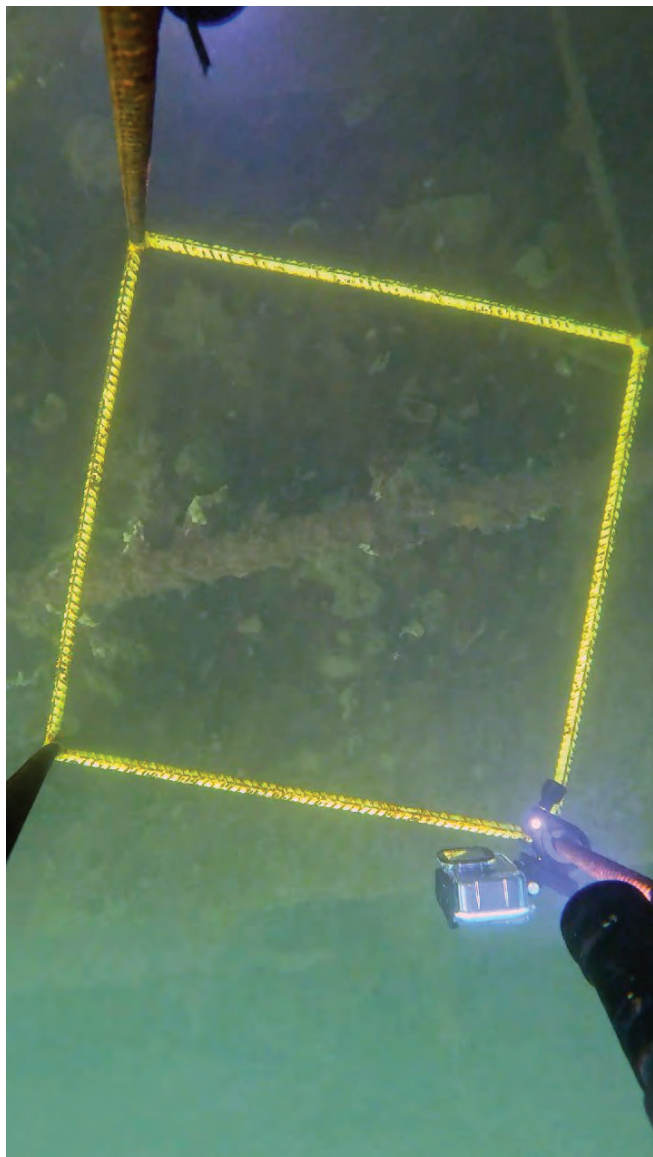


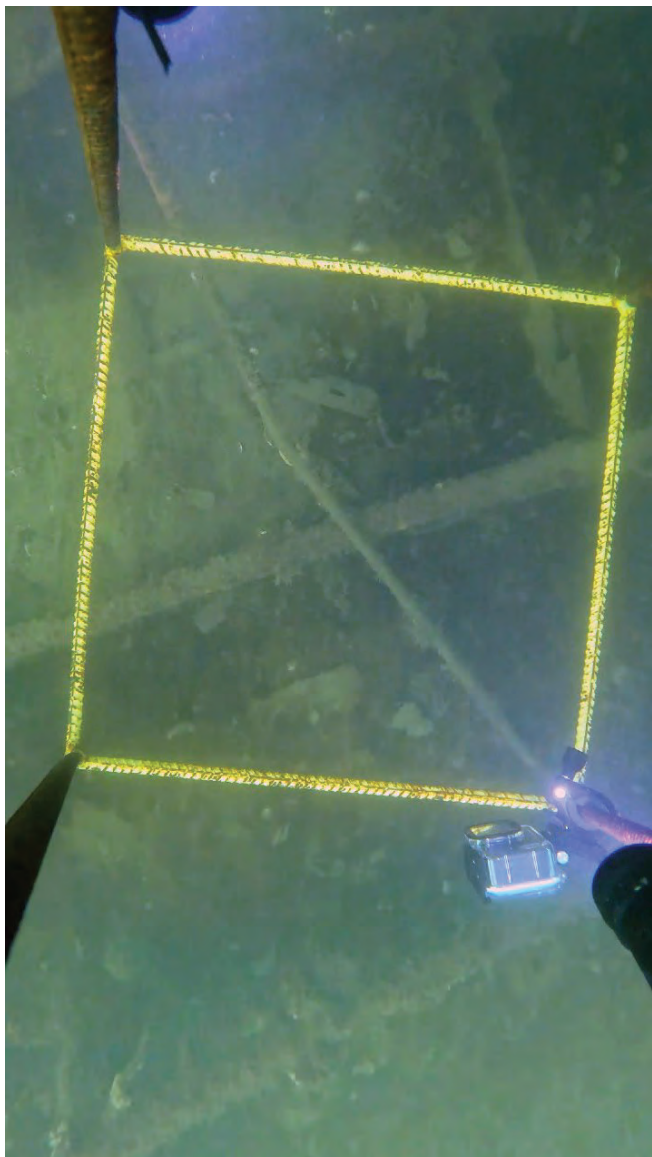
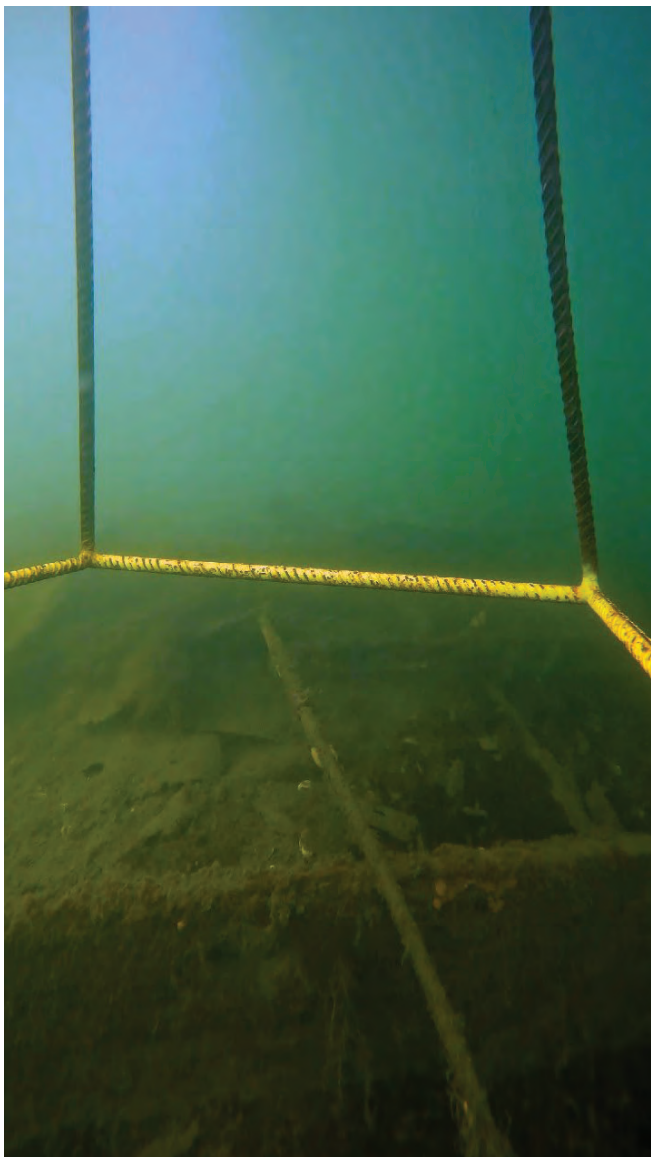
Profile View

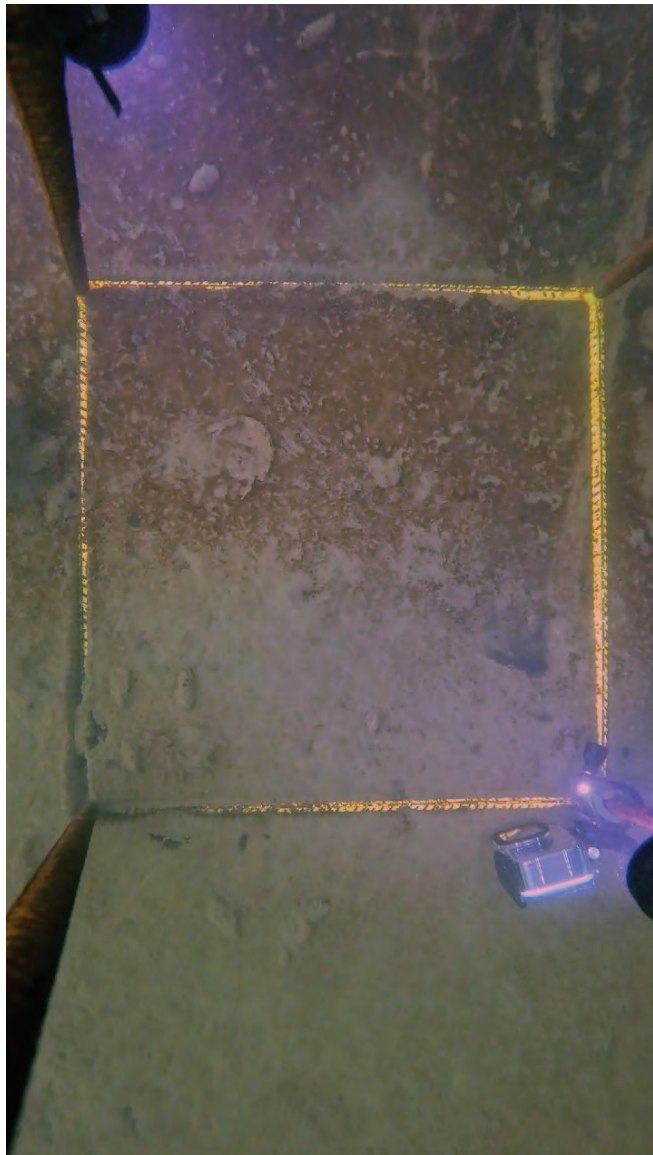


Notes:

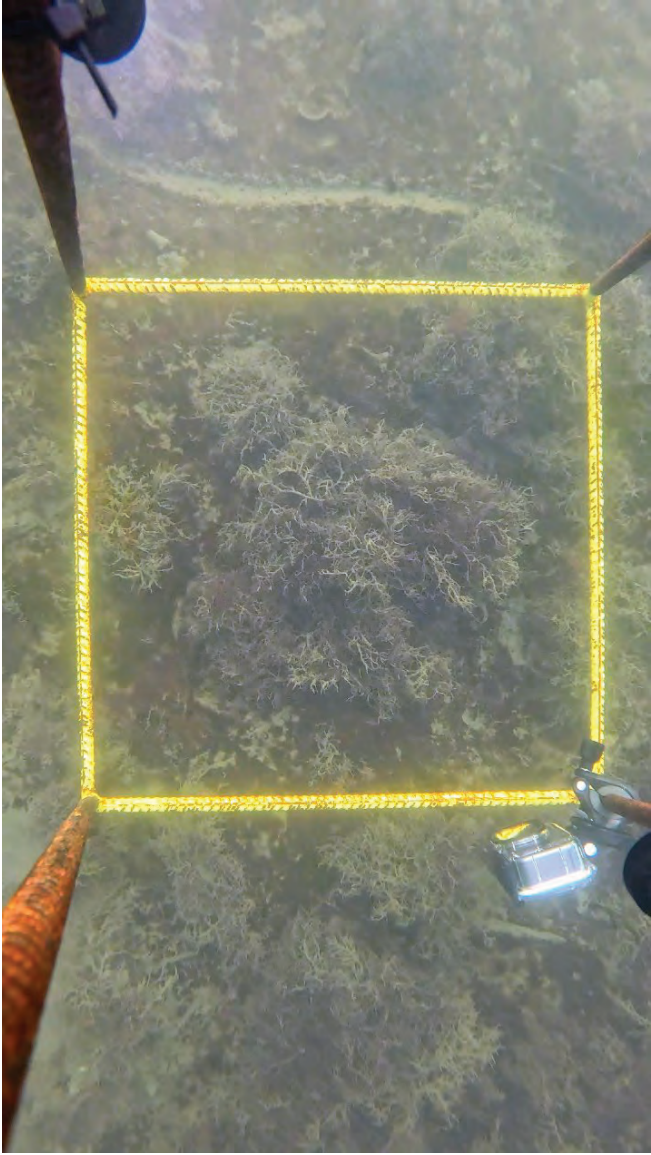
Silty sand and cobbles with a moderate cover of macroalgae. Many periwinkles (Littorina spp.) present. Located on the western edge of the Fort Point Channel near the Federal Reserve Bank.

Survey Area:		Fort Point Channel		Transect:		FP-6		Capture:		01			
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:				0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):				-11.4	
42.350197, -71.052903				42.350126, -71.052902									
Plan View						Profile View							
													
Notes:													
Large sunken metal barge with attached sponges, tunicates, ectoprocts, and hydroids. Located approximately 350 feet south of the Summer Street Bridge.													

Survey Area:		Fort Point Channel		Transect:	FP-6	Capture:	02
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.350197, -71.052903			Stop Coordinates (NAD83): 42.350126, -71.052902			Water Depth (FT): -10.6	
Plan View				Profile View			
							
Notes:							
Large sunken metal barge with attached sponges, tunicates, ectoprocts, and hydroids. Located approximately 350 feet south of the Summer Street Bridge.							

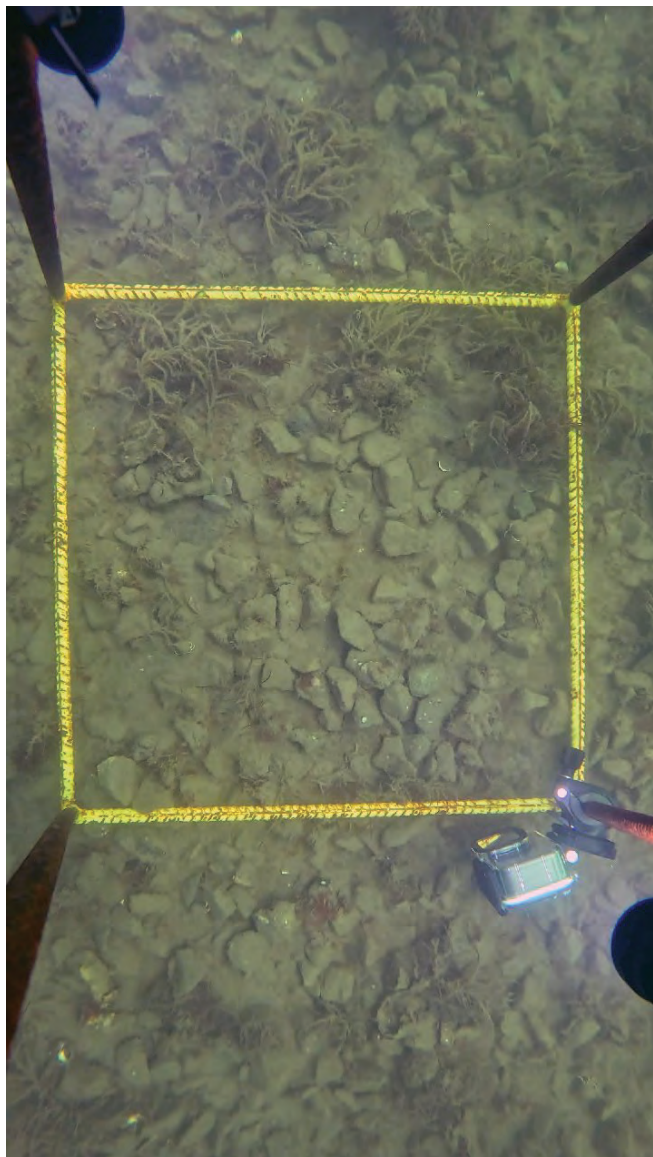
Survey Area:		Fort Point Channel		Transect:	FP-6	Capture:	03
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.350197, -71.052903			Stop Coordinates (NAD83): 42.350126, -71.052902			Water Depth (FT): -13.3	
Plan View				Profile View			
							
Notes: Ambient silt seafloor adjacent to the sunken barge. A thin microbial algal mat and anthropogenic debris present. Infaunal invertebrate burrows and bioturbated sediments present. Located approximately 350 feet south of the Summer Street Bridge.							

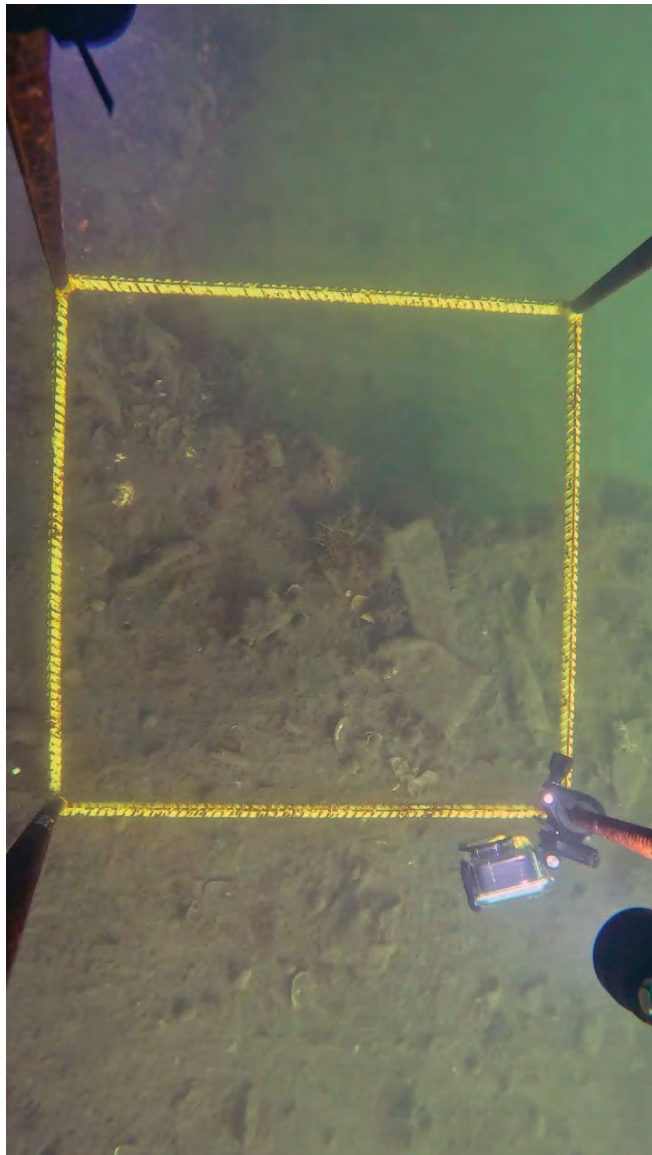
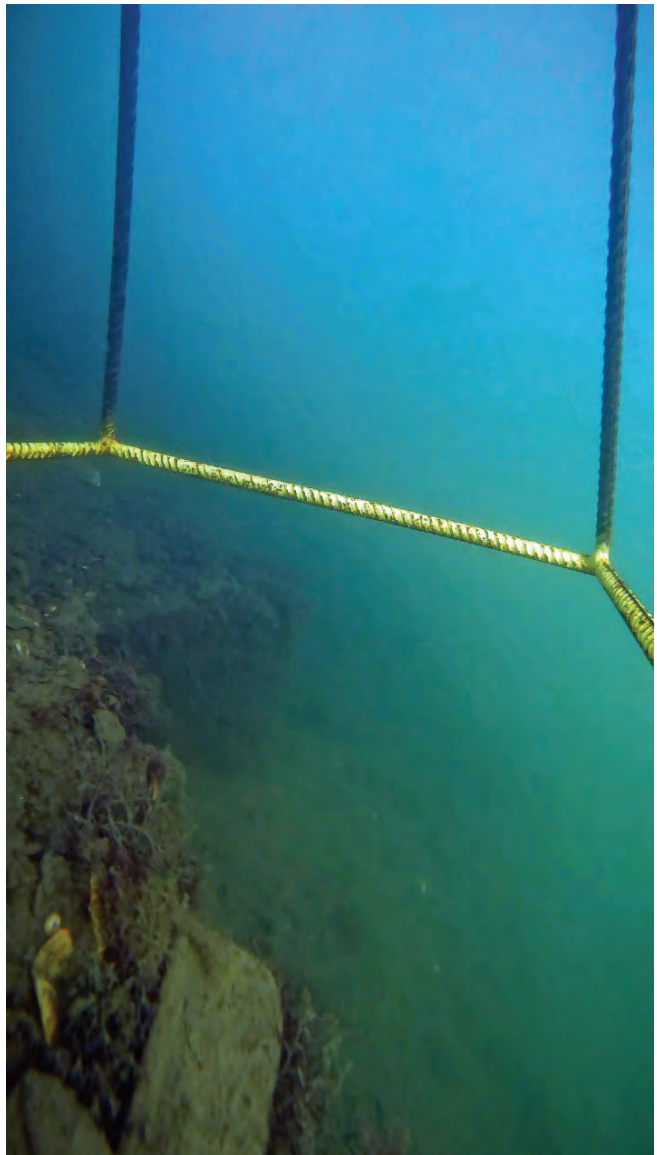
Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-7</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.350070</i>	Longitude (NAD83): <i>-71.053392</i>		Water Depth (FT): <i>-7.4</i>	

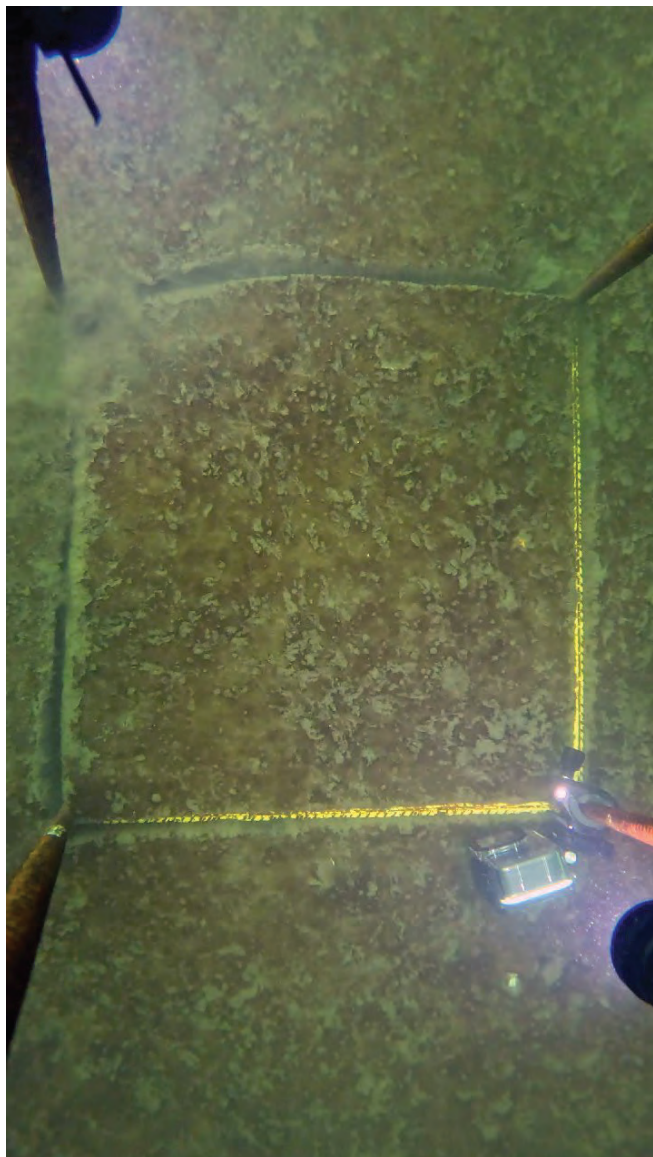
Plan View	Profile View
	

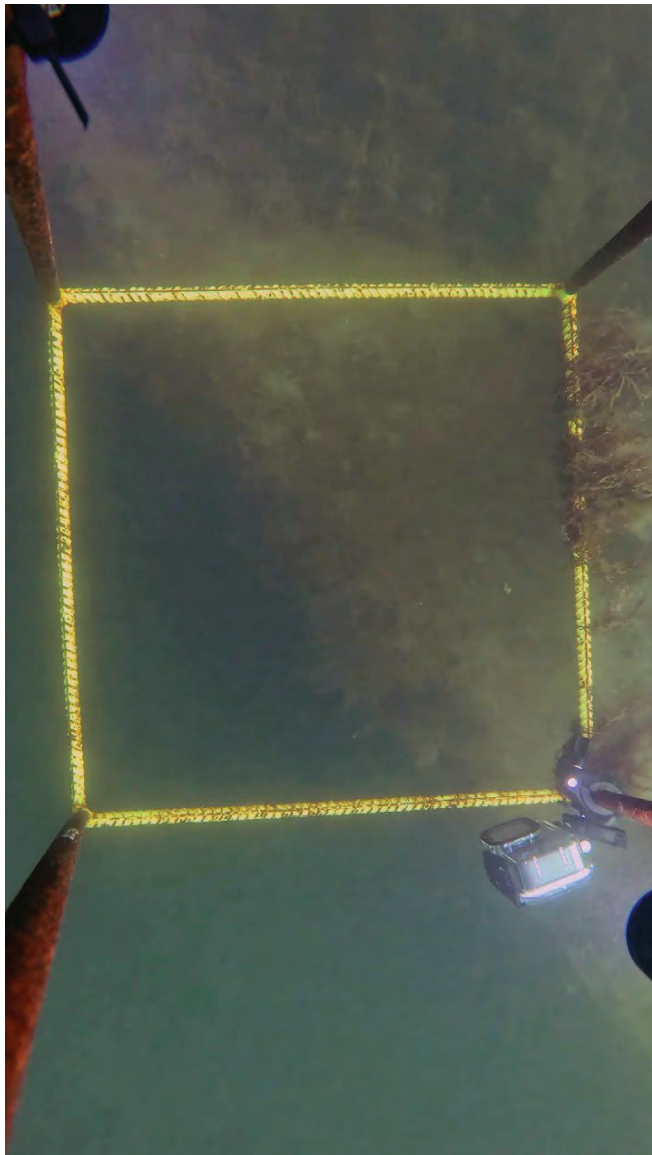
Notes:

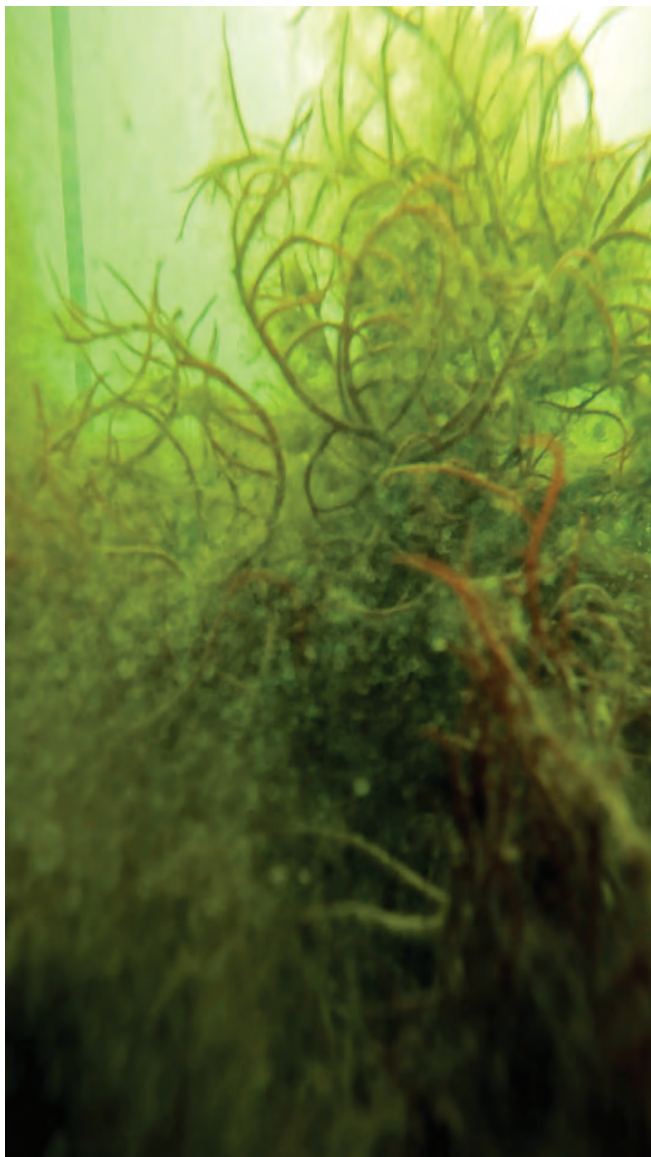
Silt with a dense cover of microbial algae and filamentous macroalgae. Epifaunal invertebrate tracks visible in plan-view image. Located on the western edge of the Fort Point Channel, approximately 450 feet south of the Summer Street Bridge.

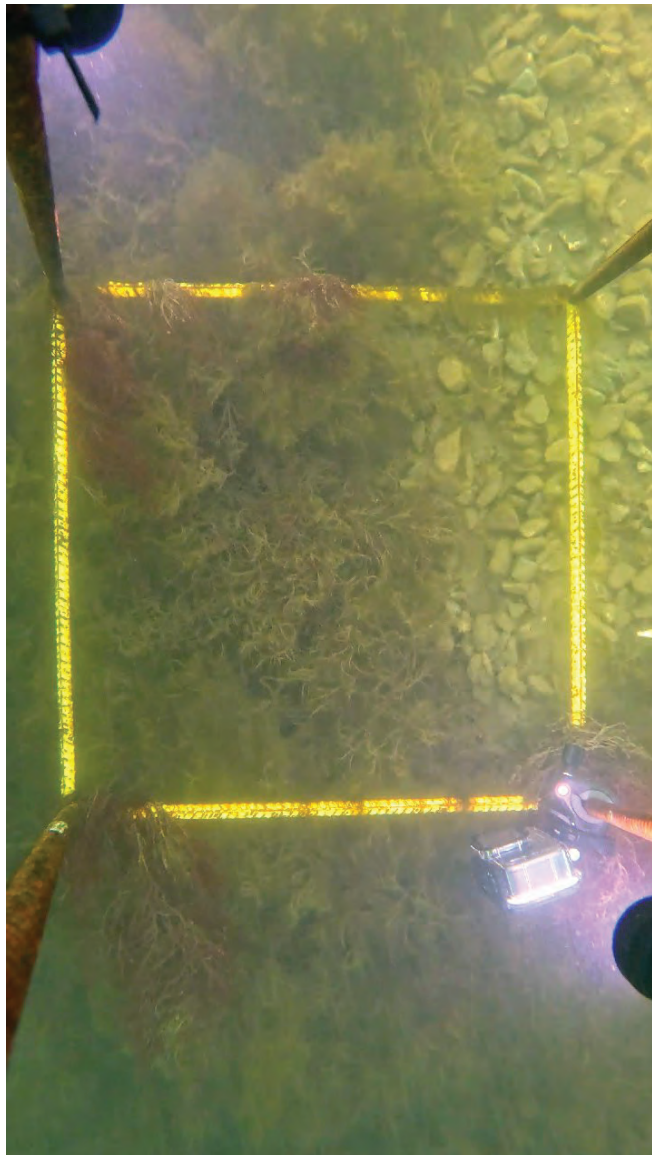
Survey Area:		Fort Point Channel		Transect:	FP-8	Capture:	01
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.348469, -71.054460			Stop Coordinates (NAD83): 42.348675, -71.054432			Water Depth (FT): -8.8	
Plan View				Profile View			
							
Notes:							
Gravel with attached mixed macroalgae. Located on the western edge of Fort Point Channel between Summer Street and the Fort Point Channel Tunnel.							

Survey Area:		Fort Point Channel		Transect:	FP-8	Capture:	02	
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:				0.25m ² drop frame - plan and profile cameras
Start Coordinates (NAD83):			Stop Coordinates (NAD83):			Water Depth (FT):		
42.348469, -71.054460			42.348675, -71.054432			-7.5		
Plan View				Profile View				
								
Notes:								
Edge of large sheet pile retaining wall with overlying silt, anthropogenic debris, and shell hash/ rubble. Trace filamentous macroalgae present. Located on the western edge of Fort Point Channel between Summer Street and the Fort Point Channel Tunnel (Interstate 90).								

Survey Area:		Fort Point Channel		Transect:	FP-9	Capture:	01
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.347433, -71.054957			Stop Coordinates (NAD83): 42.346899, -71.055060			Water Depth (FT): -19.7	
Plan View				Profile View			
							
Notes:							
Silt with dense cover of microbial algae. Located just north of the Fort Point Channel Tunnel (Central Artery/Tunnel Project; built in 1994).							

Survey Area:		Fort Point Channel		Transect:	FP-9	Capture:	02
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.347433, -71.054957			Stop Coordinates (NAD83): 42.346899, -71.055060			Water Depth (FT): -9.9	
Plan View				Profile View			
							
Notes: Concrete tunnel tube scoured and exposed above ambient seafloor to the north. Concrete substrate with a think layer of silt, microbial algae, and filamentous macroalgae. Located on the northern edge of the Fort Point Channel Tunnel.							

Survey Area:		Fort Point Channel		Transect:	FP-9	Capture:	03
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.347433, -71.054957			Stop Coordinates (NAD83): 42.346899, -71.055060			Water Depth (FT): -10.0	
Plan View				Profile View			
							
Notes: Concrete substrate with a thick layer of mixed macroalgae and microbial algae. Located on top of the Fort Point Channel Tunnel.							

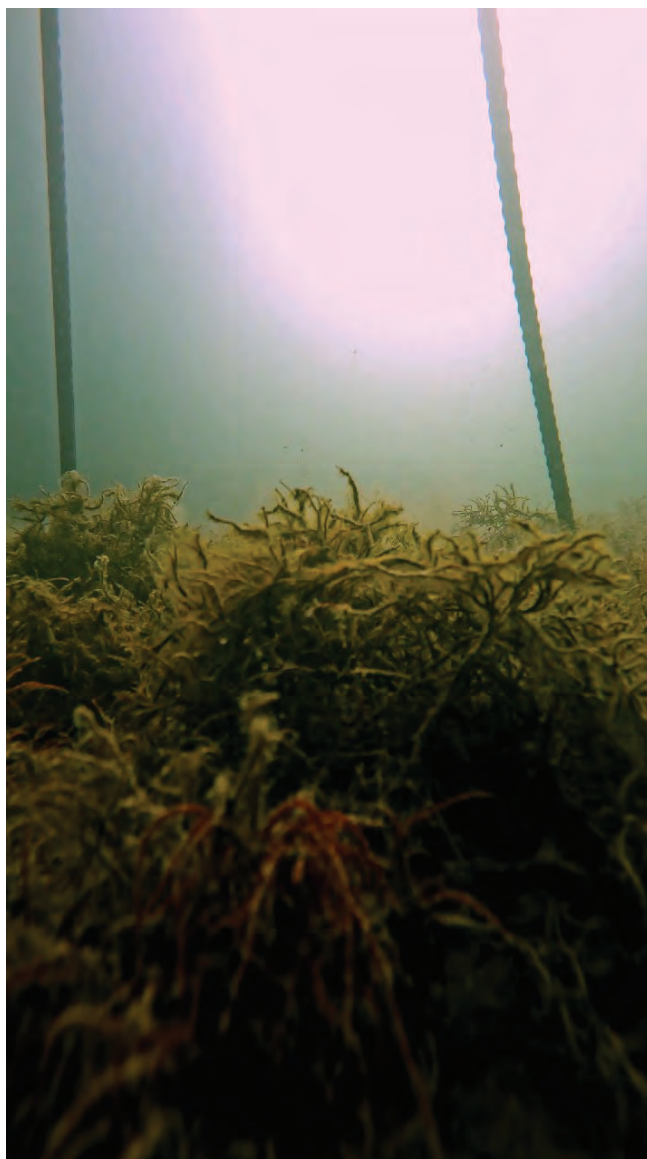
Survey Area:		Fort Point Channel		Transect:	FP-9	Capture:	04
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.347433, -71.054957			Stop Coordinates (NAD83): 42.346899, -71.055060			Water Depth (FT): -9.7	
Plan View				Profile View			
							
Notes: Gravel with a moderate cover of filamentous macroalgae. Located on the southern edge of the westbound tube/ northern edge of the eastbound tube sections of the Fort Point Channel Tunnel.							

Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-10</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.345884</i>	Longitude (NAD83): <i>-71.055464</i>		Water Depth (FT): <i>-11.0</i>	

Plan View

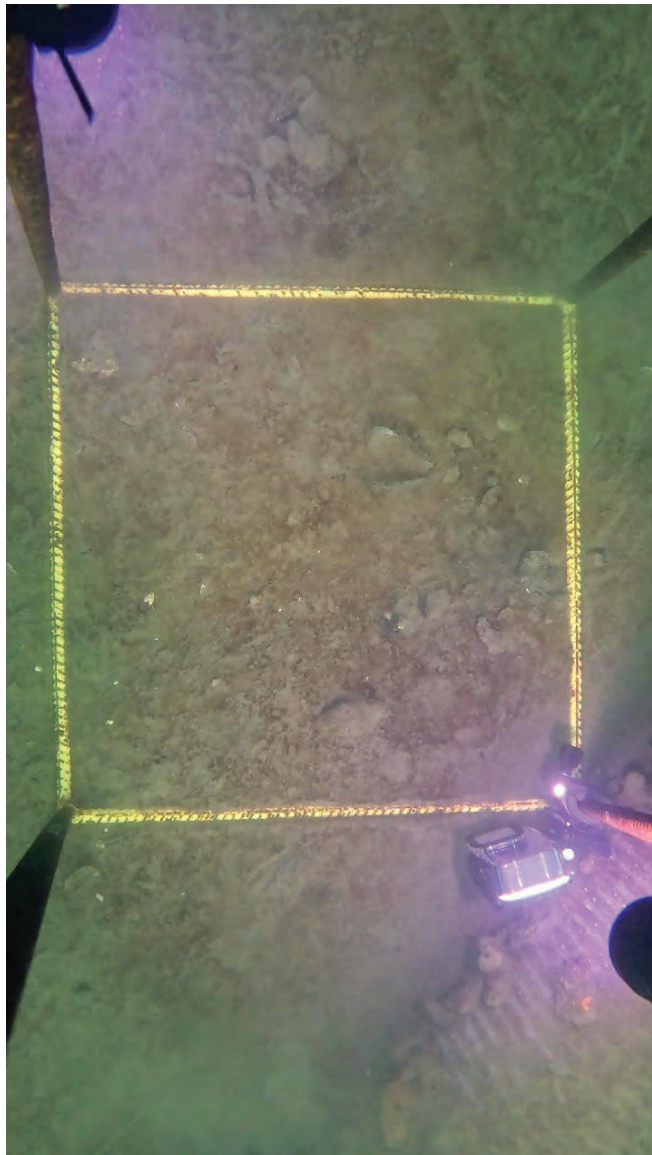


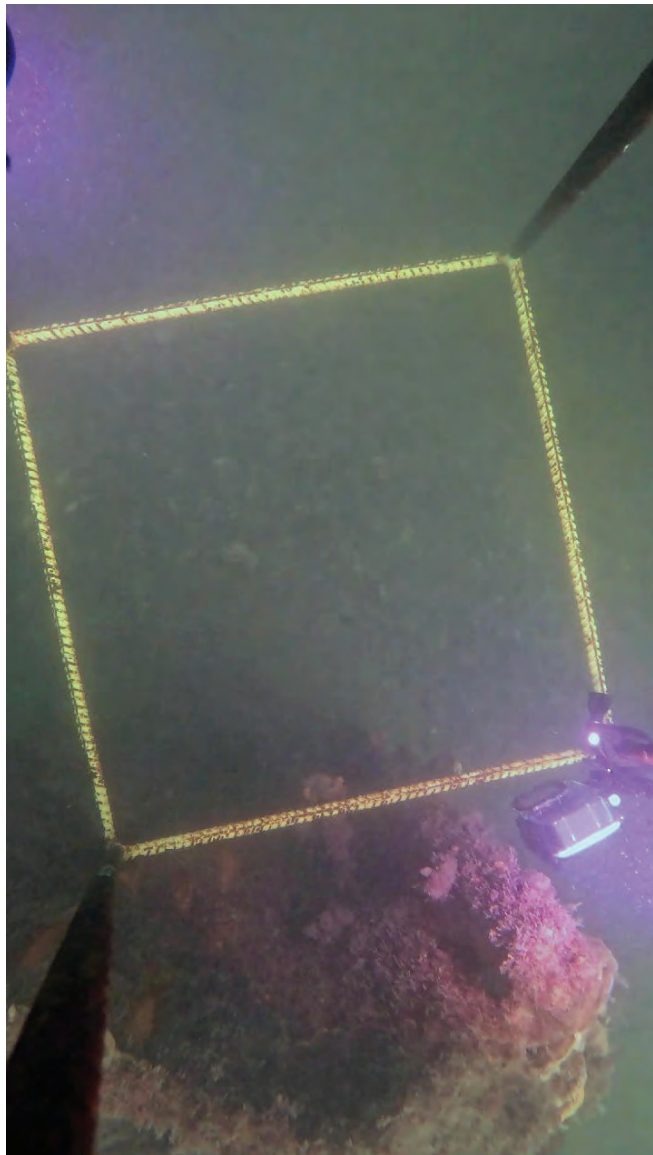
Profile View

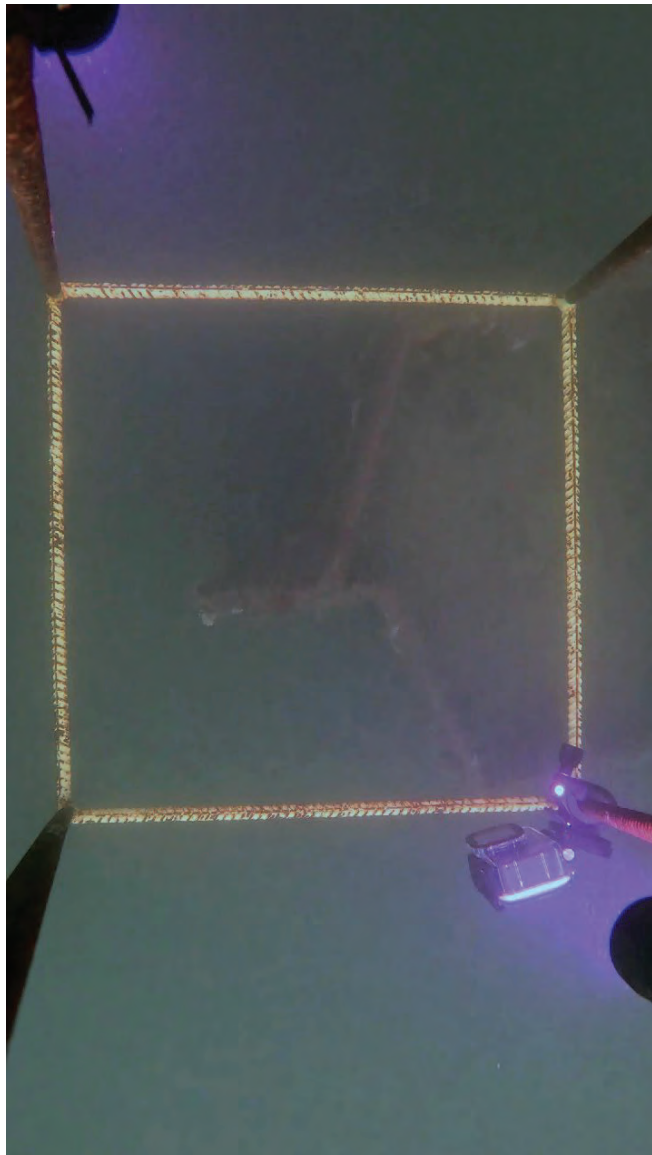


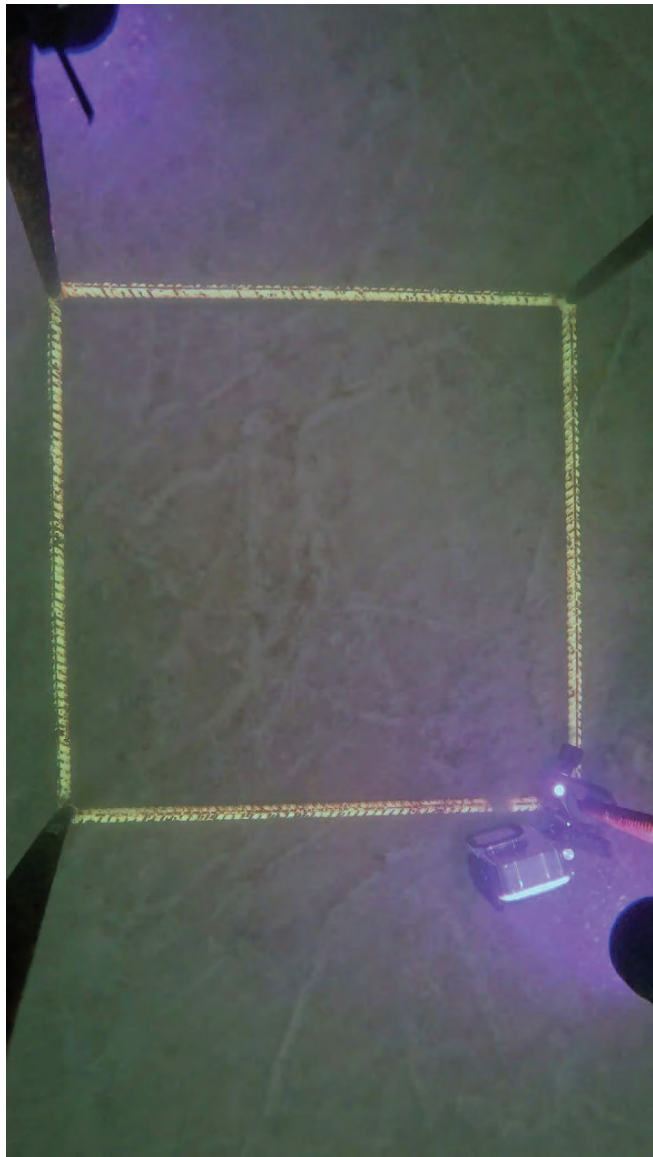
Notes:

Silt with a dense to complete cover of mixed macroalgae and microbial algae. Located on the southern extent of the Fort Point Channel near the Gillette HQ parking lot.

Survey Area:		Fort Point Channel		Transect:	FP-11	Capture:	01
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.347992, -71.053582			Stop Coordinates (NAD83): 42.348037, -71.053444			Water Depth (FT):	-19.6
Plan View				Profile View			
							
Notes:							
Silt and shells with a thin cover of microbial algae and several tunicates (likely Molgulidae spp.). Corrugated metal pipe with attached tunicates and sponges visible in plan-view image. Several tunicates are also attached to shell rubble. These structures are part of a combined sewer overflow (CSO) outfall adjacent to an MWRA stormwater station on the eastern edge of the Fort Point Channel.							

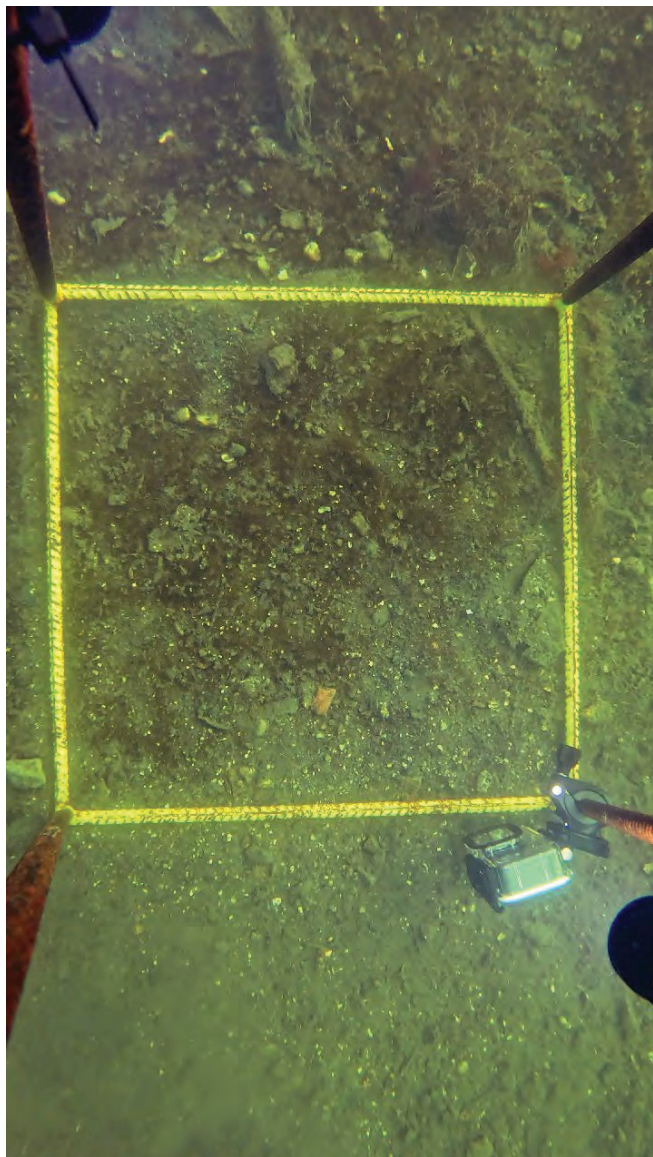
Survey Area:		Fort Point Channel		Transect:	FP-11	Capture:	02
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.347992, -71.053582			Stop Coordinates (NAD83): 42.348037, -71.053444			Water Depth (FT): -19.6	
Plan View				Profile View			
							
Notes: Silt with shells and large anthropogenic structure including a fallen wooden piling. Structures covered with tunicates, sponges, ectoprocts, and hydroids. These features are adjacent to the Gillette cooling water intake structure on the eastern edge of the Fort Point Channel.							

Survey Area:		Fort Point Channel		Transect:		FP-11		Capture:		03			
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:				0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):				-21.5	
42.347992, -71.053582				42.348037, -71.053444									
Plan View						Profile View							
													
Notes:													
Sheet pile projecting into the waterway adjacent to the Gillette cooling water intake structure on the eastern edge of the Fort Point Channel. The structure was covered in encrusting tunicates (likely Didemnum sp.) and/or sponges. Video captures taken at slightly different moments to enhance view of structure.													

Survey Area:		Fort Point Channel		Transect:		FP-11		Capture:		04			
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:				0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):				-21.5	
42.347992, -71.053582				42.348037, -71.053444									
Plan View						Profile View							
													
Notes:													
Bare silt with a thin layer of microbial algae and epifaunal invertebrate tracks. Ambient seafloor adjacent to the Gillette cooling water intake structure on the eastern edge of the Fort Point Channel.													

Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-12</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.349922</i>	Longitude (NAD83): <i>-71.051858</i>		Water Depth (FT): <i>-14.3</i>	

Plan View

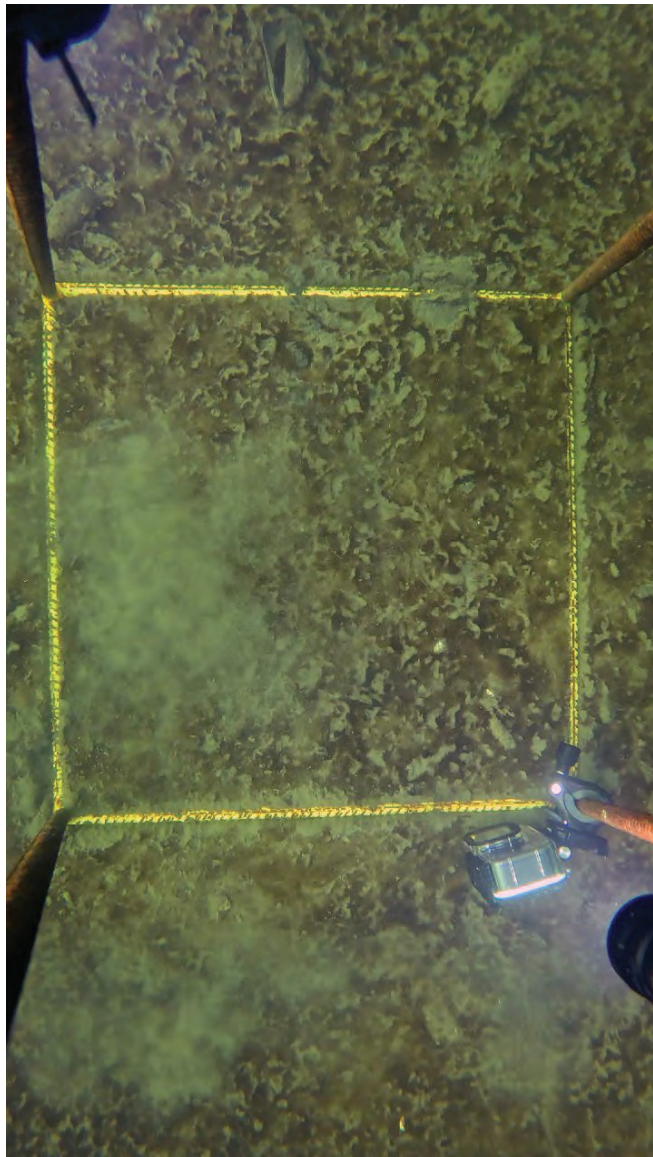


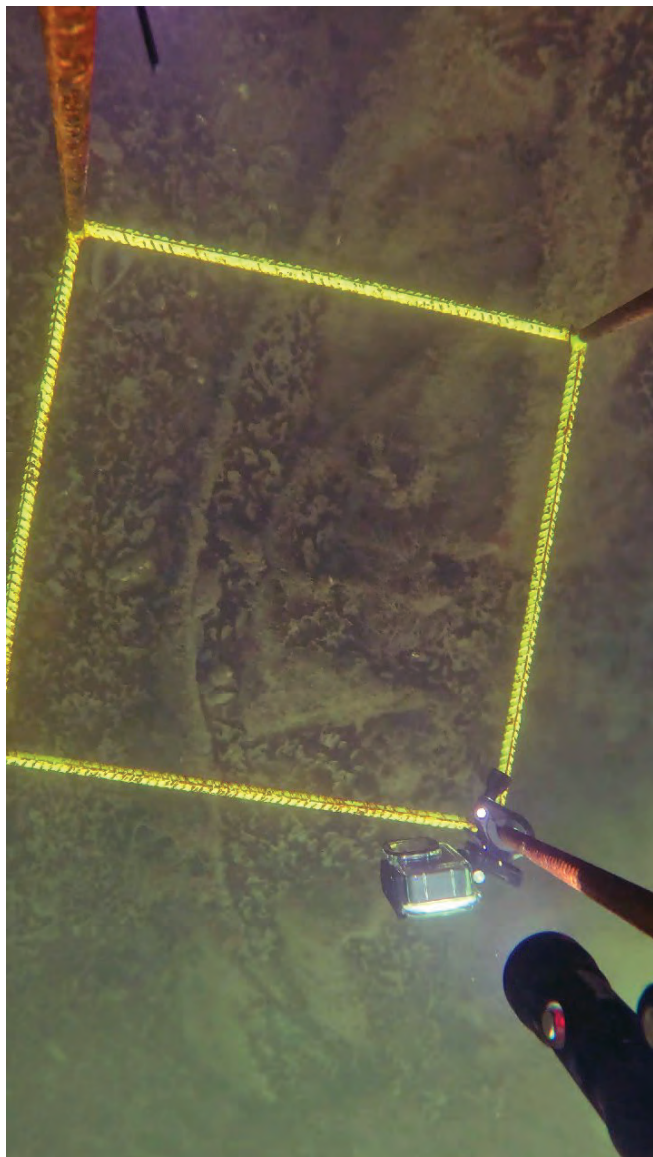
Profile View

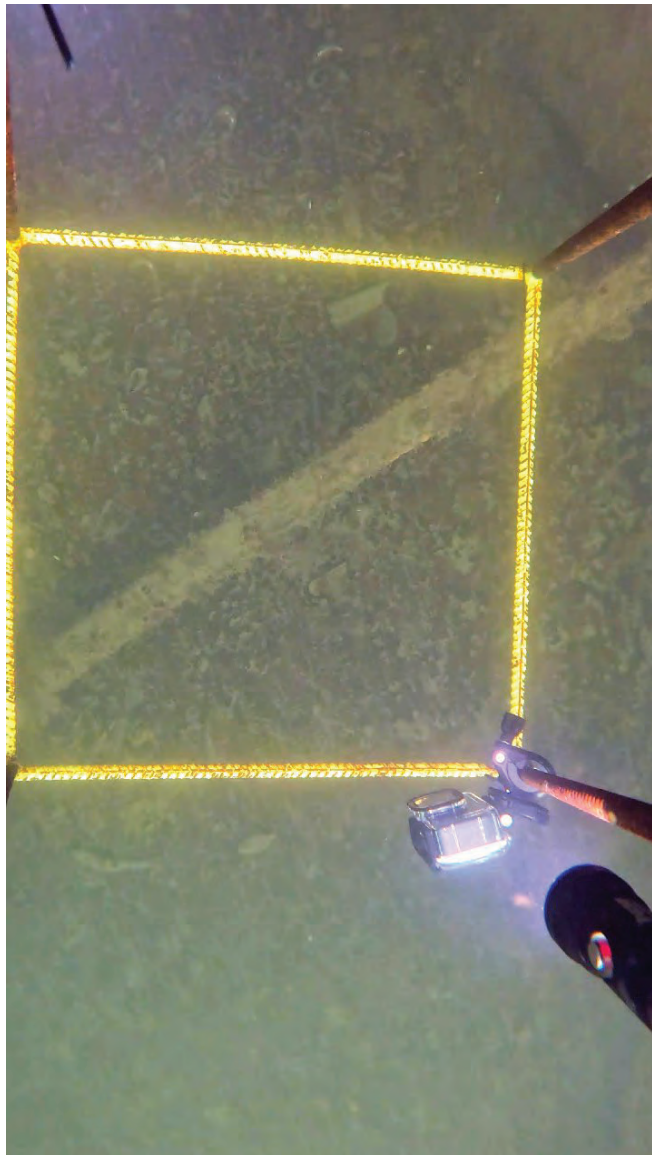


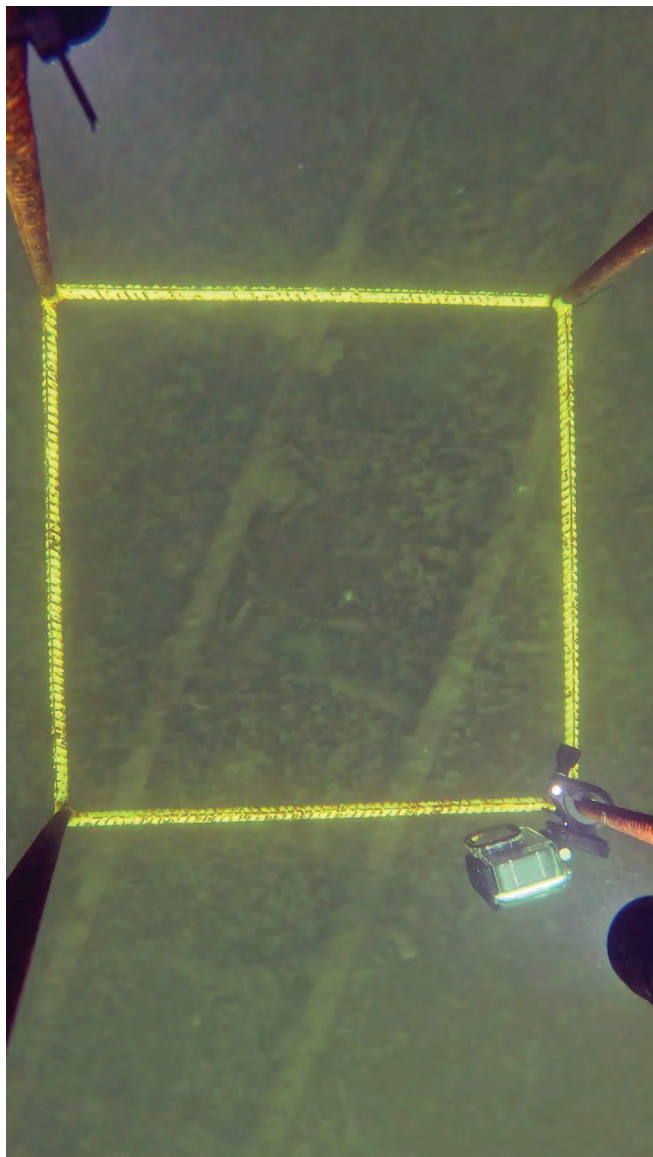
Notes:

Gravel with shell hash/rubble, anthropogenic debris, and a thin layer of microbial algae. Located on the eastern edge of the Fort Point Channel adjacent to Fan Point Pier.

Survey Area:		Fort Point Channel		Transect:		FP-13		Capture:		01			
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:				0.25m ² drop frame - plan and profile cameras	
Start Coordinates (NAD83):				Stop Coordinates (NAD83):				Water Depth (FT):				-10.9	
42.352554, -71.049784				42.352605, -71.049833									
Plan View						Profile View							
													
Notes:													
Silt with shell hash/rubble, anthropogenic debris, and a thick layer of microbial algae. Located on the eastern edge of Fort Point Channel adjacent to Martin's Park.													

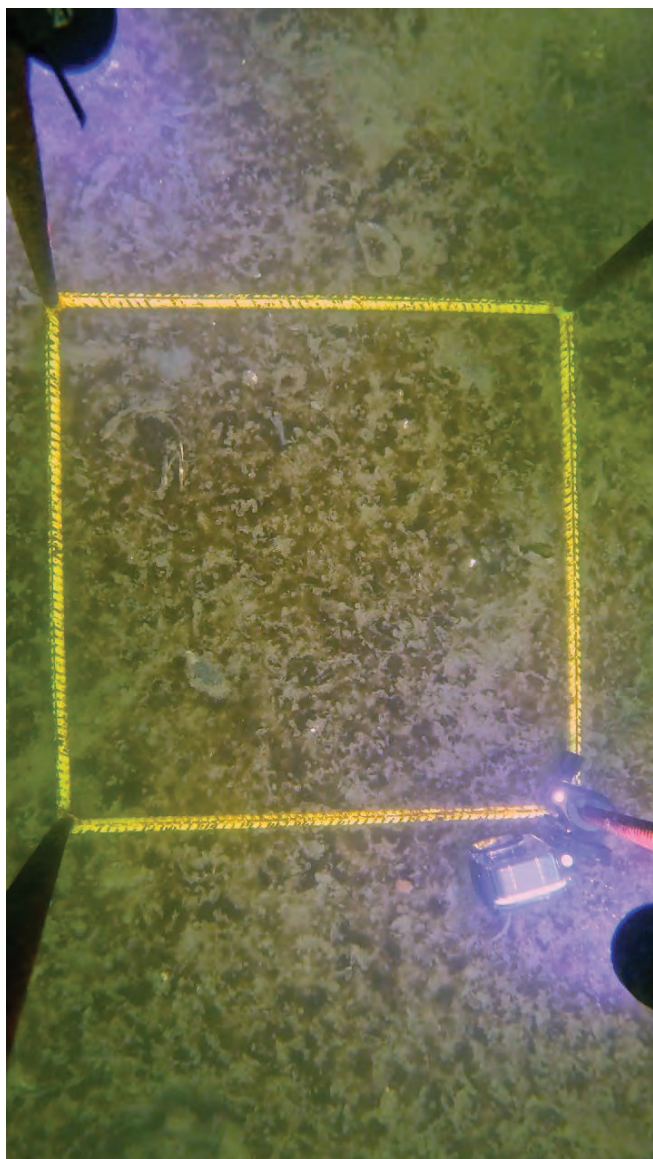
Survey Area:		Fort Point Channel		Transect:	FP-13	Capture:	02
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.352554, -71.049784			Stop Coordinates (NAD83): 42.352605, -71.049833			Water Depth (FT):	-10.9
Plan View				Profile View			
							
Notes:							
Indeterminate anthropogenic debris (possibly heavy fabric) with dense cover of microbial algae and sparse small tufts of filamentous macroalgae. Located on the eastern edge of Fort Point Channel adjacent to Martin's Park.							

Survey Area:		Fort Point Channel		Transect:	FP-13	Capture:	03
Date:	10/26/2023	Vessel:	R/V Nomad	Platform: 0.25m ² drop frame - plan and profile cameras			
Start Coordinates (NAD83): 42.352554, -71.049784			Stop Coordinates (NAD83): 42.352605, -71.049833			Water Depth (FT): -14.4	
Plan View				Profile View			
							
Notes: Silt with a thick cover of microbial algae and scattered anthropogenic debris. Elongated metal rail visible in both plan- and profile-view images. Located on the eastern edge of Fort Point Channel adjacent to Martin's Park.							

Survey Area:		Fort Point Channel		Transect:	FP-13	Capture:	04
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.352554, -71.049784			Stop Coordinates (NAD83): 42.352605, -71.049833			Water Depth (FT): -14.4	
Plan View				Profile View			
							
Notes:							
Silt with a thick cover of microbial algae and scattered anthropogenic debris. Two parrallel metal rails visible in plan-view image. Located on the eastern edge of Fort Point Channel adjacent to Martin's Park.							

Survey Area: <i>Fort Point Channel</i>			Station: <i>FP-14</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.354645</i>	Longitude (NAD83): <i>-71.048761</i>		Water Depth (FT): <i>-16.9</i>	

Plan View



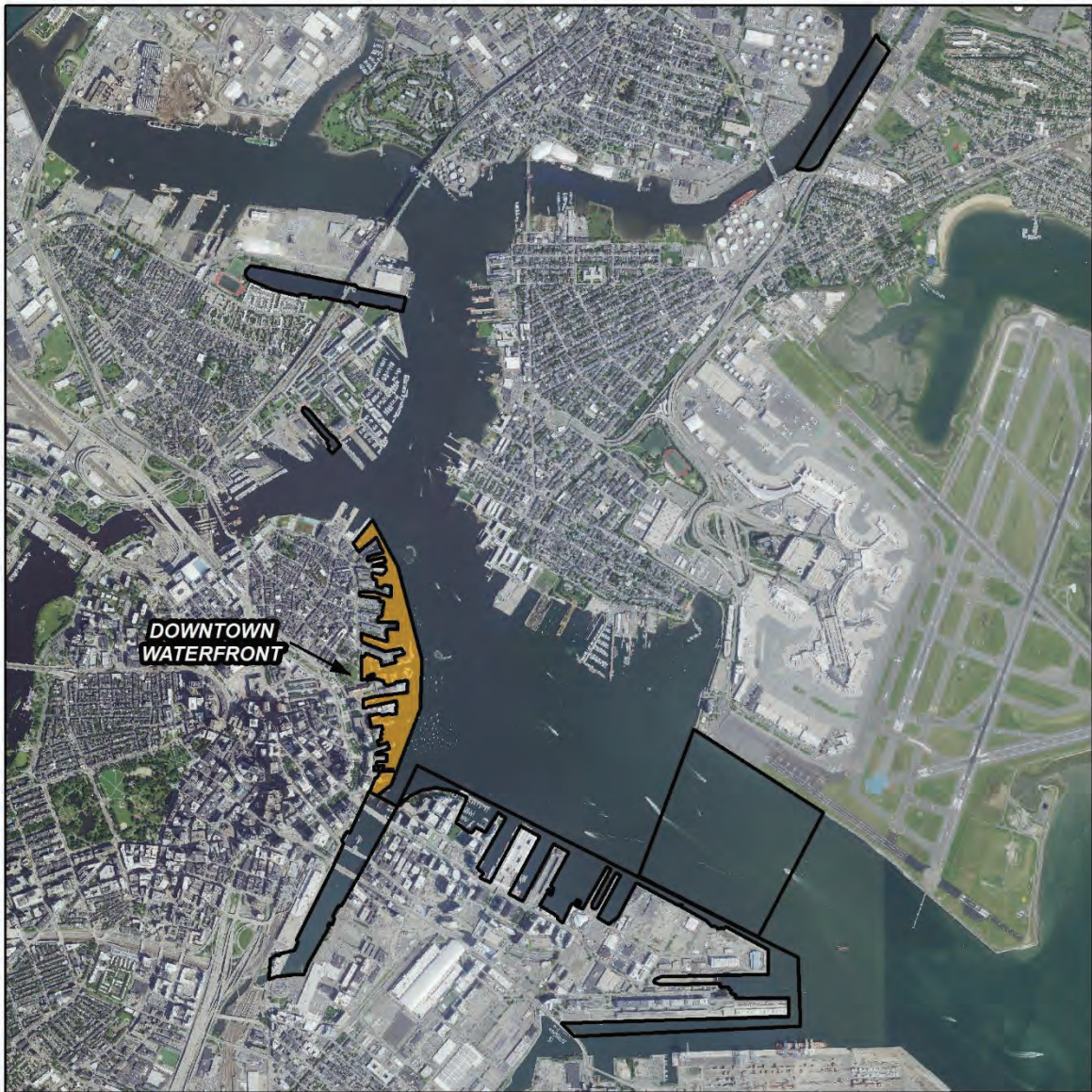
Profile View

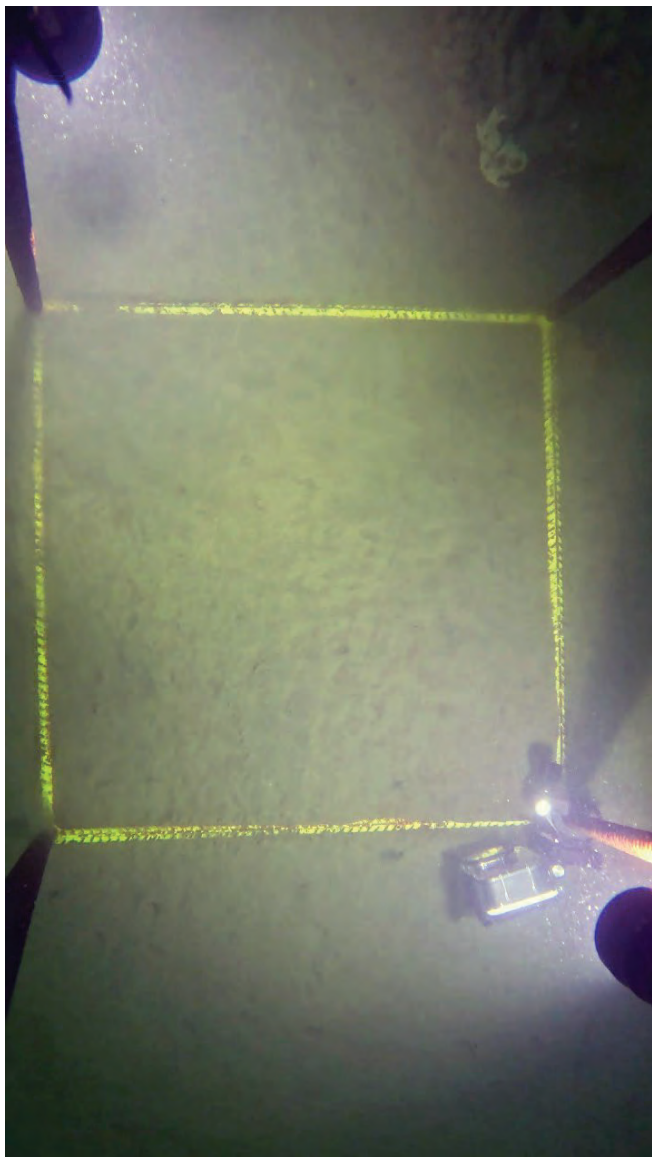
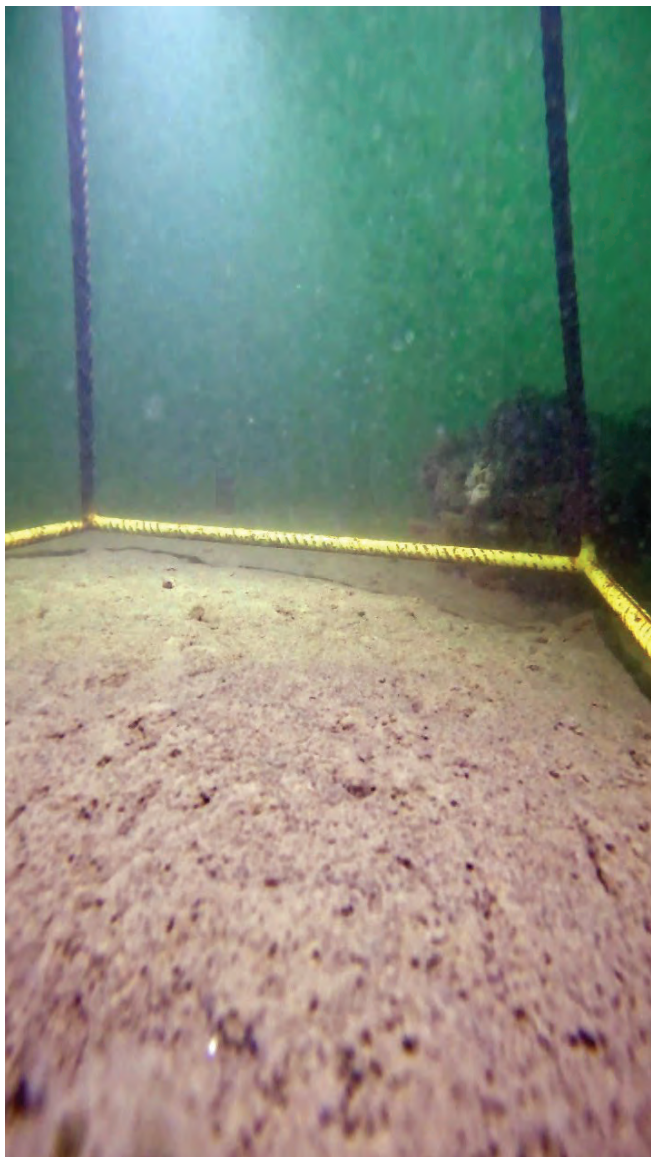


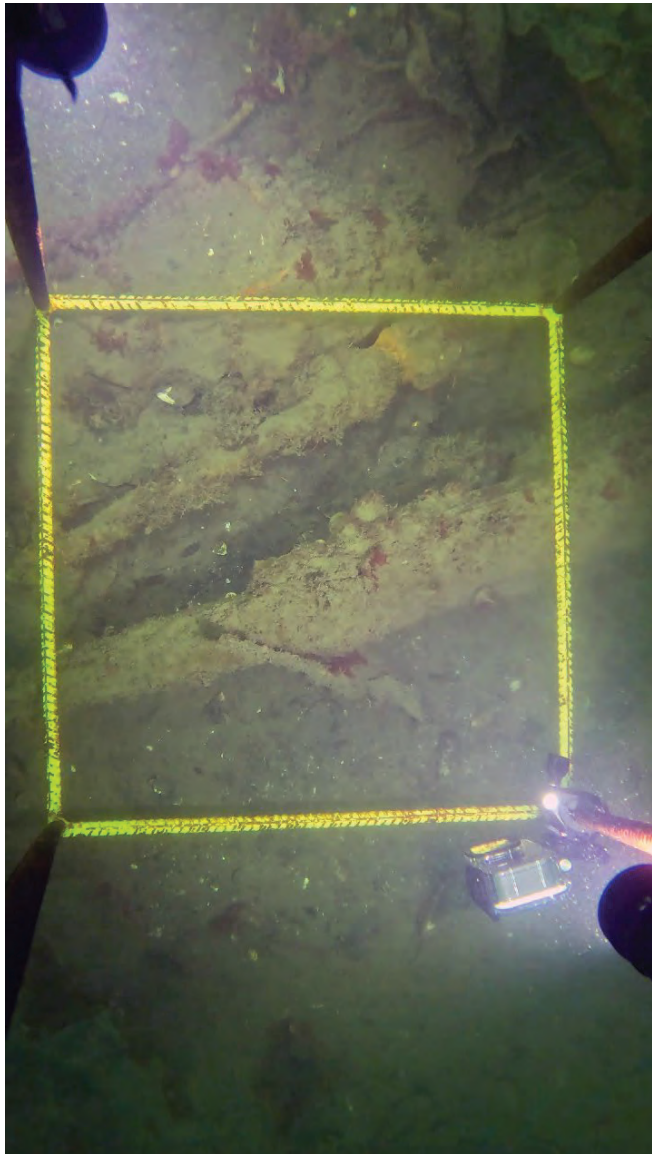
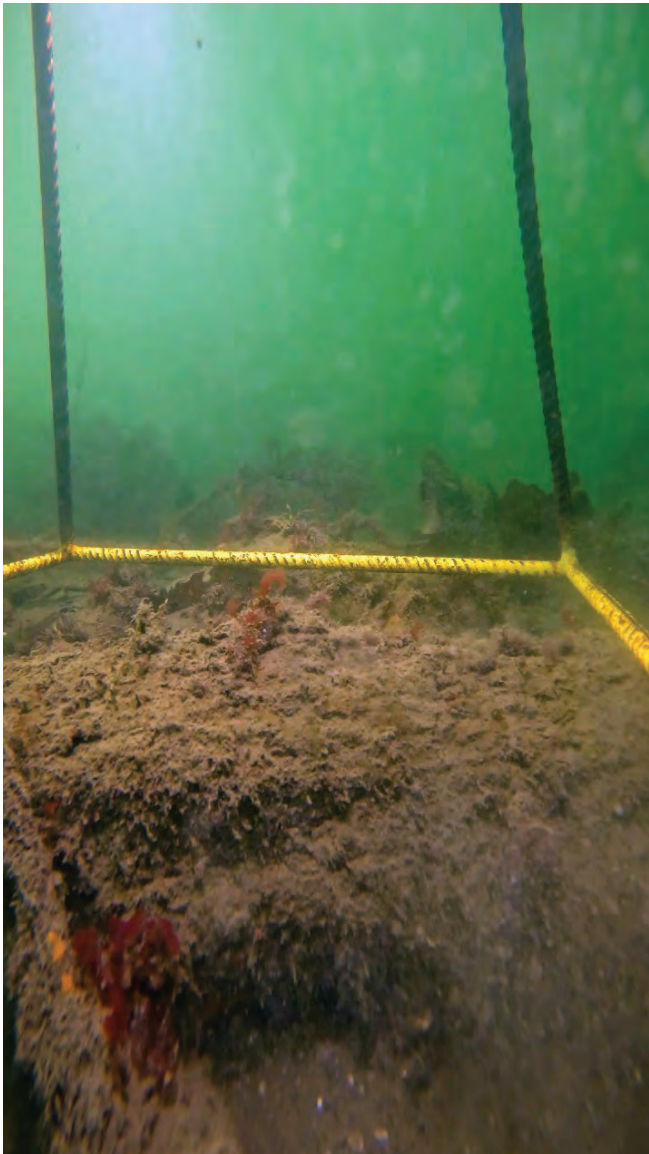
Notes:

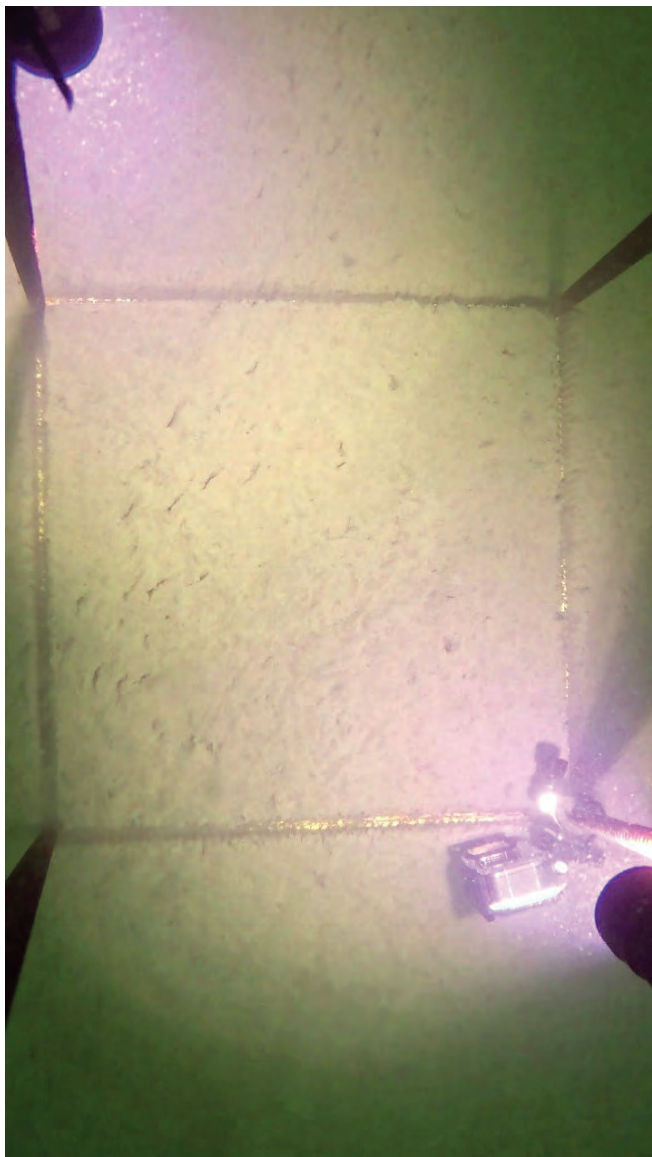
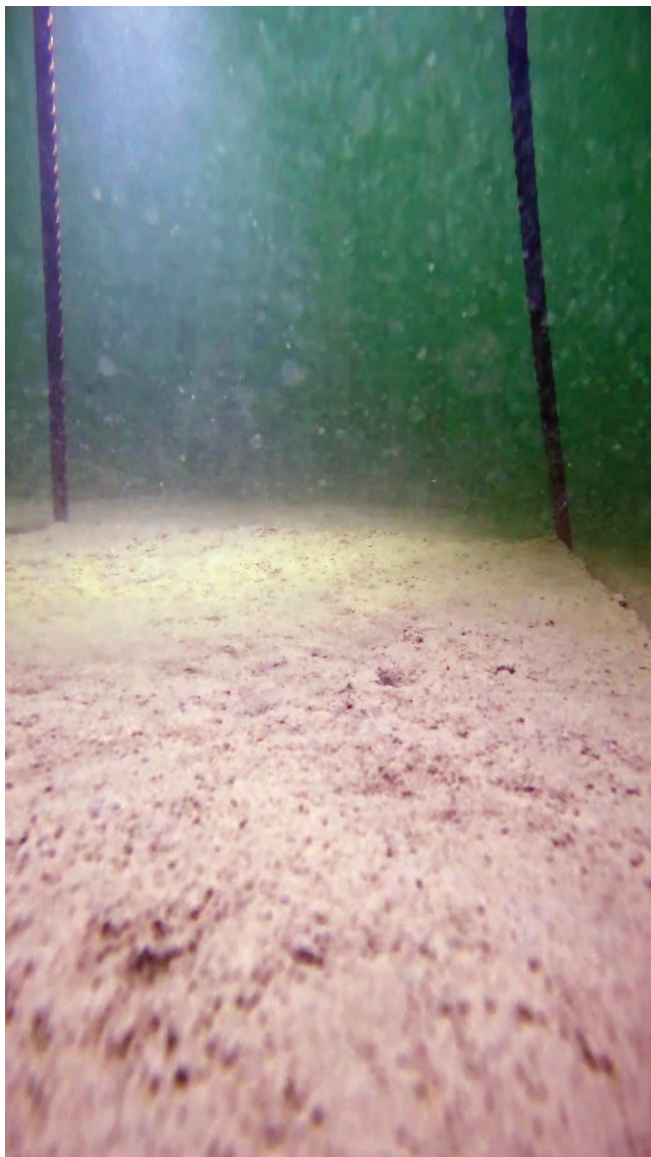
Silt with trace shell hash and a moderate cover of microbial algae. Spider crab (*Majoidea* sp.) present. Located at the mouth of the Fort Point Channel adjacent to the Federal Courthouse.

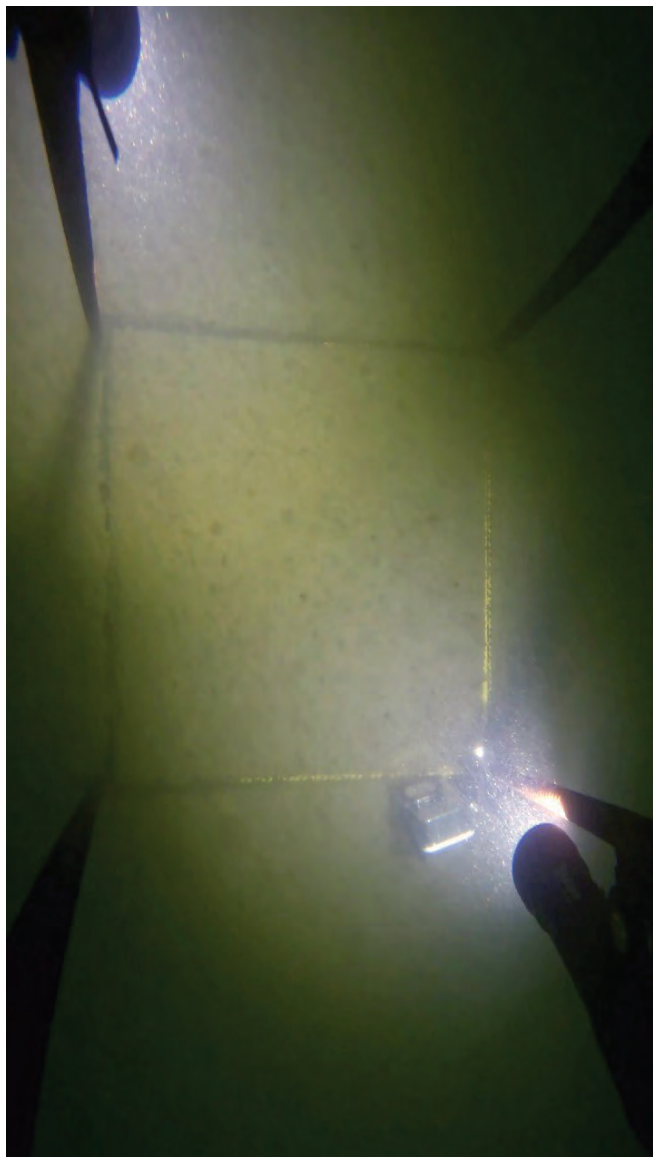
BOSTON HARBOR - DOWNTOWN WATERFRONT

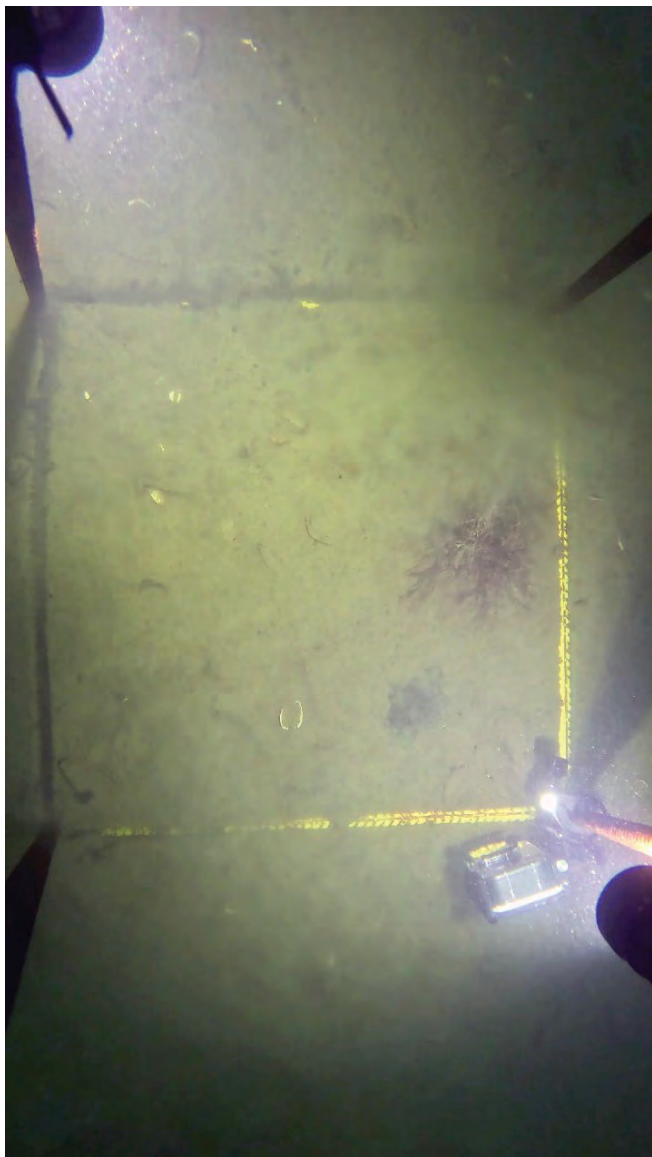


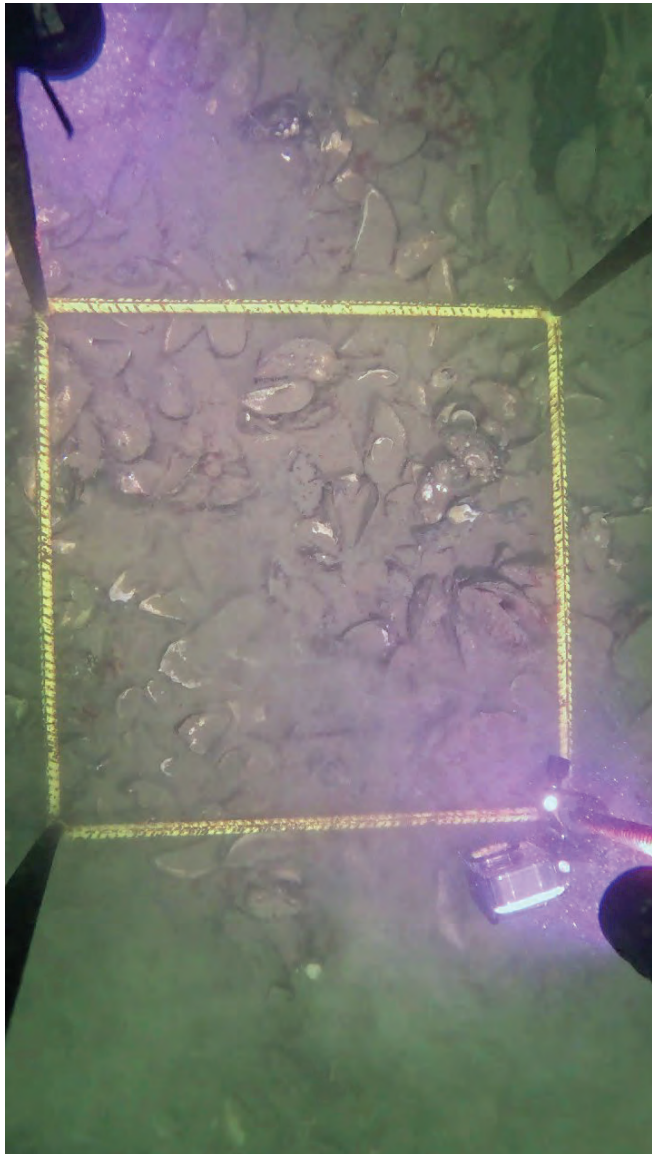
Survey Area:		Downtown Waterfront		Station:		DT-1	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.368000		Longitude (NAD83): -71.049995		Water Depth (FT):		-24.5	
Plan View				Profile View			
							
Notes:							
Bare silt with sparse small infaunal invertebrate tubes and burrows. Anthropogenic debris with attached tunicates and/or sponges (ind.) visible in plan- and profile-view images. Located between the USCG Pier and Battery Wharf.							

Survey Area:		Downtown Waterfront		Station:		DT-2	
Date: 10/26/2023		Vessel: R/V Nomad		Platform: 0.25m ² drop frame - plan and profile cameras			
Latitude (NAD83): 42.367528		Longitude (NAD83): -71.049639		Water Depth (FT):		-15.7	
Plan View				Profile View			
							
Notes:							
Large submerged anthropogenic debris (likely historic/derelict wooden wharf structures) with mixed macroalgae, encrusting sponges (likely <i>Halichondria panicea</i>), ectoprocts (<i>Bugula</i> sp.), hydroids, and tunicates attached. Located in front of Battery Wharf.							

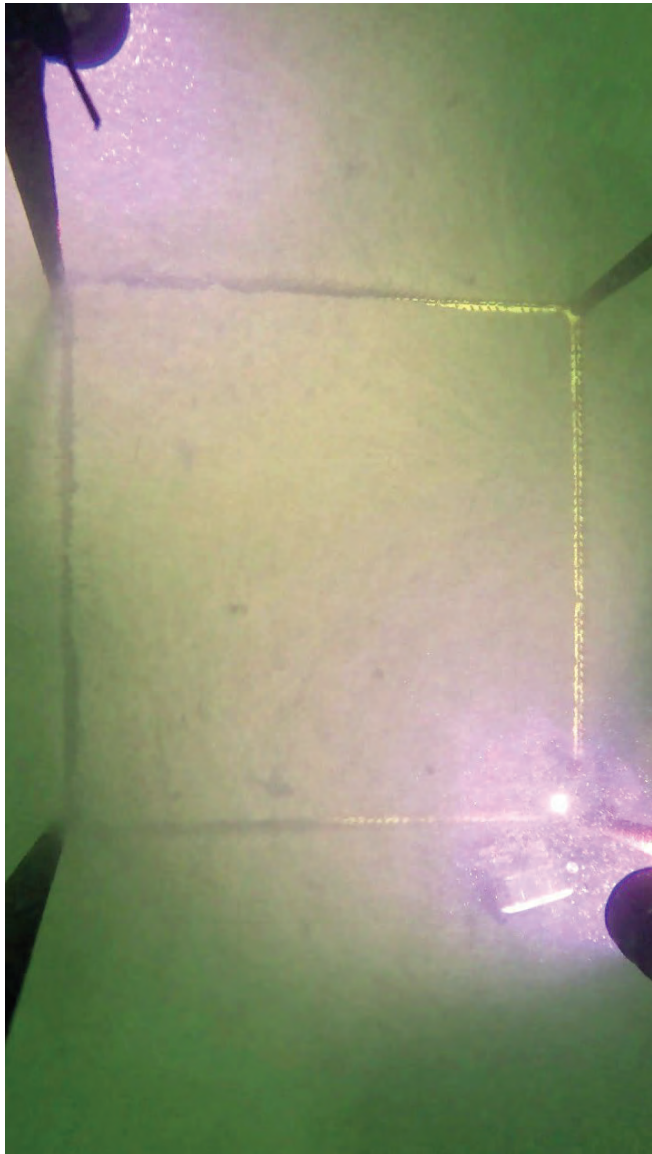
Survey Area:		Downtown Waterfront		Station:		DT-3	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.367427		Longitude (NAD83): -71.049119		Water Depth (FT):		-29.9	
Plan View				Profile View			
							
Notes:							
Bare silt with small infaunal invertebrate tubes and burrows. Located adjacent to Battery Wharf.							

Survey Area:		Downtown Waterfront		Station:		DT-4					
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.367236		Longitude (NAD83):		-71.048532		Water Depth (FT):		-35.7	
Plan View						Profile View					
						No image available					
Notes:											
Bare silt with small infaunal invertebrate burrows. Located approximately 50 feet north of Sumner Tunnel.											

Survey Area:		Downtown Waterfront		Station:		DT-5	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.366906		Longitude (NAD83): -71.049756		Water Depth (FT):		-14.3	
Plan View				Profile View			
							
Notes:							
Silt with sparse shell rubble. Evidence of bioturbation (small burrow with unearthed unoxidized sediment) present. Small tuft of red filamentous macroalgae present. Located between Battery and Burroughs Wharves.							

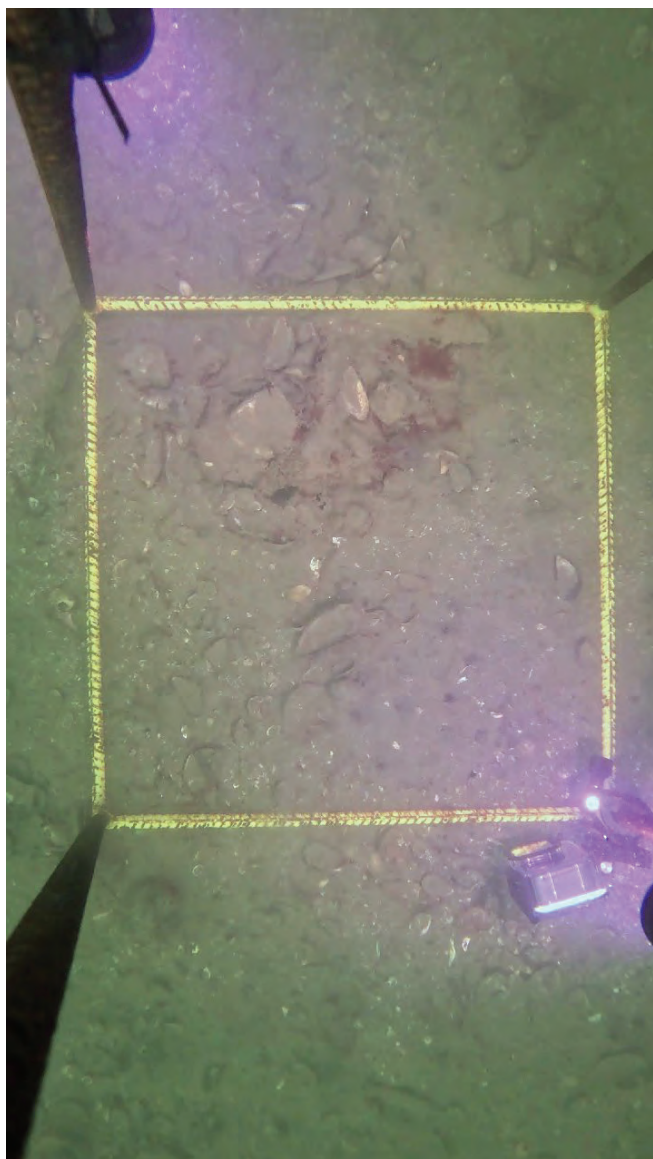
Survey Area:		Downtown Waterfront		Station:		DT-6	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.366223		Longitude (NAD83): -71.048948		Water Depth (FT):		-18.6	
Plan View				Profile View			
							
Notes:							
Silt and mussel shell rubble with attached hydroids and trace red sheet macroalgae. Located adjacent to Burroughs Wharf and the Callahan Tunnel.							

Survey Area:		Downtown Waterfront		Station:		DT-7	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.365740		Longitude (NAD83): -71.049302		Water Depth (FT):		-20.9	
Plan View				Profile View			
							
Notes:							
Bare silt; epifaunal invertebrate tracks visible on sediment surface. Located between Burroughs and Union Wharves.							

Survey Area:		Downtown Waterfront		Station:		DT-8	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.365583		Longitude (NAD83): -71.048465		Water Depth (FT):		-26.0	
Plan View				Profile View			
							
Notes:							
Bare silt with sparse small infaunal invertebrate burrows. Located near Union Wharf.							

Survey Area: <i>Downtown Waterfront</i>		Station: <i>DT-9</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Latitude (NAD83): <i>42.364899</i>	Longitude (NAD83): <i>-71.048677</i>	Water Depth (FT): <i>-15.8</i>	

Plan View

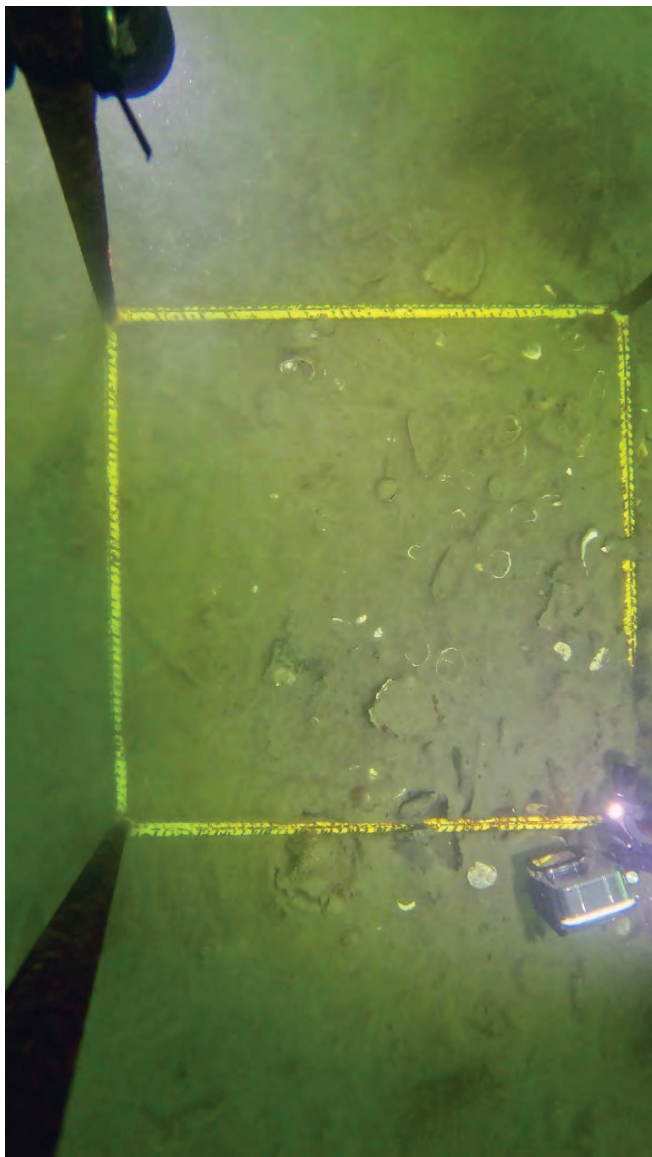
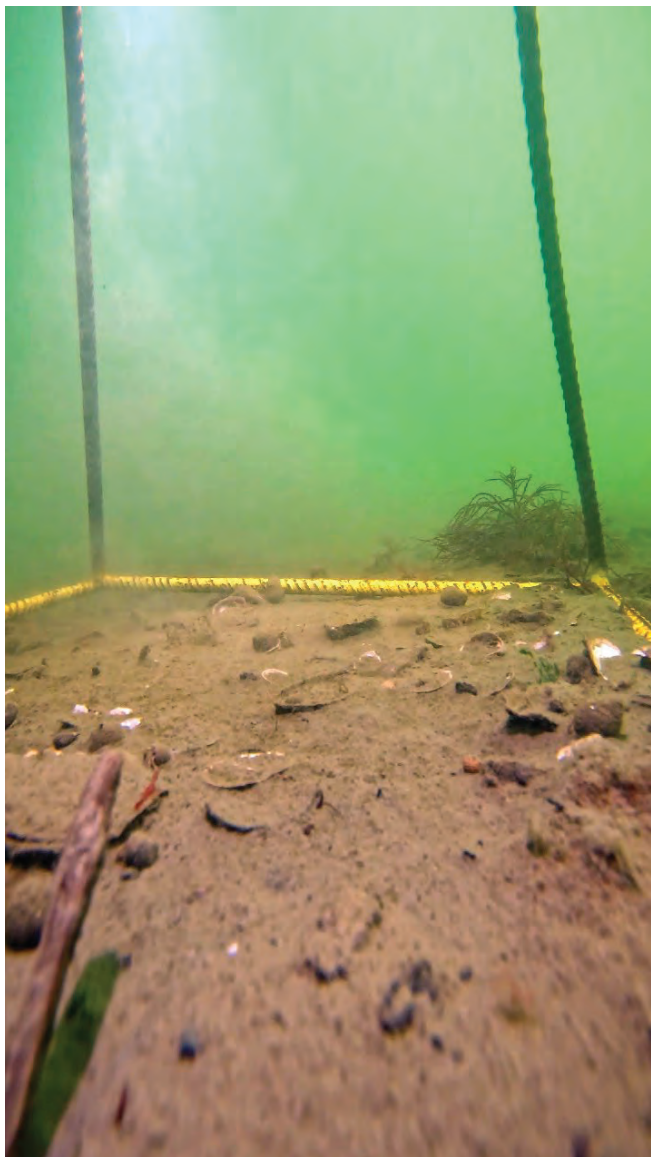


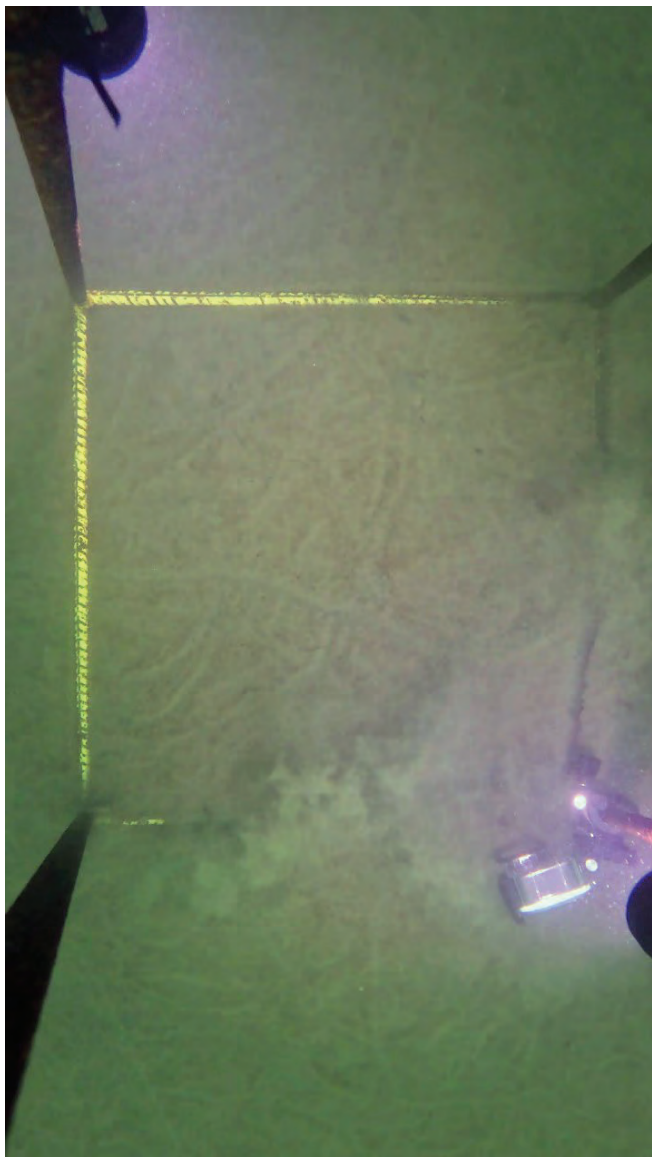
Profile View

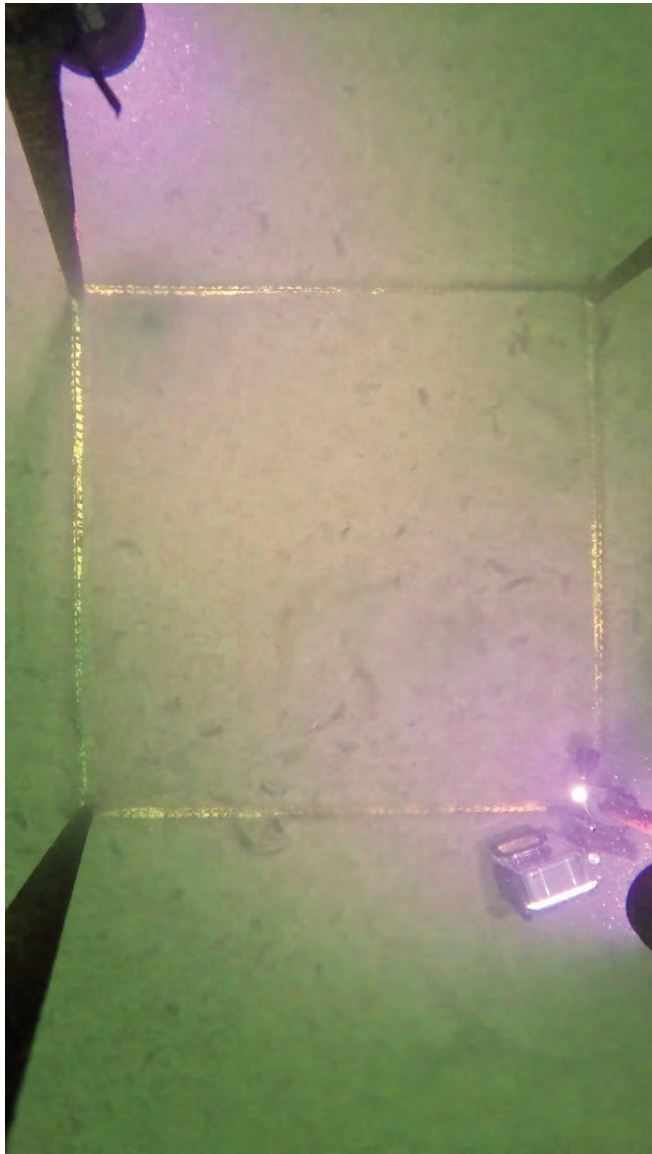


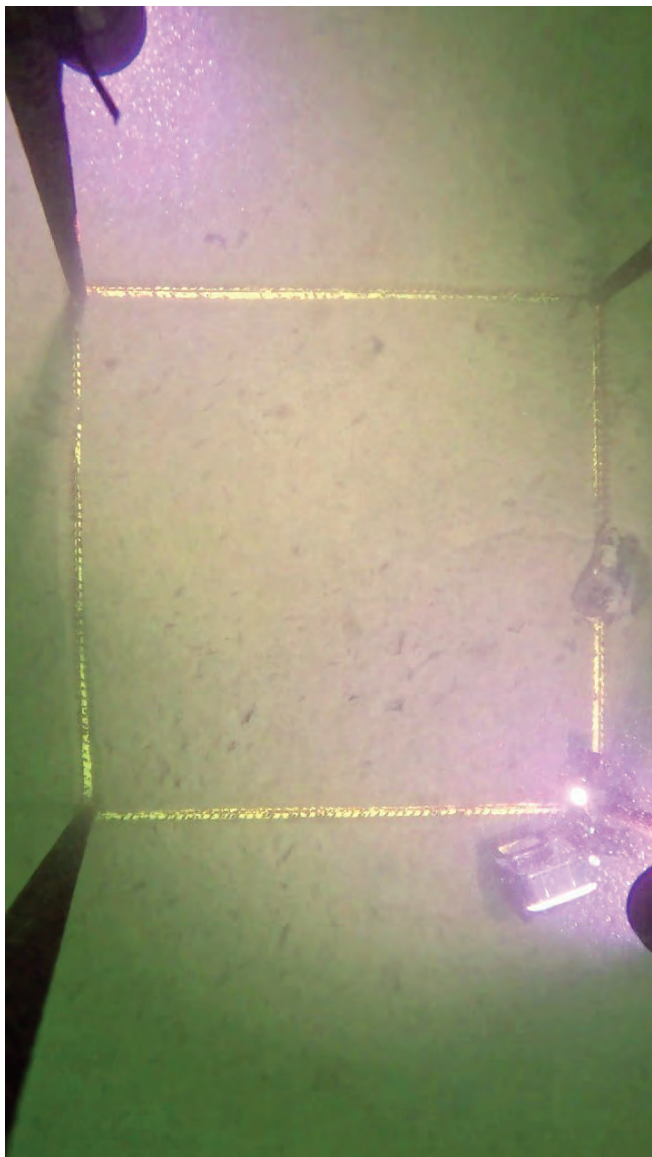
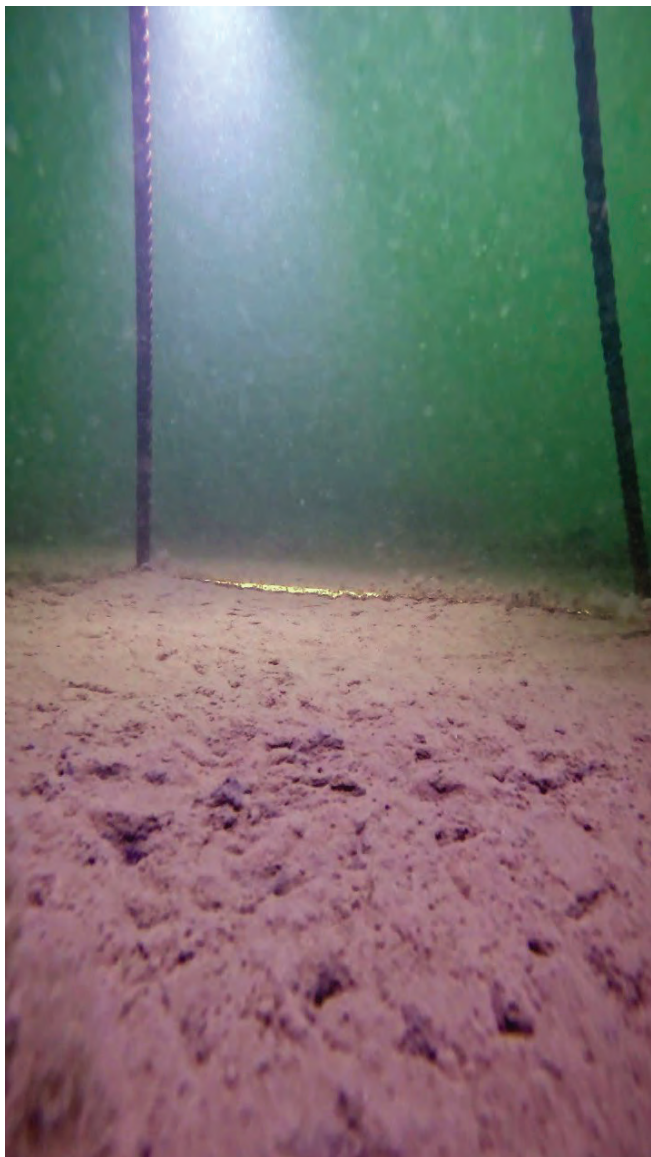
Notes:

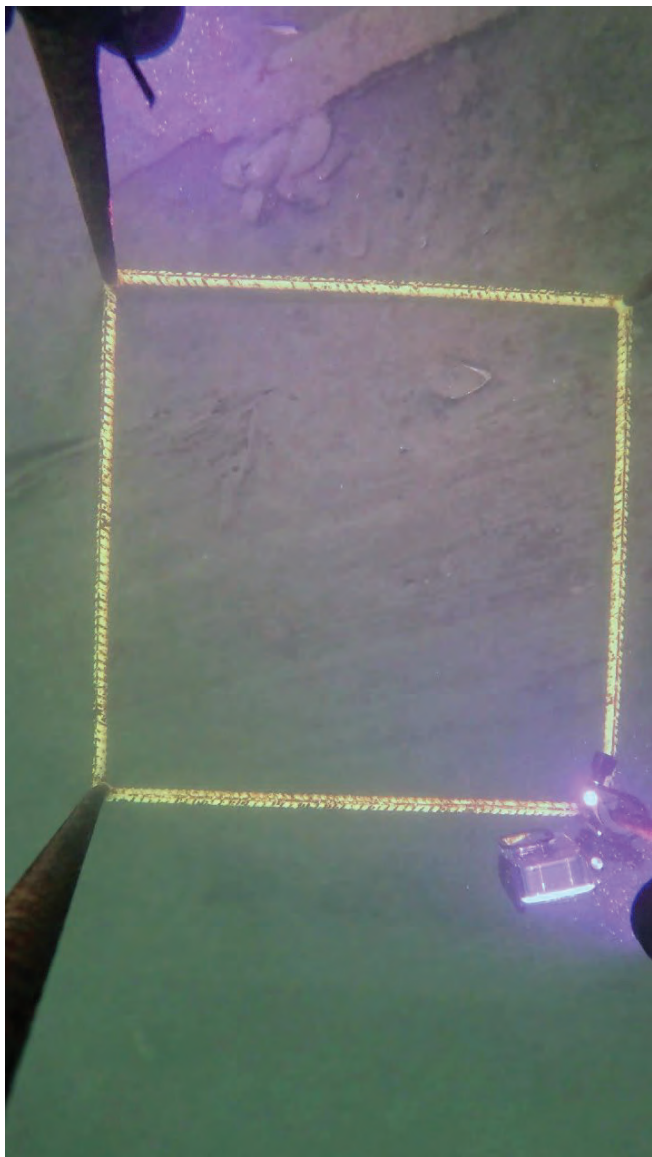
Silty sand with gravel and shell hash/rubble. Sparse cover of red sheet macroalgae. Infaunal invertebrate castings visible on sediment surface. Possibly ectoprocts and/or hydroids attached to hard substratum. Located adjacent to Union Wharf.

Survey Area:		Downtown Waterfront		Station:		DT-10	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.364643		Longitude (NAD83): -71.049379		Water Depth (FT):		-12.9	
Plan View				Profile View			
							
Notes:							
Silt with moderate shell debris and gravel. Trace woody debris present. Filamentous macroalgae visible in profile-view image. Located adjacent to Sargent's Wharf.							

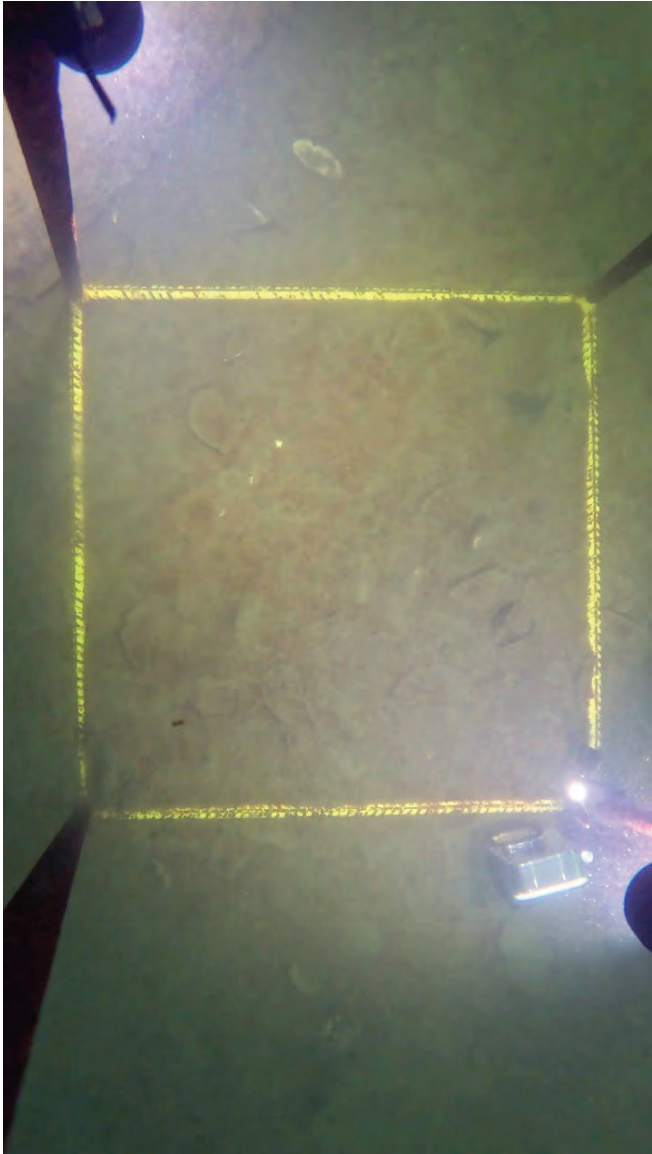
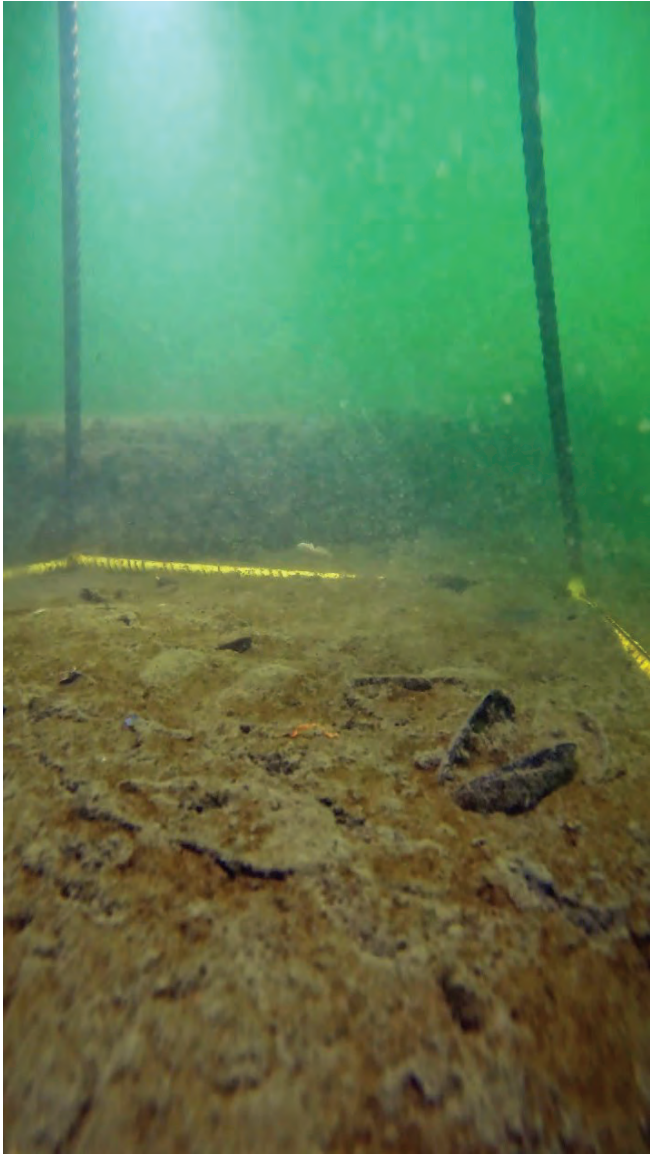
Survey Area:		Downtown Waterfront		Station:		DT-11					
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.364074		Longitude (NAD83):		-71.048658		Water Depth (FT):		-17.5	
Plan View						Profile View					
											
Notes:											
Bare silt; epifaunal invertebrate tracks visible on sediment surface. Located near Sargent's Wharf.											

Survey Area:		Downtown Waterfront		Station:		DT-12	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.363813		Longitude (NAD83): -71.048368		Water Depth (FT):		-21.2	
Plan View				Profile View			
							
Notes:							
Bare silt with infaunal invertebrate burrows and epifaunal invertebrate tracks. Located near Sargent's Wharf.							

Survey Area:		Downtown Waterfront		Station:		DT-13	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.363819		Longitude (NAD83): -71.047729		Water Depth (FT):		-26.9	
Plan View				Profile View			
							
Notes:							
Bare silt with infaunal invertebrate burrows. Anthropogenic debris visible in plan-view image. Located near Sargent's Wharf.							

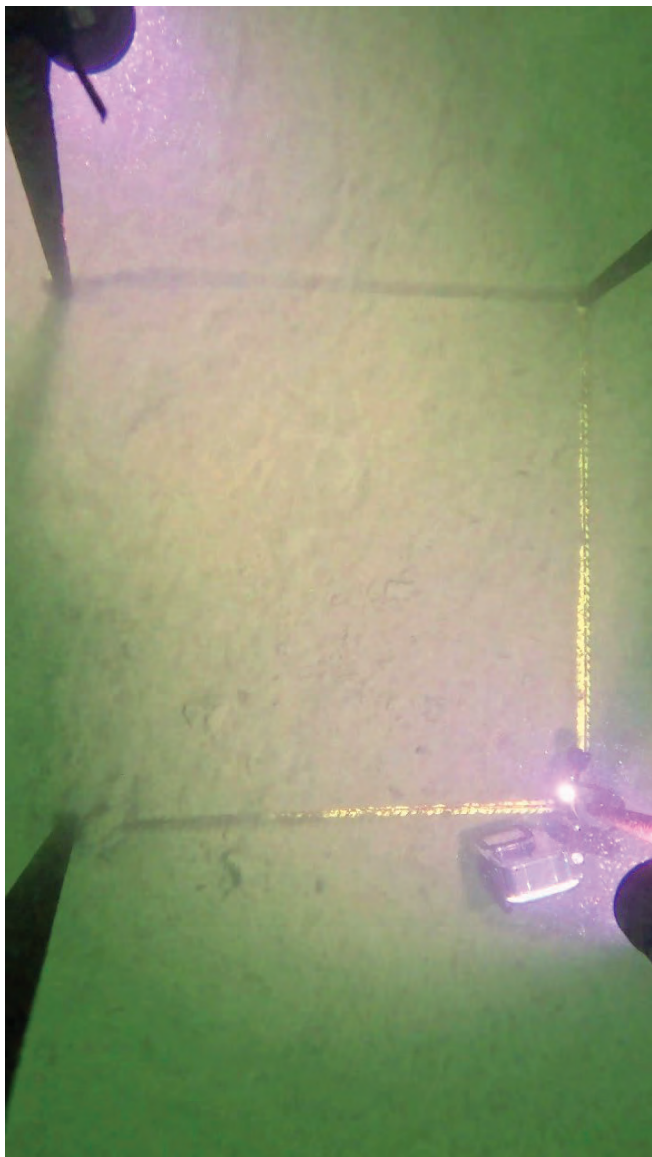
Survey Area:		Downtown Waterfront		Station:		DT-14	
Date:	10/26/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Latitude (NAD83):		42.362851	Longitude (NAD83):		-71.048186	Water Depth (FT):	-17.4
Plan View				Profile View			
							
Notes:							
Large anthropogenic wooden debris. Upright wooden piling and wooden support legs visible in profile-view image. Patch of mussels (Mytilidae sp.) attached to the wood substrate. Located in the footprint of a historic wharf (currently a derelict piling field) near Lewis Wharf.							

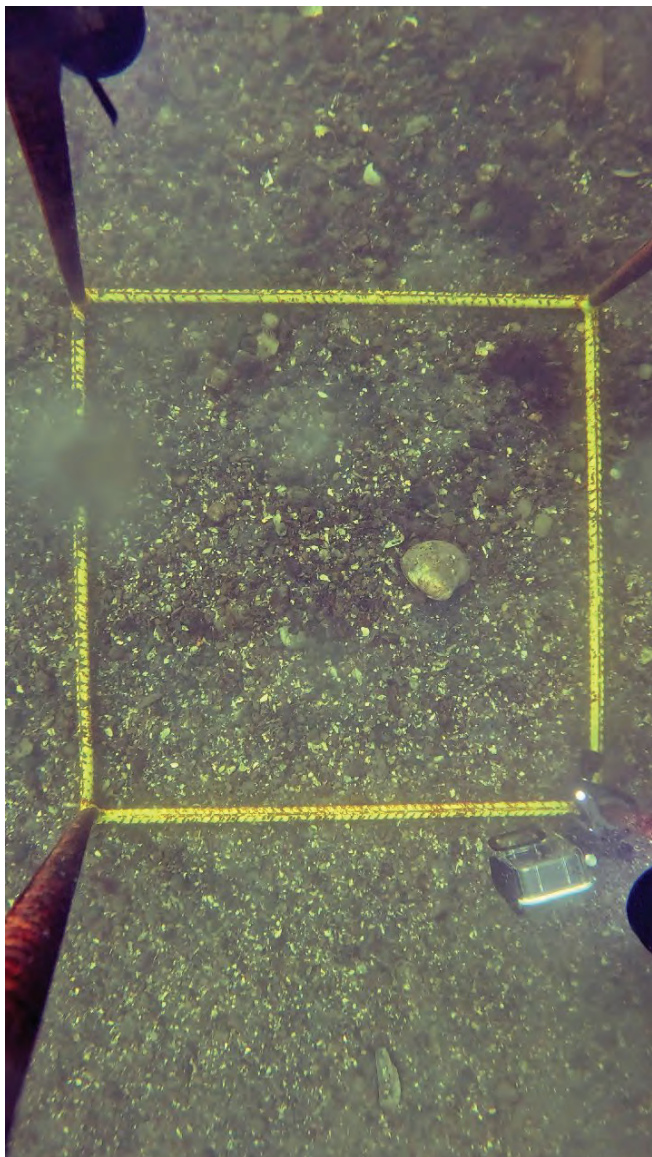
Survey Area: <i>Downtown Waterfront</i>		Station: <i>DT-15</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Latitude (NAD83): <i>42.362210</i>	Longitude (NAD83): <i>-71.049069</i>	Water Depth (FT): <i>-16.3</i>	

Plan View	Profile View
	

Notes:

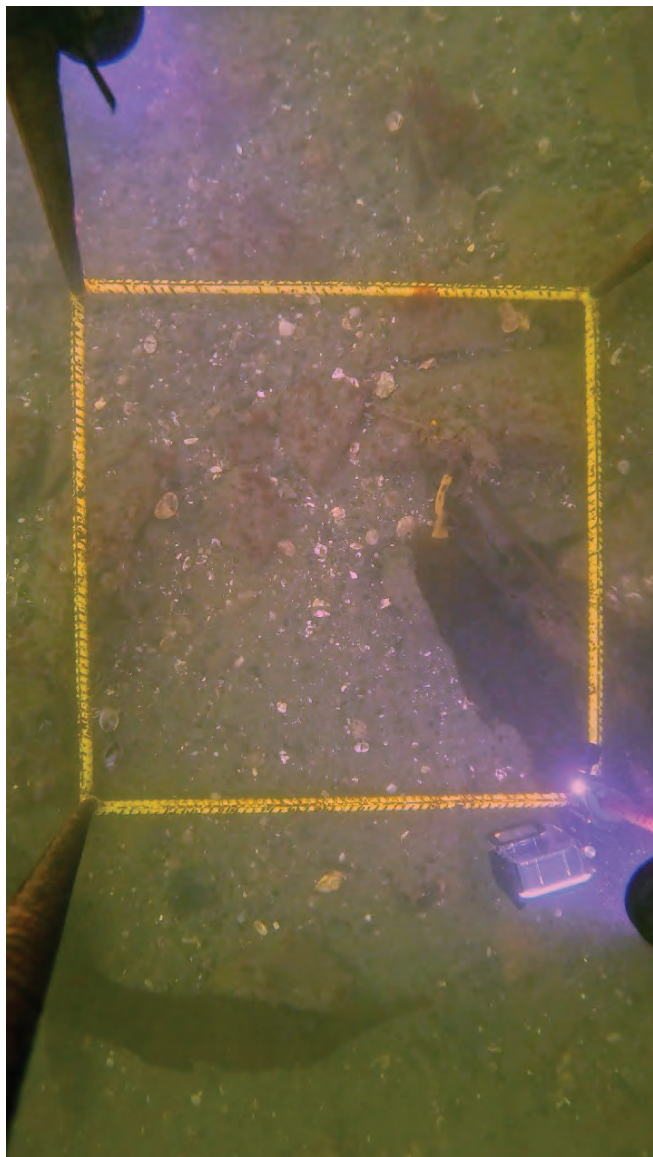
Silt and shell rubble with thin microbial algal mat growing on sediment surface. Rectangular anthropogenic structure (possibly a dock mooring block) visible in plan- and profile-view images. Located between Lewis and Commercial Wharves.

Survey Area:		Downtown Waterfront		Station:		DT-16	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.361686		Longitude (NAD83): -71.046712		Water Depth (FT):		-25.4	
Plan View				Profile View			
							
Notes:							
Bare silt; small infaunal invertebrate tubes and burrows present. Located near Commercial Wharf.							

Survey Area:		Downtown Waterfront		Station:		DT-17	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.361194		Longitude (NAD83): -71.050621		Water Depth (FT):		-4.3	
Plan View				Profile View			
							
Notes:							
Gravel with shell hash/rubble. Located between Commercial and Long Wharves, adjacent to Christopher Columbus Waterfront Park.							

Survey Area: <i>Downtown Waterfront</i>		Station: <i>DT-18</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Latitude (NAD83): <i>42.361147</i>	Longitude (NAD83): <i>-71.048579</i>	Water Depth (FT): <i>-17.6</i>	

Plan View



Profile View

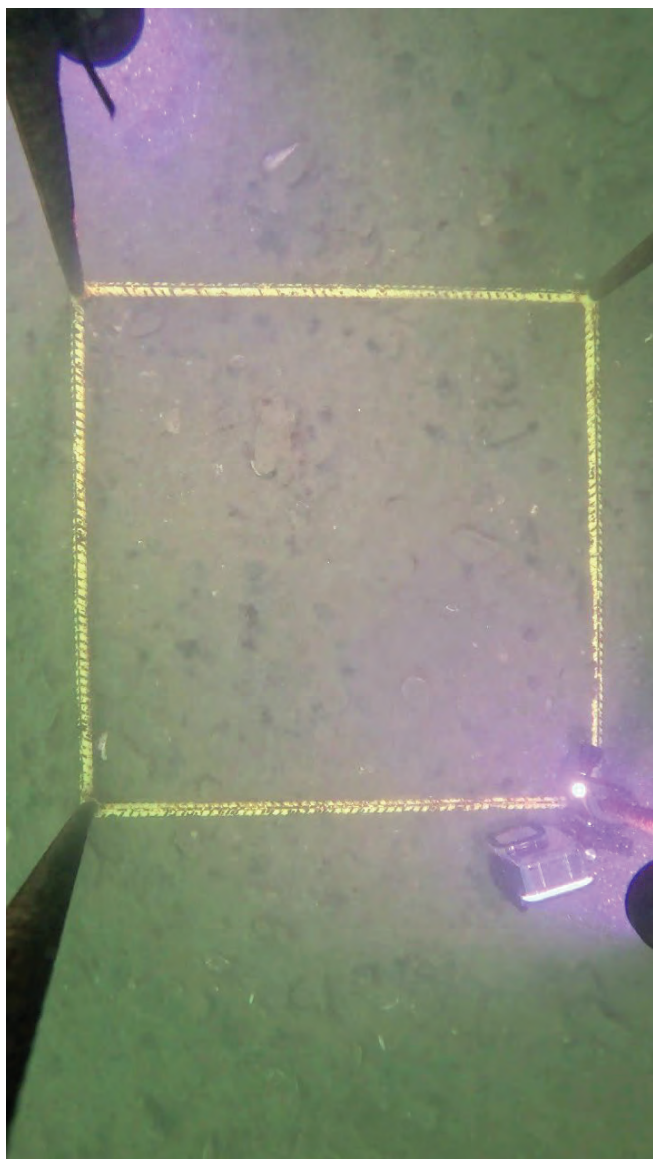


Notes:

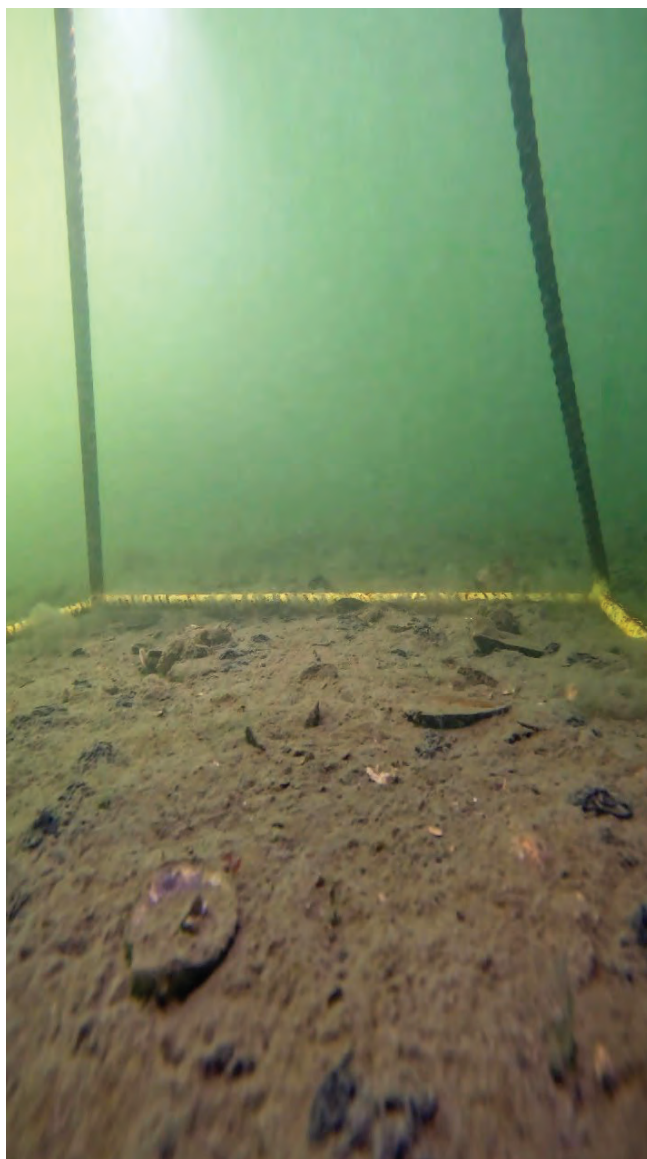
*Gravelly/ shelly sand with interspersed cobbles. Sparse cover of mixed macroalgae, including kelp (likely *Saccharina* sp.) attached to hard substratum. Encrusting sponge (likely *Halichondria panicea*) visible growing on the kelp stipe. Located between Commercial and Long Wharves.*

Survey Area: <i>Downtown Waterfront</i>			Station: <i>DT-19</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.360506</i>	Longitude (NAD83): <i>-71.047549</i>		Water Depth (FT): <i>-21.0</i>	

Plan View

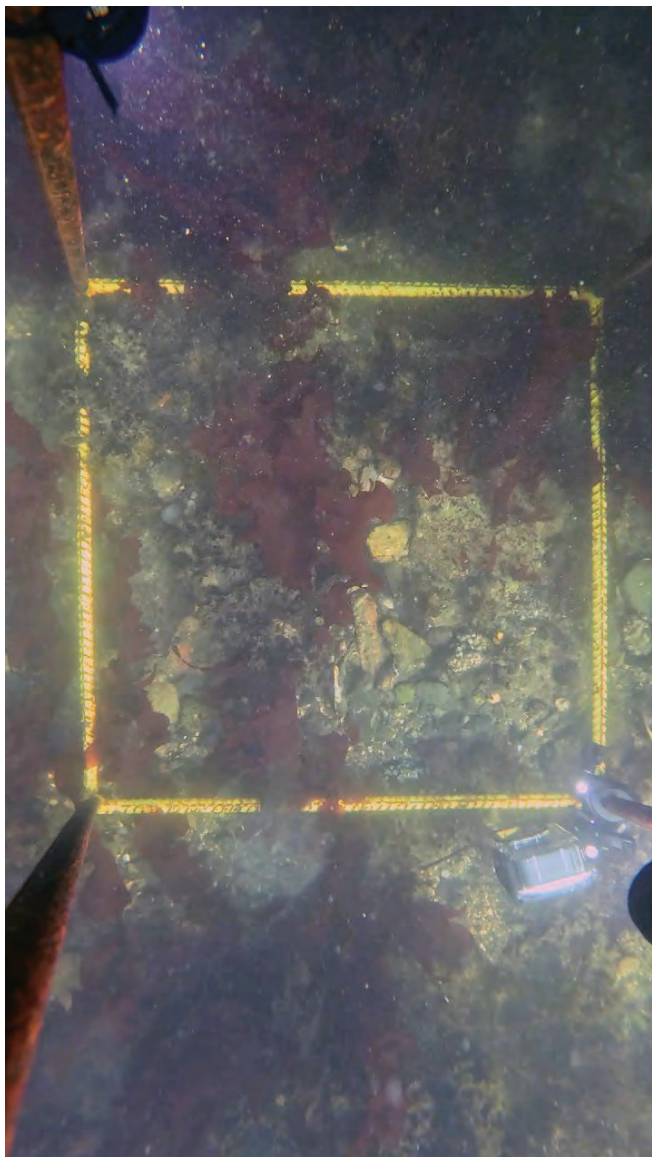


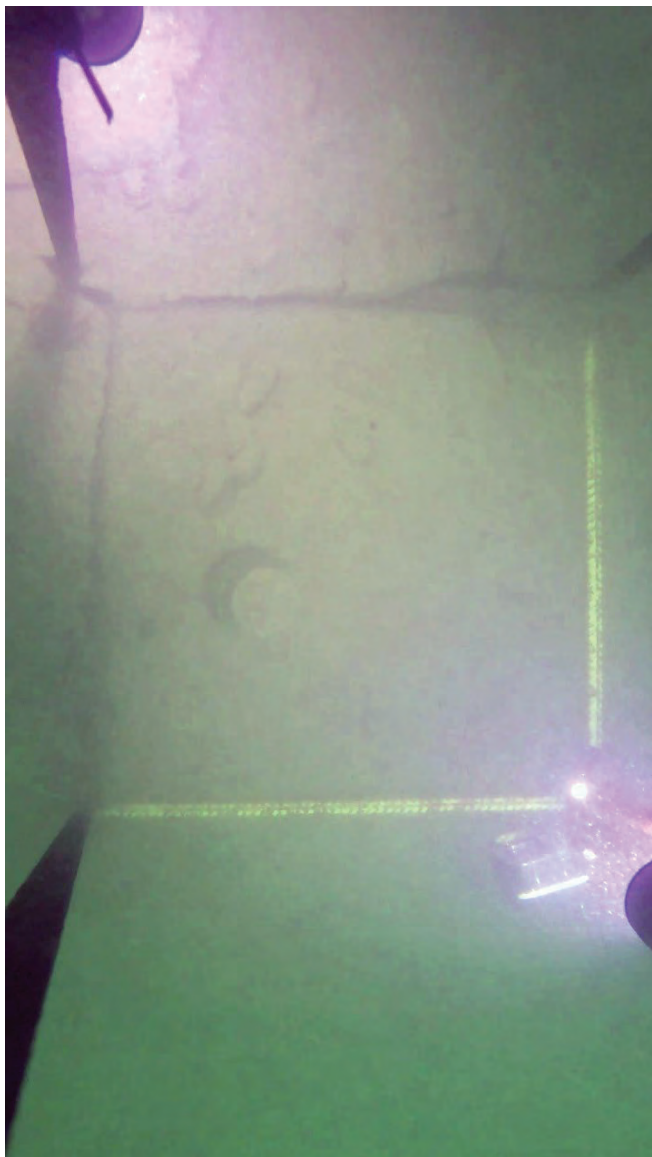
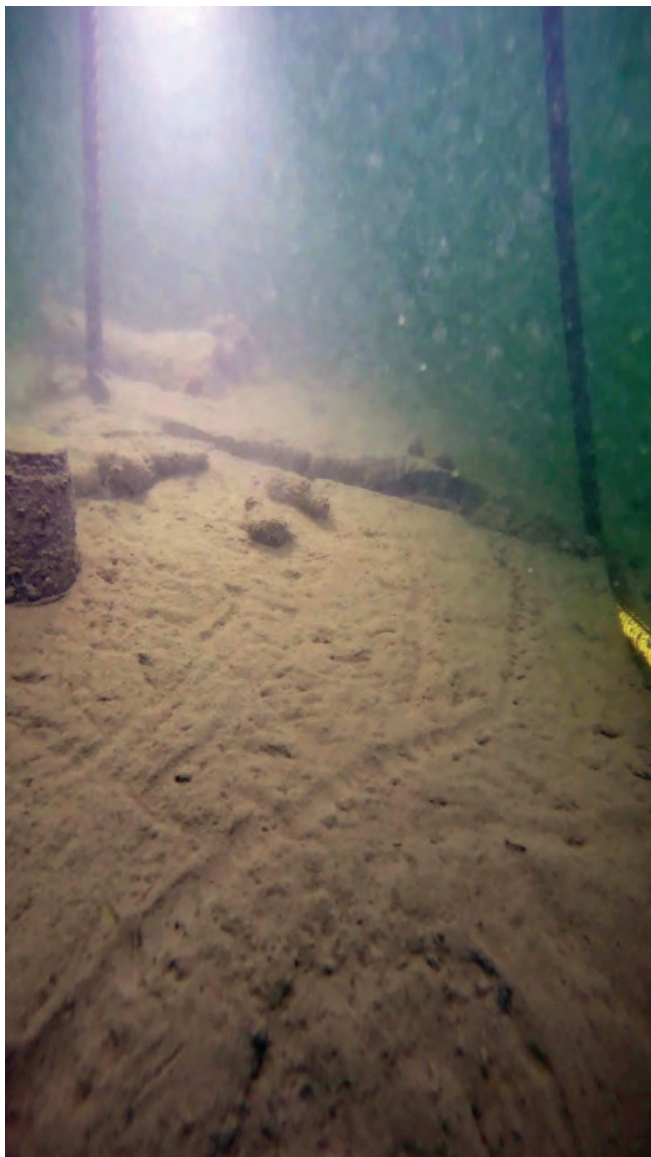
Profile View

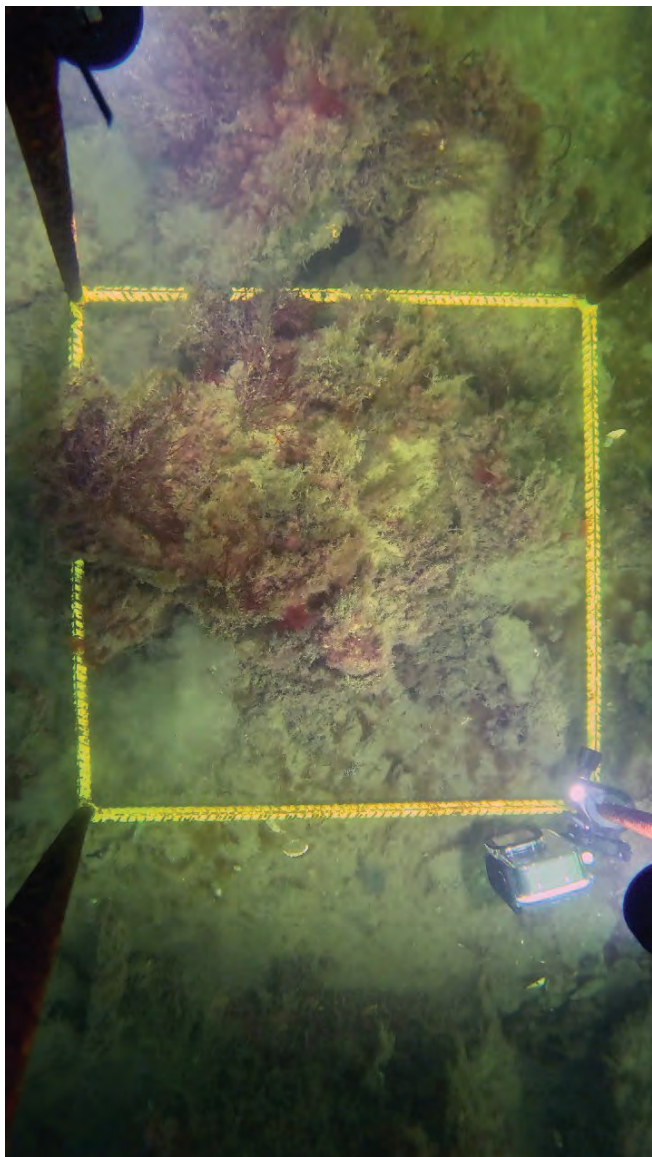
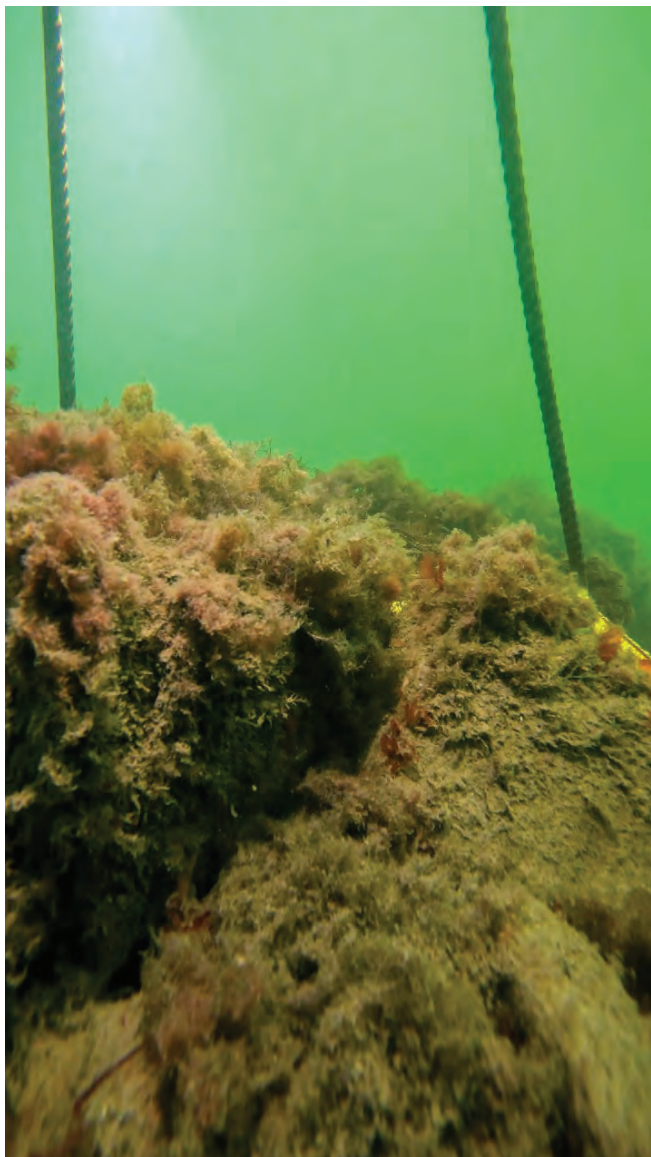


Notes:

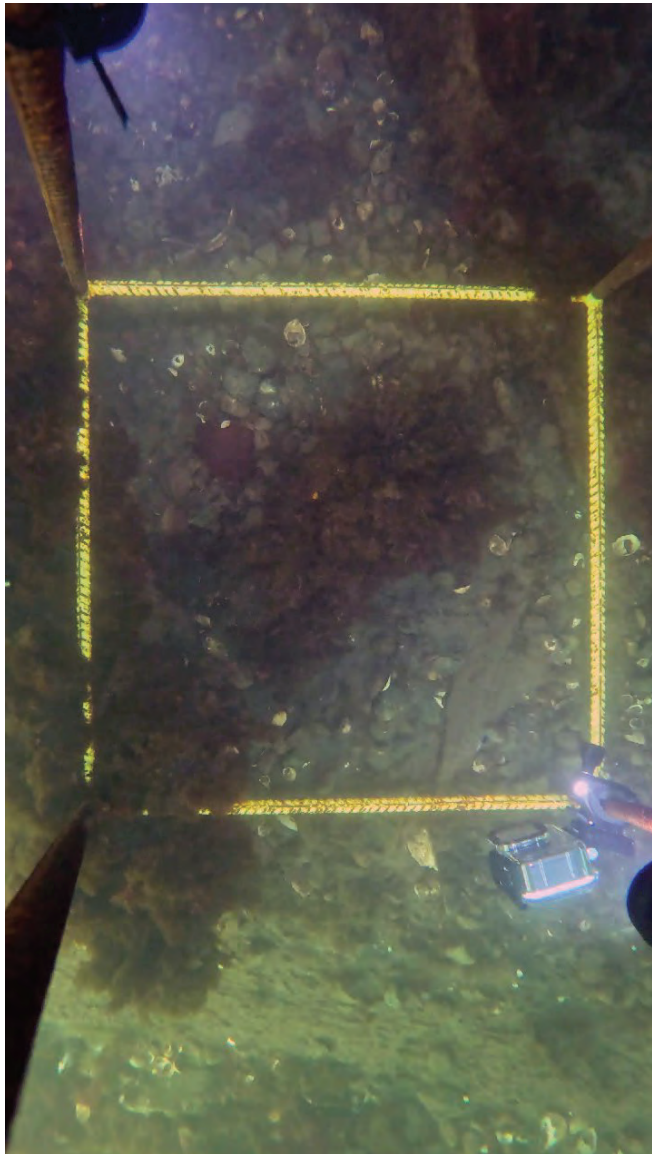
Shelly silt with many infaunal invertebrate castings visible on sediment surface. Located adjacent to Long Wharf and the MBTA Blue Line Tunnel.

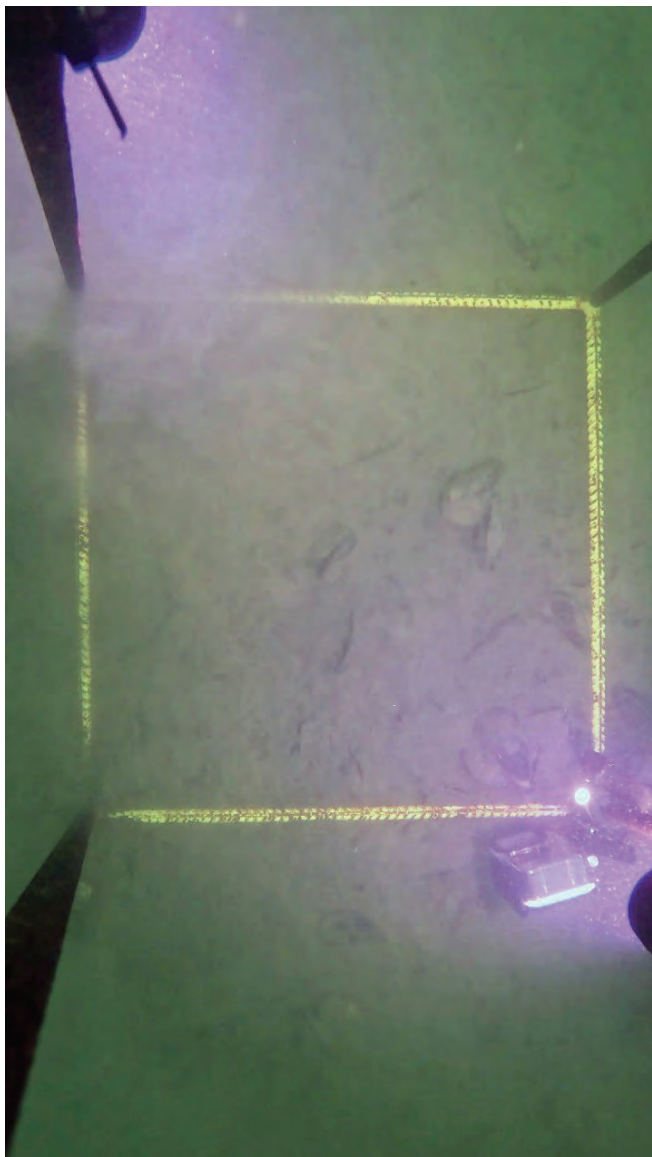
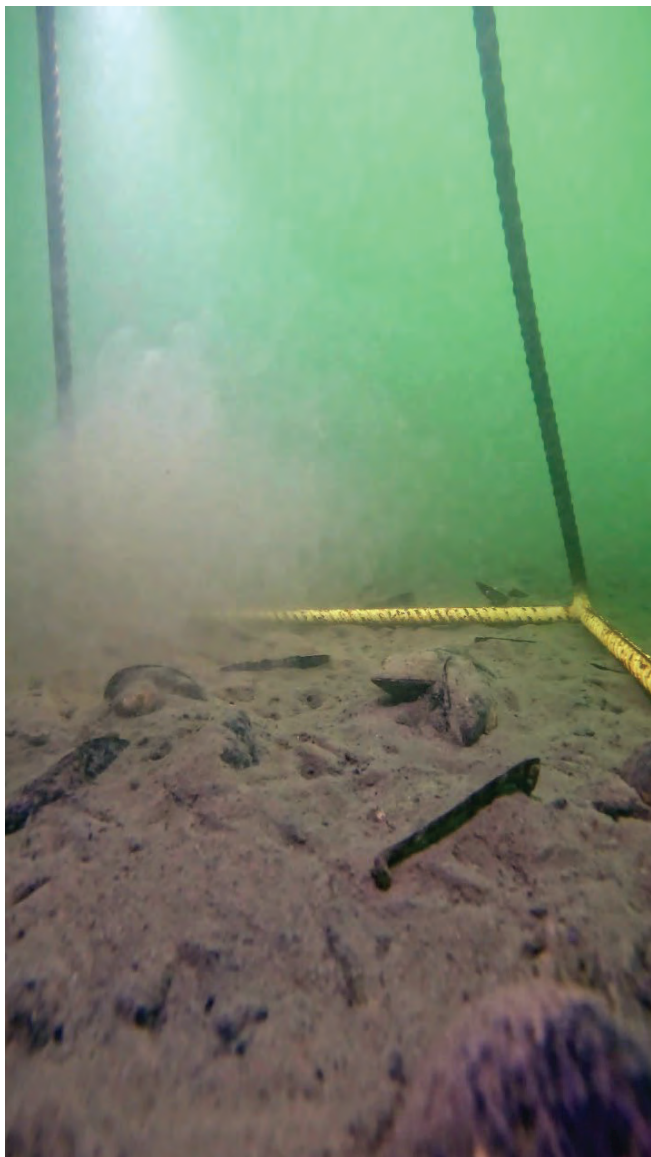
Survey Area:		Downtown Waterfront		Station:		DT-20					
Date:		10/26/2023		Vessel:		R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83):		42.359485		Longitude (NAD83):		-71.048368		Water Depth (FT):		-3.9	
Plan View						Profile View					
											
Notes:											
Gravel and cobbles with moderate to dense cover of mixed macroalgae. Located adjacent to Central Wharf in front of the Boston Aquarium.											

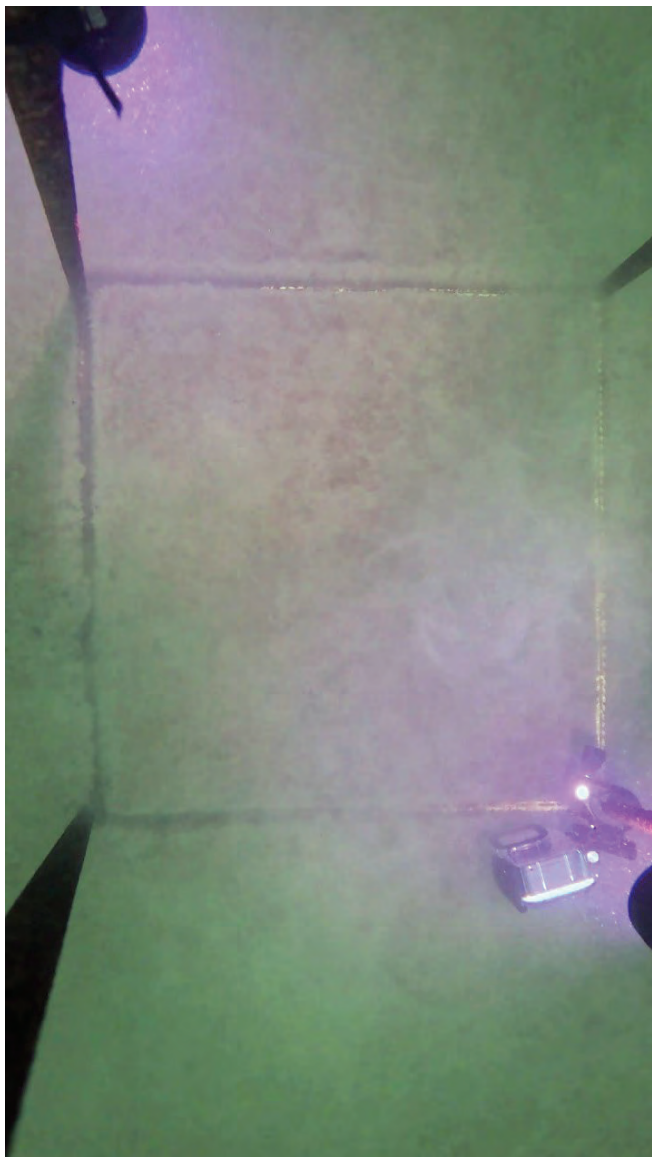
Survey Area:		<i>Downtown Waterfront</i>		Station:		<i>DT-21</i>	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.358700		Longitude (NAD83): -71.048874		Water Depth (FT):		-27.5	
Plan View				Profile View			
							
Notes:							
<i>Bare silt with anthropogenic debris. Epifaunal invertebrate track present through the middle of the quadrat. Small infaunal invertebrate burrows present. Located between Central and India Wharves.</i>							

Survey Area:		Downtown Waterfront		Station:		DT-22	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.358498		Longitude (NAD83): -71.050122		Water Depth (FT):		-14.9	
Plan View				Profile View			
							
Notes:							
Large boulder pile with dense cover of mixed filamentous macroalgae and bushy ectoprocts (Bugula sp.). Located between Central and India Wharves, adjacent to the Harborwalk.							

Survey Area:		Downtown Waterfront		Station:		DT-23	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.358414		Longitude (NAD83): -71.047905		Water Depth (FT):		-29.1	
Plan View				Profile View			
							
Notes:							
Bare silt with infaunal invertebrate burrows and several tunicates (likely Molgulidae sp., Styaela clava, or Ascidiella aspersa). Located near Central and India Wharves.							

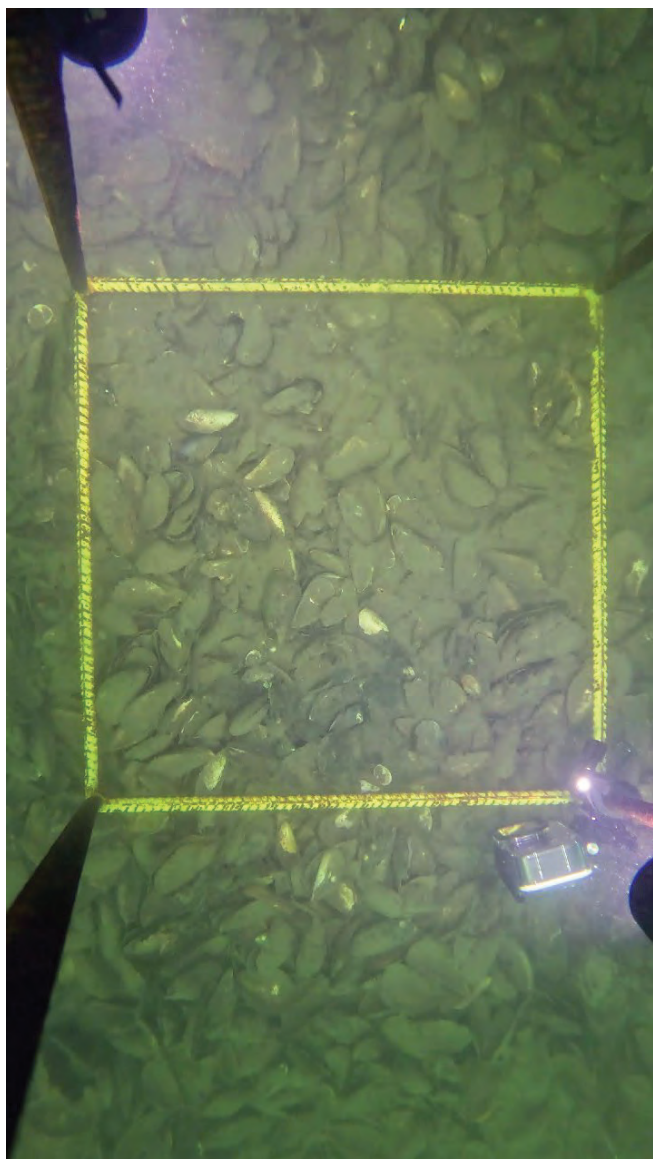
Survey Area:		Downtown Waterfront		Station:		DT-24	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.357978		Longitude (NAD83): -71.049074		Water Depth (FT):		-7.3	
Plan View				Profile View			
							
Notes:							
Gravel with shell hash/ rubble. Large anthropogenic structure (wood and metal) with attached mixed macroalgae present. Located adjacent to India Wharf in the footprint of a historic wharf structure.							

Survey Area:		Downtown Waterfront		Station:		DT-25	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.356866		Longitude (NAD83): -71.049060		Water Depth (FT):		-22.6	
Plan View				Profile View			
							
Notes:							
Silt with shell rubble. Located adjacent to Rowes Wharf.							

Survey Area:		Downtown Waterfront		Station:		DT-26	
Date: 10/26/2023		Vessel: R/V Nomad		Platform:		0.25m ² drop frame - plan and profile cameras	
Latitude (NAD83): 42.356579		Longitude (NAD83): -71.048537		Water Depth (FT):		-23.3	
Plan View				Profile View			
							
Notes:							
Bare silt. Located near Rowes Wharf.							

Survey Area: <i>Downtown Waterfront</i>		Station: <i>DT-27</i>	
Date: <i>10/26/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Latitude (NAD83): <i>42.355759</i>	Longitude (NAD83): <i>-71.049640</i>	Water Depth (FT): <i>-19.4</i>	

Plan View



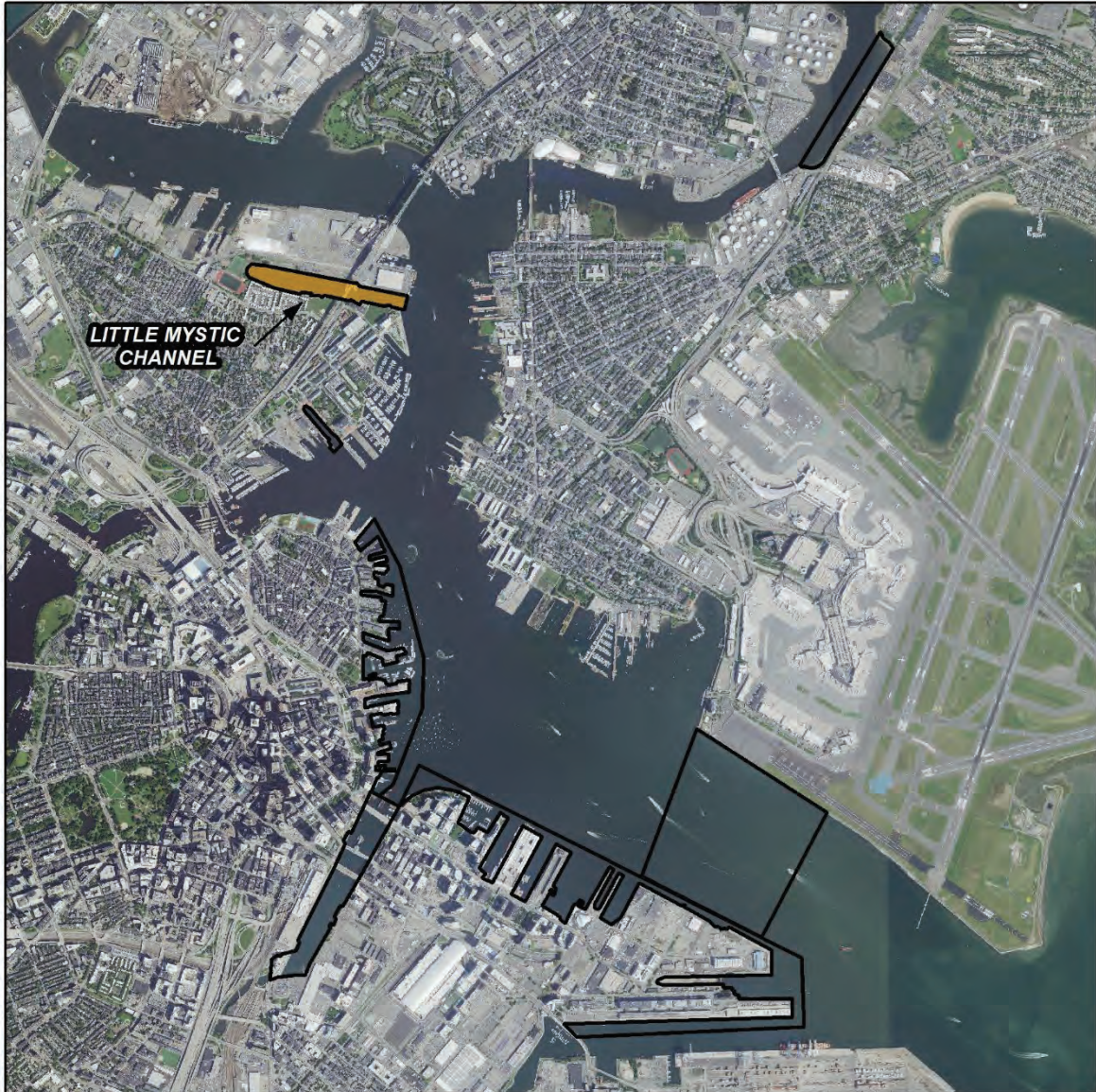
Profile View

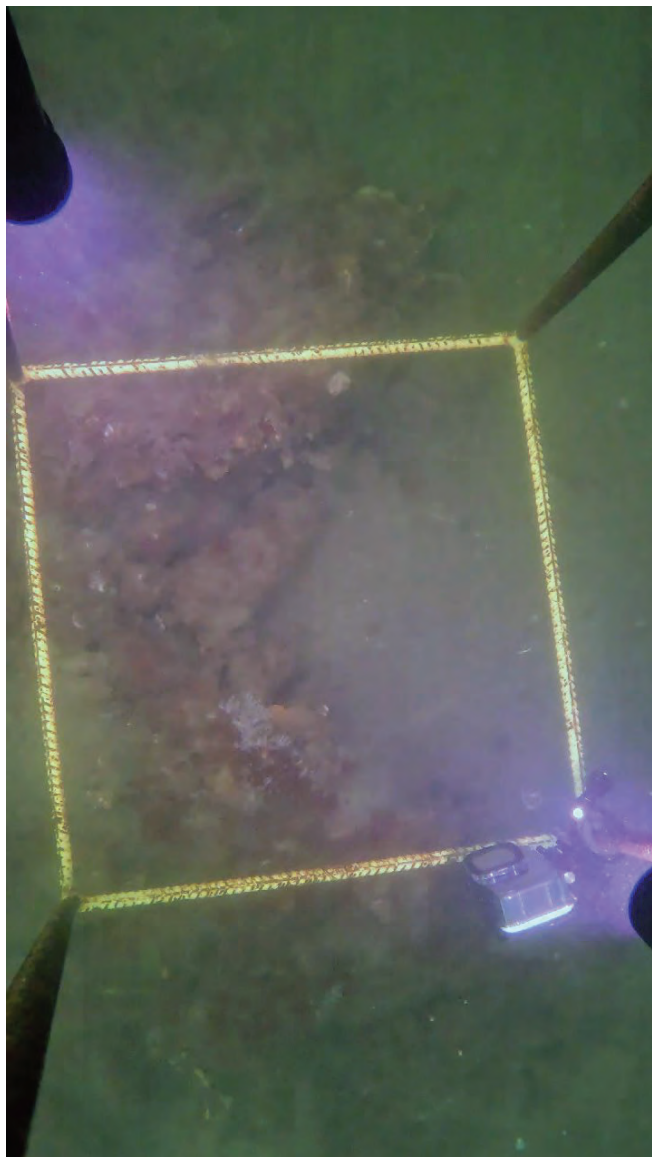


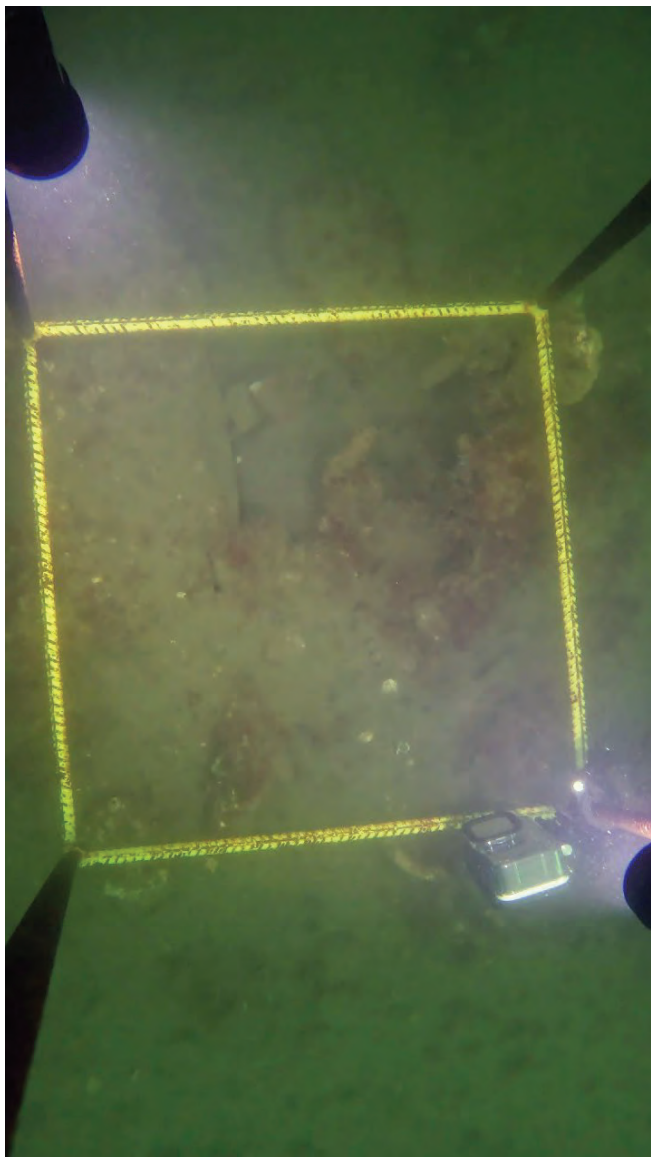
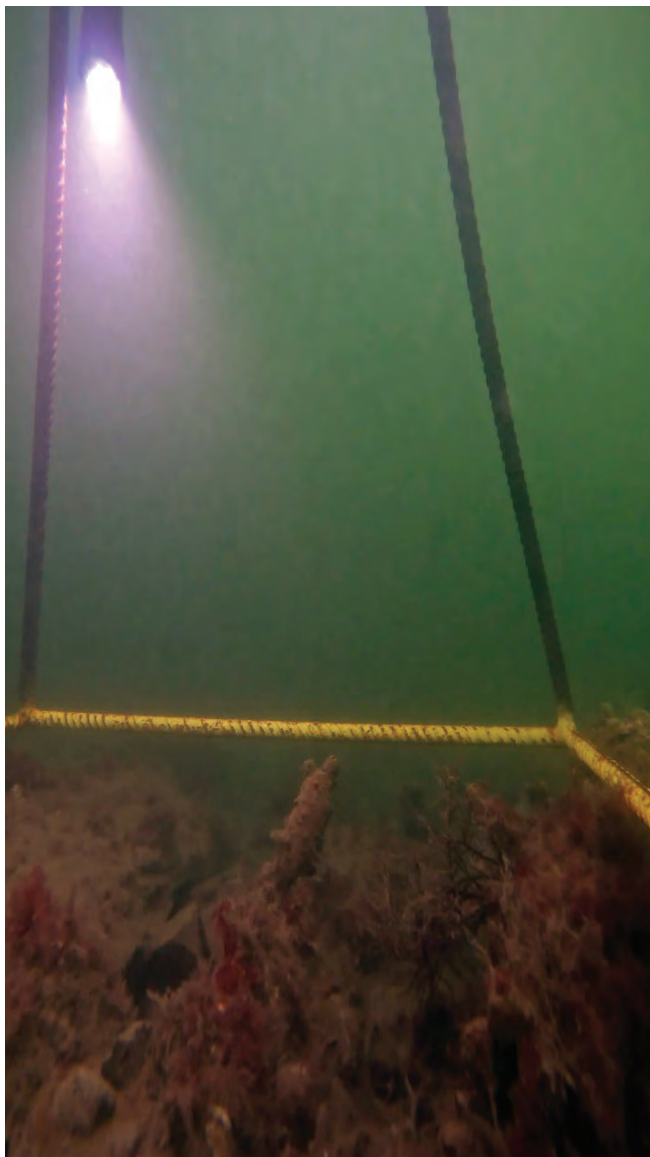
Notes:

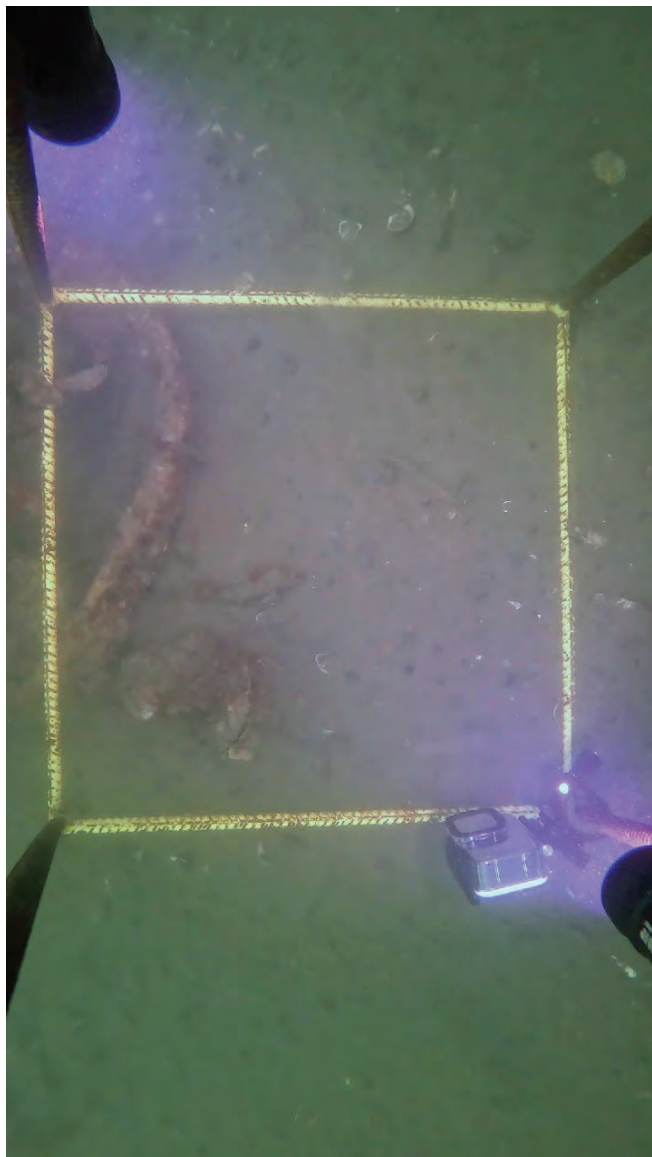
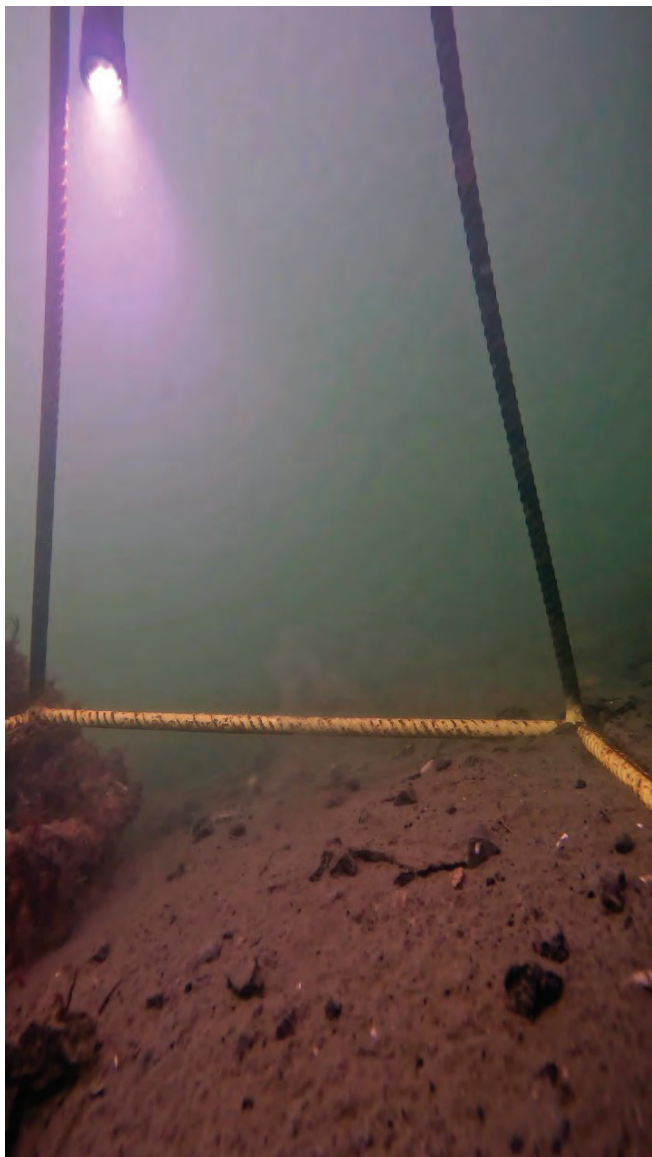
Shell rubble reef comprised of mostly mussel (Mytilidae spp.) shells. Located adjacent to Rows Wharf, near the mouth of the Fort Point Channel.

BOSTON HARBOR - LITTLE MYSTIC CHANNEL



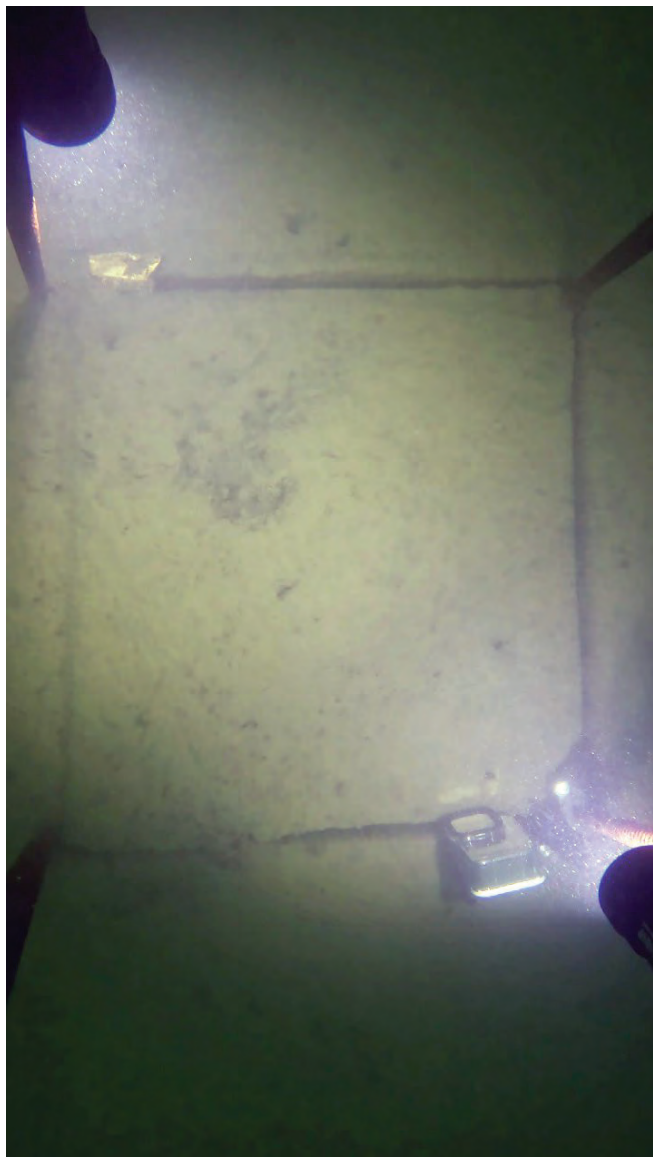
Survey Area:		Little Mystic Channel		Transect:	LM-1	Capture:	01
Date:	10/24/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.381162, -71.057460			Stop Coordinates (NAD83): 42.381215, -71.057338			Water Depth (FT): -20.7	
Plan View				Profile View			
							
Notes:							
Anthropogenic metal debris with dense cover of tunicates, sponges, ectoprocts, and hydroids. Located on the western end of Little Mystic Channel just south of the boat ramp.							

Survey Area: <i>Little Mystic Channel</i>		Transect: <i>LM-1</i>	Capture: <i>02</i>
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Start Coordinates (NAD83): <i>42.381162, -71.057460</i>		Stop Coordinates (NAD83): <i>42.381215, -71.057338</i>	Water Depth (FT): <i>-17.2</i>
Plan View		Profile View	
			
Notes: <i>Anthropogenic metal debris with dense cover of tunicates, sponges, ectoprocts, hydroids, and possibly filamentous macroalgae. Located on the western end of Little Mystic Channel just south of the boat ramp.</i>			

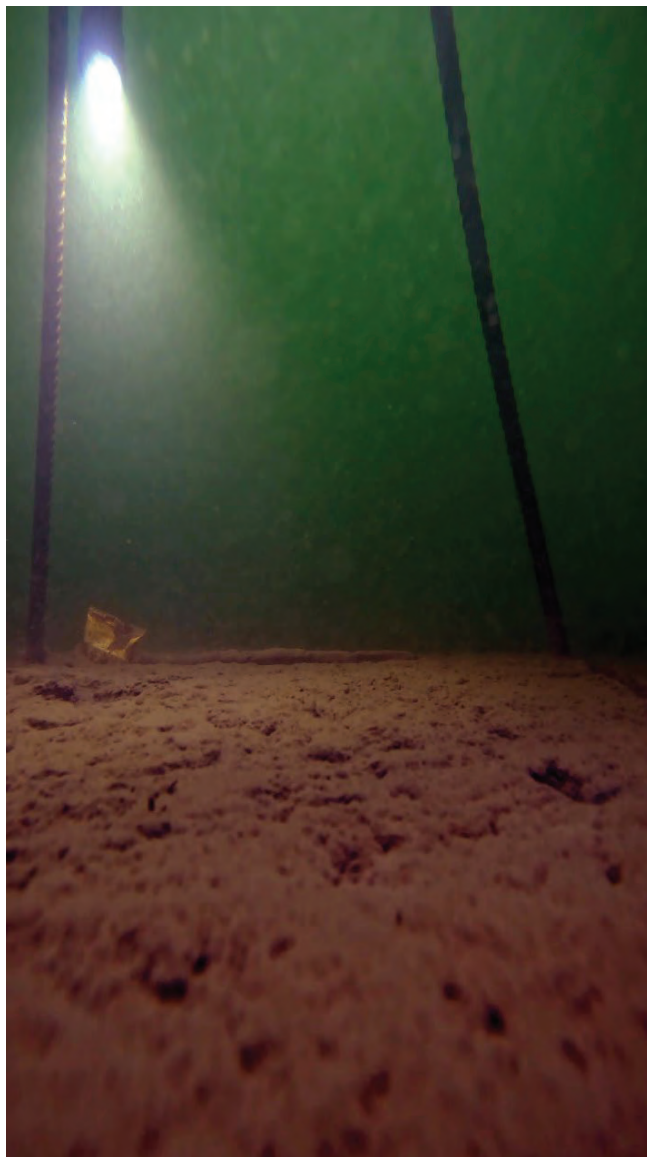
Survey Area:		Little Mystic Channel		Transect:	LM-1	Capture:	03
Date:	10/24/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.381162, -71.057460			Stop Coordinates (NAD83): 42.381215, -71.057338			Water Depth (FT): -17.2	
Plan View				Profile View			
							
Notes:							
Gravelly/shelly silt and anthropogenic metal debris with attached tunicates, sponges, ectoprocts, hydroids, and possibly filamentous macroalgae. Located on the western end of Little Mystic Channel just south of the boat ramp.							

Survey Area: <i>Little Mystic Channel</i>			Station: <i>LM-2</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.380807</i>	Longitude (NAD83): <i>-71.056220</i>		Water Depth (FT):	<i>-28.3</i>

Plan View



Profile View

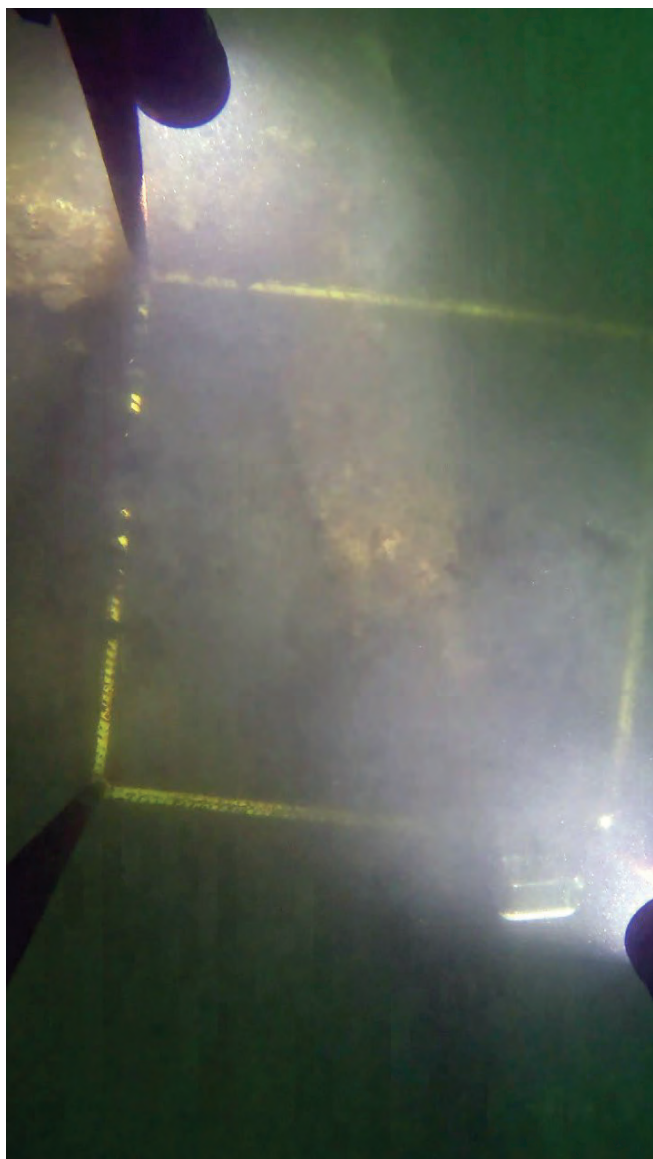


Notes:

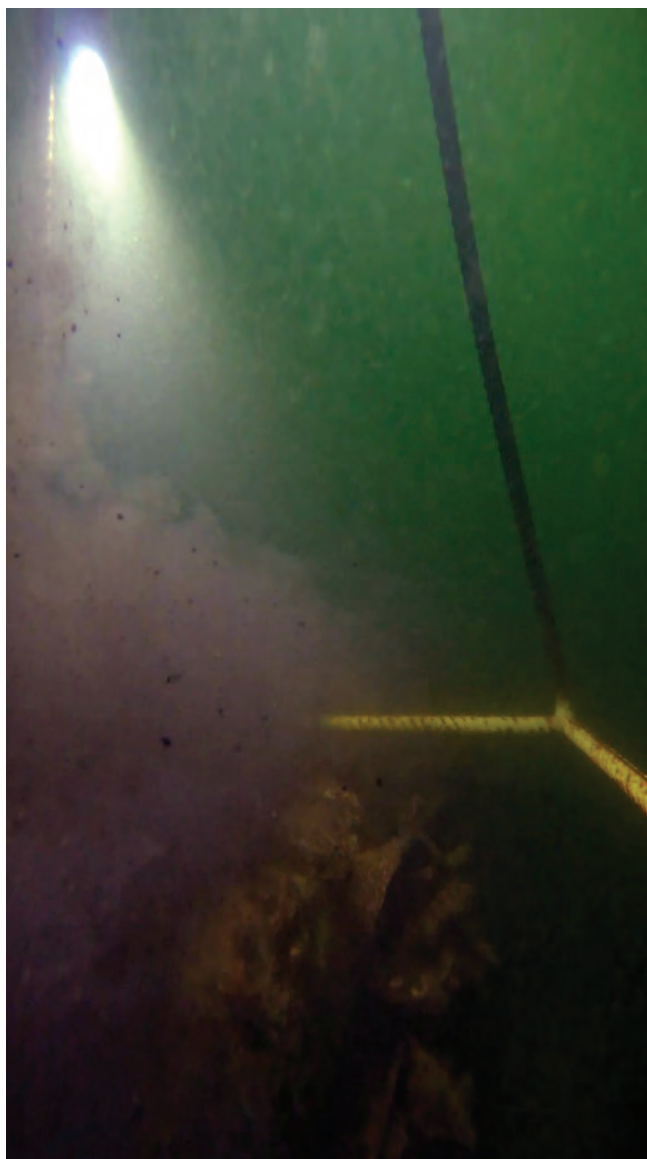
Silt with infaunal invertebrate burrows and anthropogenic debris. Located towards the western end of Little Mystic Channel.

Survey Area: <i>Little Mystic Channel</i>			Station: <i>LM-3</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.380961</i>	Longitude (NAD83): <i>-71.055945</i>		Water Depth (FT): <i>-27.2</i>	

Plan View

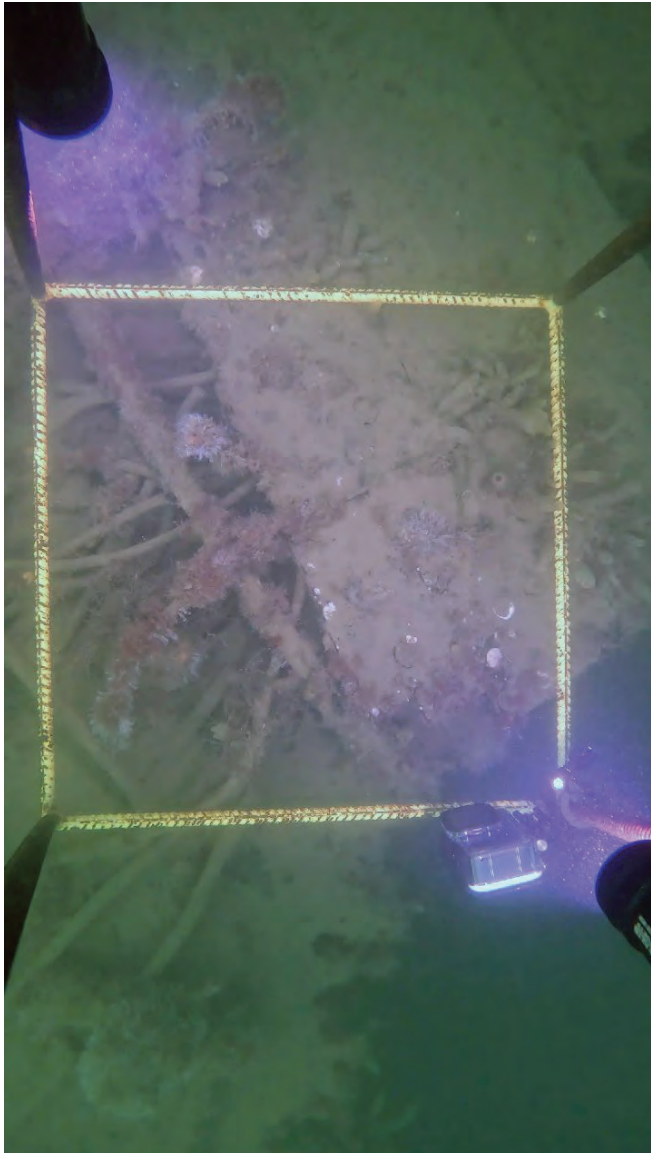
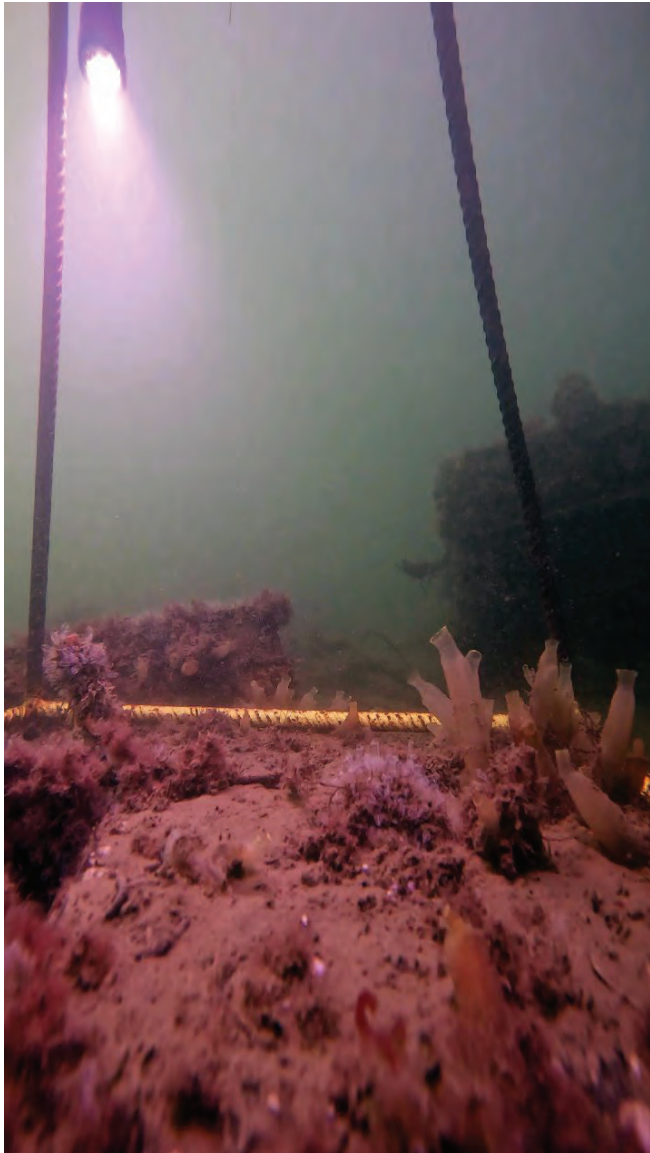


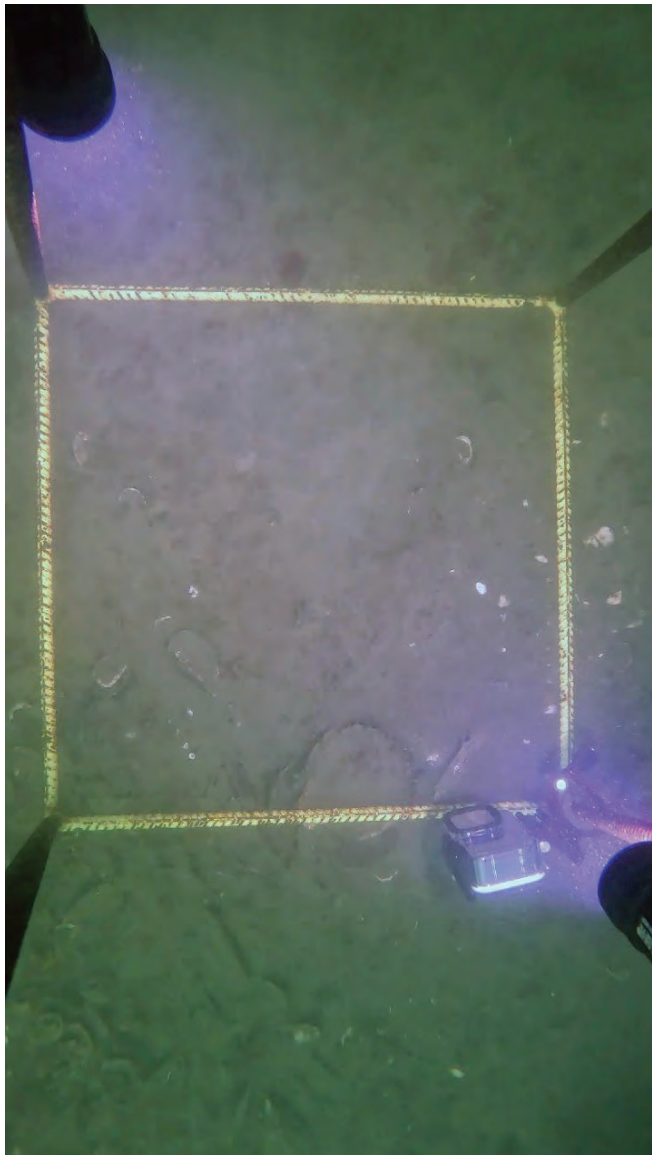
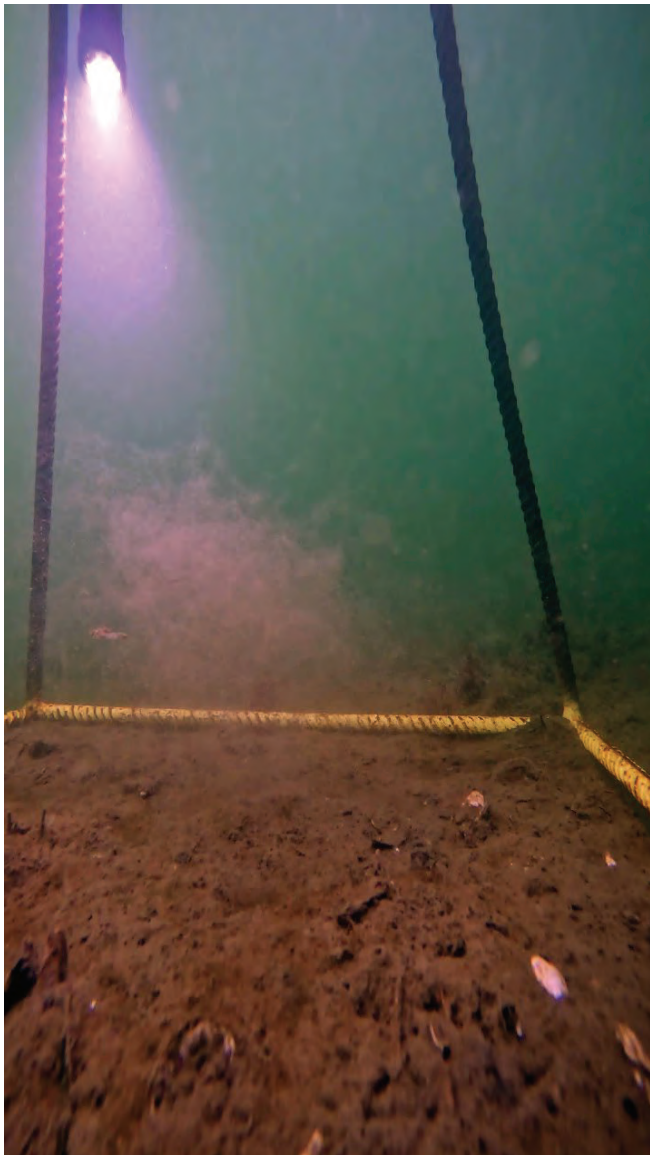
Profile View

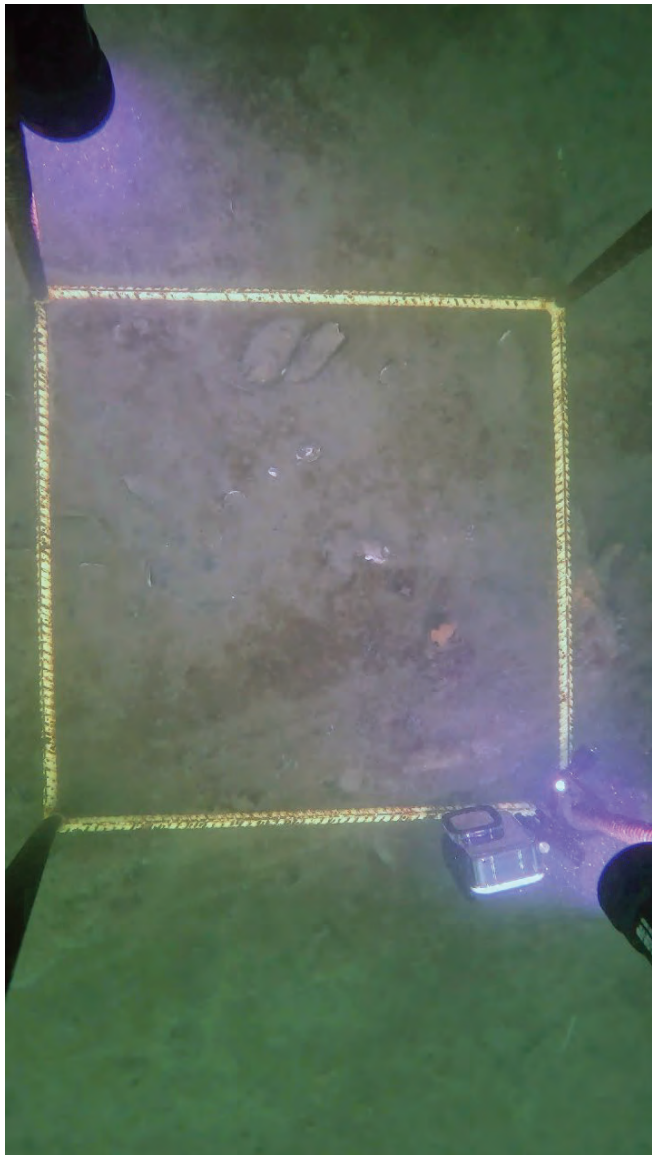


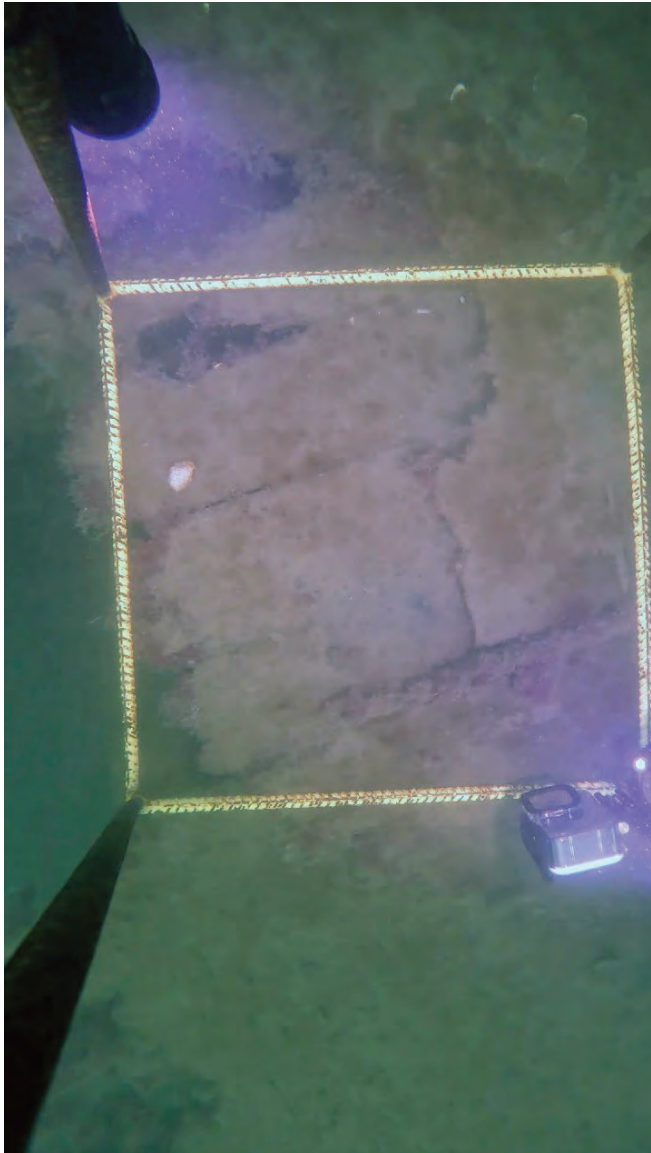
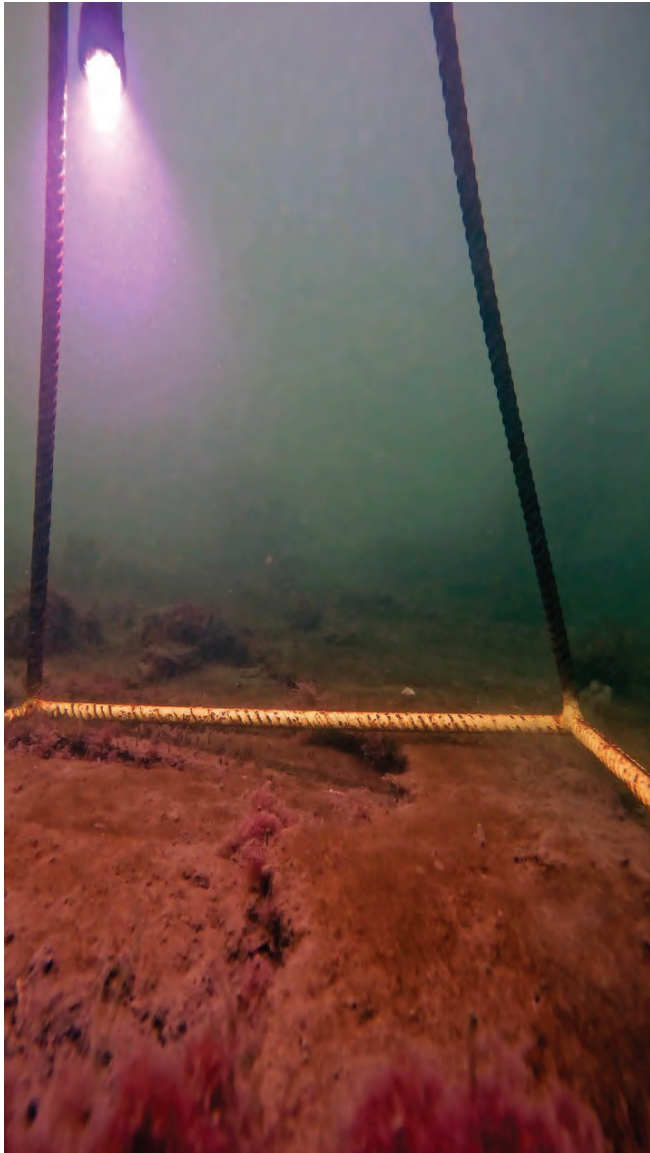
Notes:

Sunken boat covered with indeterminate fouling organisms. Located towards the western end of Little Mystic Channel.

Survey Area: <i>I</i>		Transect: <i>LM-4</i>	Capture: <i>01</i>
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Start Coordinates (NAD83): <i>42.380870, -71.055729</i>		Stop Coordinates (NAD83): <i>42.380862, -71.055618</i>	Water Depth (FT): <i>-20.6</i>
Plan View		Profile View	
			
Notes: <i>Large sunken barge covered with tunicates (Ciona intestinalis, Clavelina lepadiformis, and Styela clava), bushy ectoprocta (Bugula sp.), and mixed macroalgae. Located towards the western end of Little Mystic Channel.</i>			

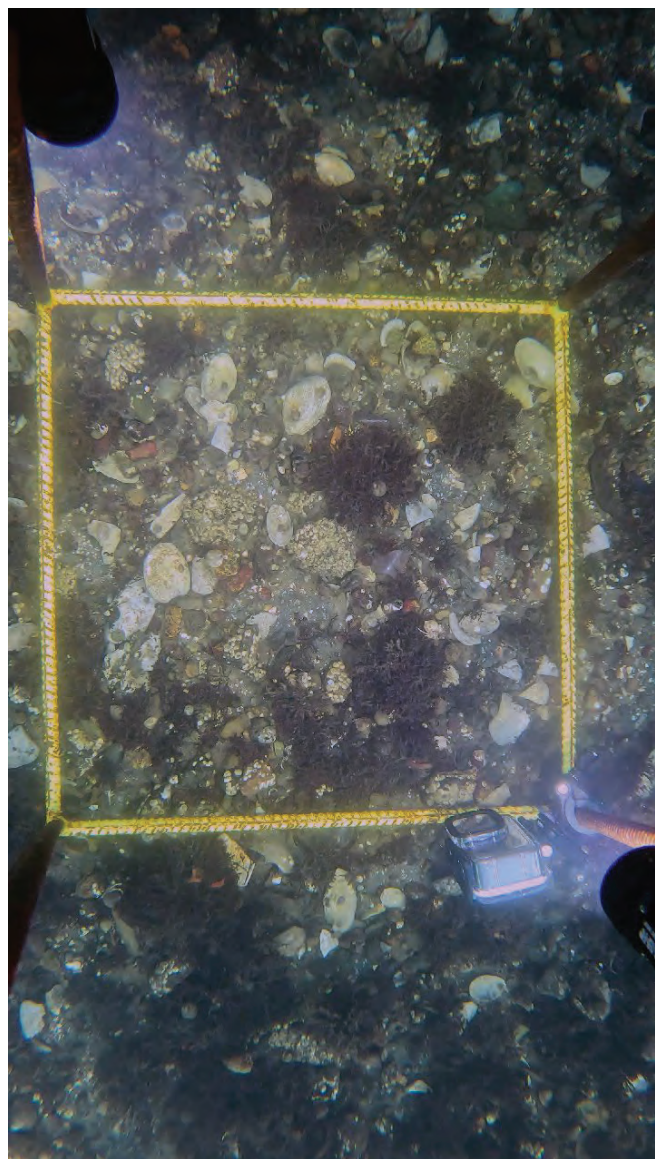
Survey Area: <i>Little Mystic Channel</i>		Transect: <i>LM-4</i>	Capture: <i>02</i>
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Start Coordinates (NAD83): <i>42.380870, -71.055729</i>		Stop Coordinates (NAD83): <i>42.380862, -71.055618</i>	Water Depth (FT): <i>-20.6</i>
Plan View		Profile View	
			
Notes: <i>Deck of large sunken barge covered in silt and shell hash/rubble. Located towards the western end of Little Mystic Channel.</i>			

Survey Area: <i>Little Mystic Channel</i>		Transect: <i>LM-4</i>	Capture: <i>03</i>
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Start Coordinates (NAD83): <i>42.380870, -71.055729</i>		Stop Coordinates (NAD83): <i>42.380862, -71.055618</i>	Water Depth (FT): <i>-20.6</i>
Plan View		Profile View	
			
Notes: <i>Deck of large sunken barge covered in silt and shells. Thin cover of microbial algae visible. Trace encrusting sponges and filamentous macroalgae. Located towards the western end of Little Mystic Channel.</i>			

Survey Area:		Little Mystic Channel		Transect:	LM-4	Capture:	04
Date:	10/24/2023	Vessel:	R/V Nomad	Platform:	0.25m ² drop frame - plan and profile cameras		
Start Coordinates (NAD83): 42.380870, -71.055729			Stop Coordinates (NAD83): 42.380862, -71.055618			Water Depth (FT): -20.6	
Plan View				Profile View			
							
Notes:							
Deck of large sunken barge covered with a thin cover of microbial algae with trace tufts of filamentous macroalgae. Located towards the western end of Little Mystic Channel.							

Survey Area: <i>Little Mystic Channel</i>			Station: <i>LM-5</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.380051</i>	Longitude (NAD83): <i>-71.053372</i>		Water Depth (FT): <i>-3.4</i>	

Plan View



Profile View

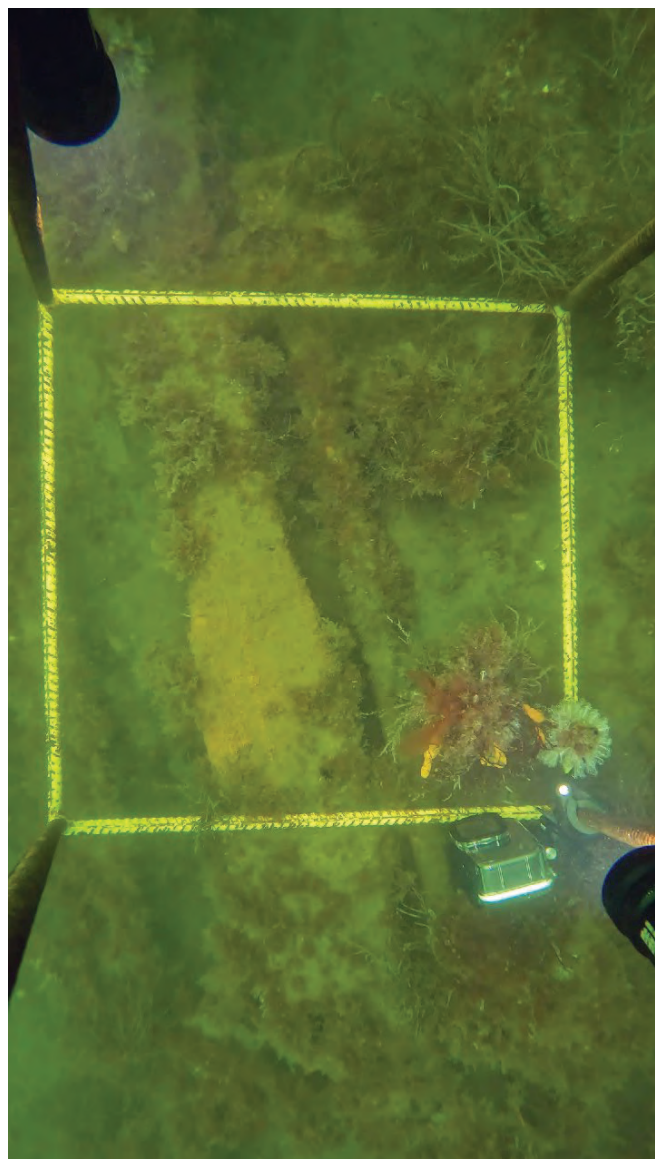


Notes:

Gravel and shells with sparse cover of leathery/leafy macroalgae (likely Chondrus crispus). Located on the southern edge of Little Mystic Channel adjacent to Barry Field.

Survey Area: <i>Little Mystic Channel</i>			Station: <i>LM-6</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>		Platform: <i>0.25m² drop frame - plan and profile cameras</i>	
Latitude (NAD83): <i>42.380764</i>		Longitude (NAD83): <i>-71.052789</i>		Water Depth (FT): <i>-10.6</i>

Plan View



Profile View



Notes:

Anthropogenic metal debris with dense cover of mixed macroalgae, bushy ectoprocts (Bugula sp.), hydroids, encrusting sponges and tunicates (Clavelina lepadiformis and Styela clava). Located on the northern edge of Little Mystic Channel approximately 300 feet west of the Chelsea Street Bridge.

Survey Area: <i>Little Mystic Channel</i>			Station: <i>LM-7</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.379939</i>	Longitude (NAD83): <i>-71.049614</i>		Water Depth (FT): <i>-36.9</i>	

Plan View



Profile View

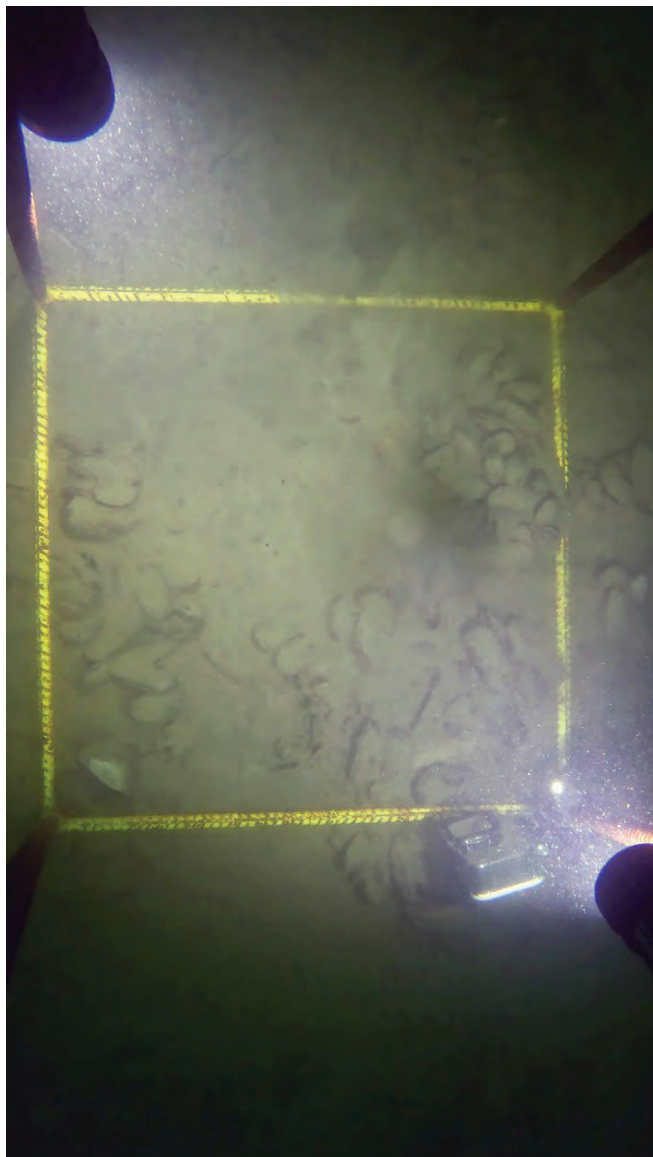


Notes:

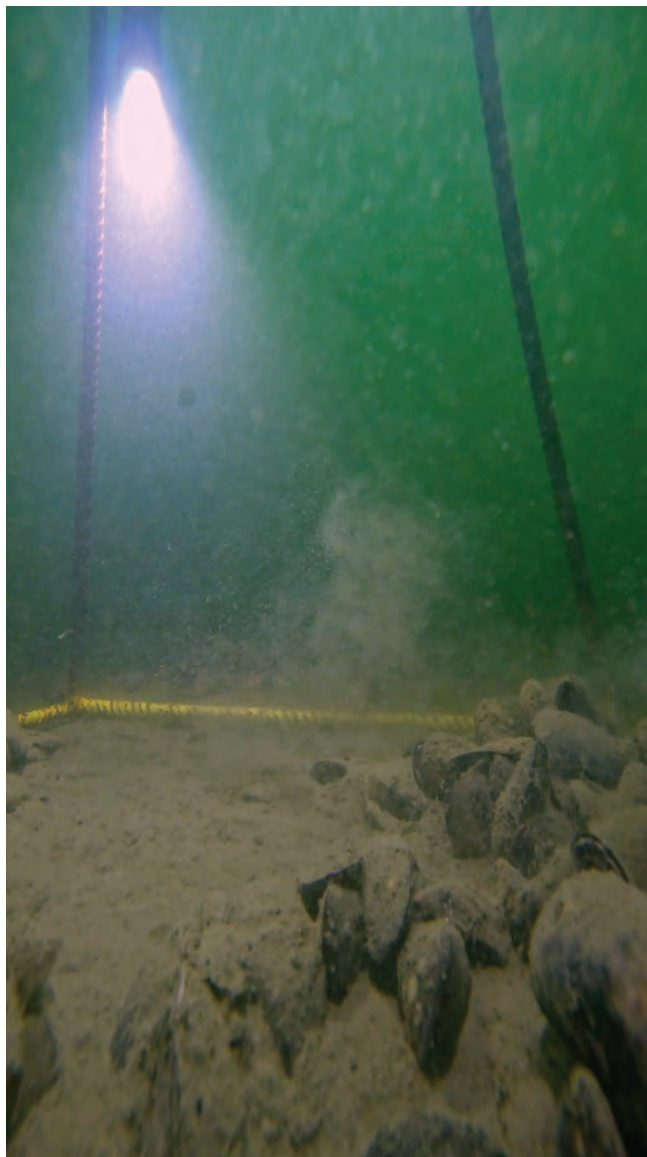
Bare silt with infaunal invertebrate tubes and burrows. Several tunicates (likely Molgulidae sp., Styaela clava, or Ascidiella aspersa) present as well. Located near Mystic Marine Fuel.

Survey Area: <i>Little Mystic Channel</i>			Station: <i>LM-8</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.379136</i>	Longitude (NAD83): <i>-71.048053</i>		Water Depth (FT): <i>-35.0</i>	

Plan View



Profile View



Notes:

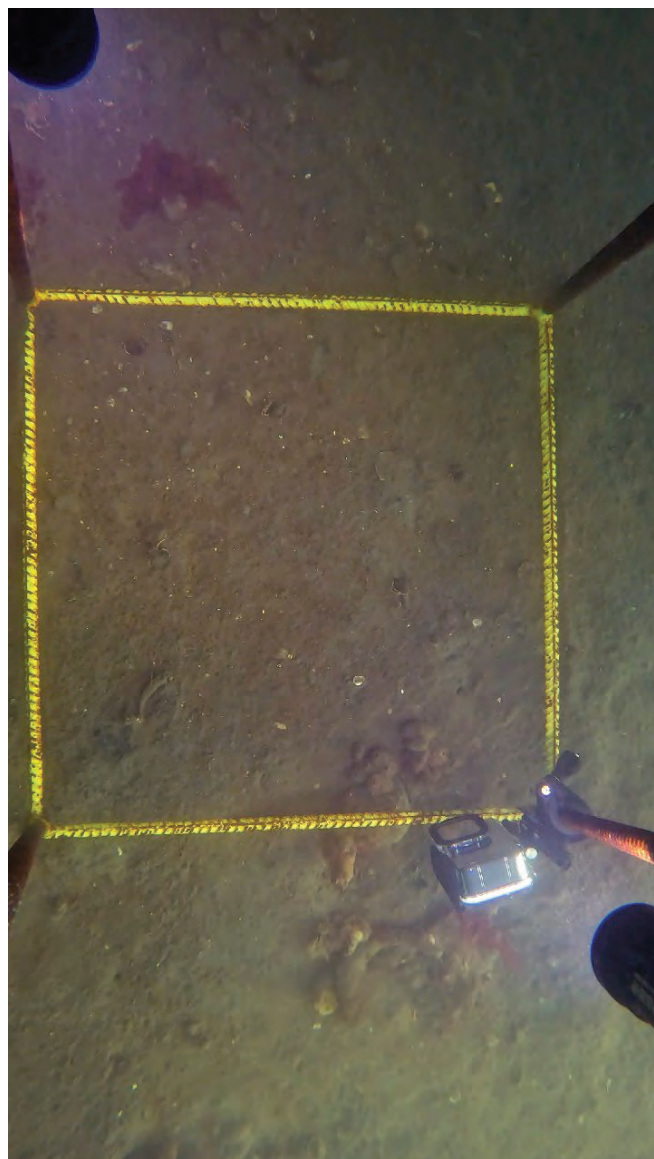
Silt and mussel reef. Located at the mouth of Little Mystic Channel near Spaulding Park.

BOSTON HARBOR - CHELSEA RIVER



Survey Area: <i>Chelsea River</i>			Station: <i>CR-1</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.386501</i>	Longitude (NAD83): <i>-71.020414</i>		Water Depth (FT):	<i>-5.3</i>

Plan View



Profile View

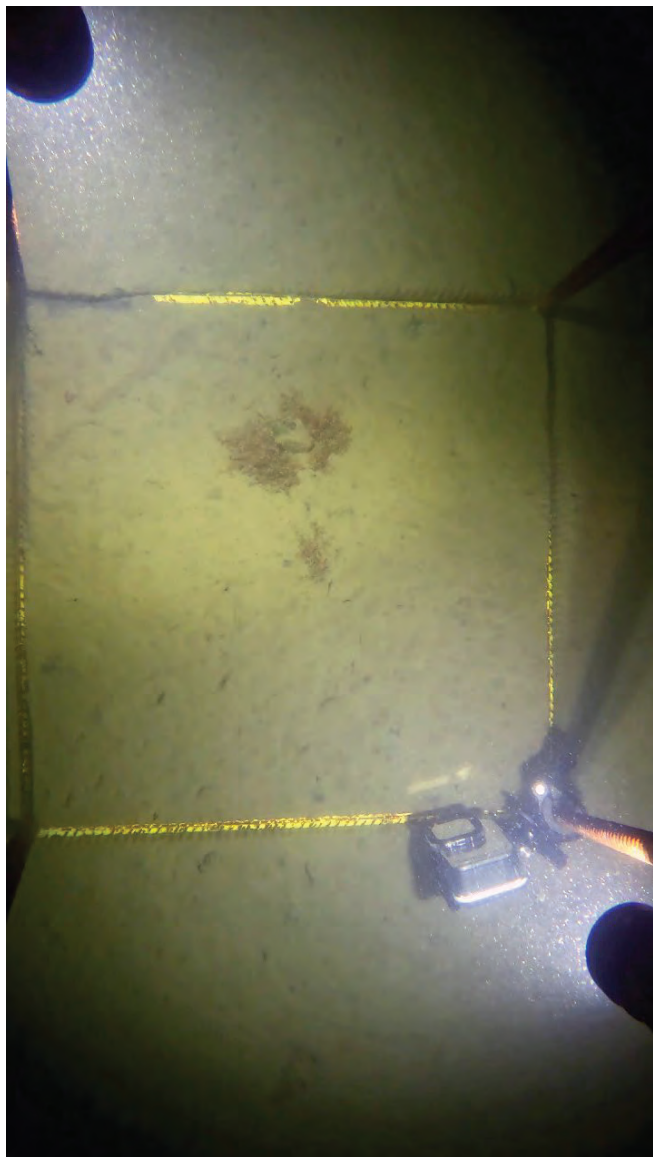


Notes:

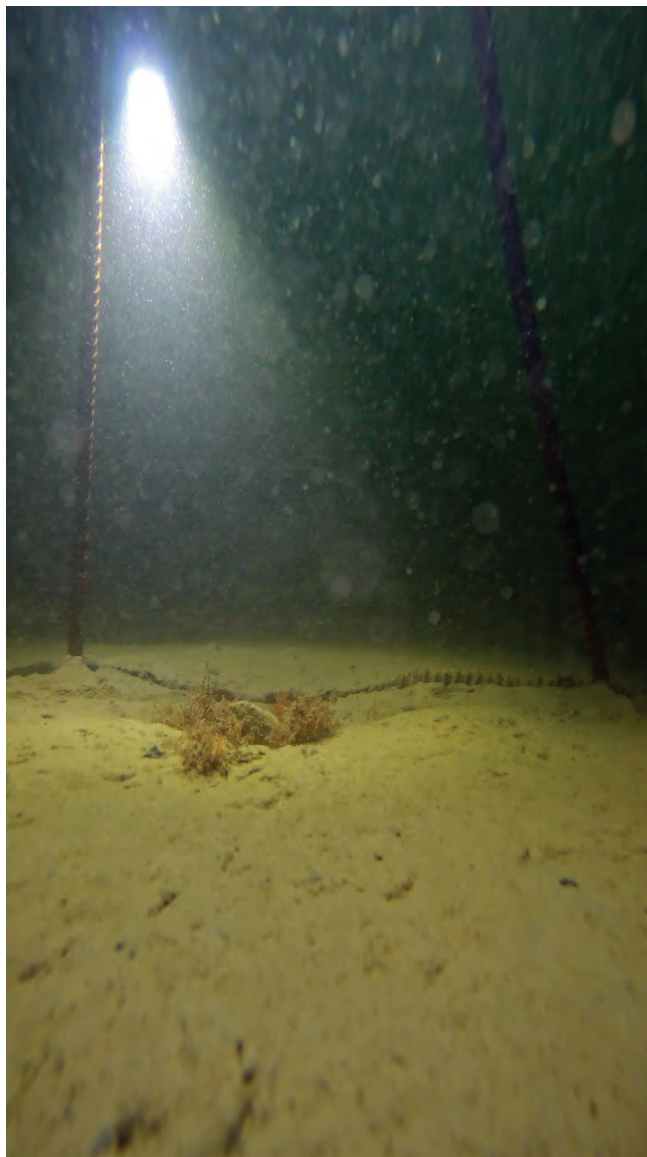
Sand with sparse gravel and shell hash. Several hermit crabs (*Paguridae* sp.) present. Sparse cover of red sheet macroalgae and tunicates (likely *Molgulidae* sp., *Styela clava*, or *Ascidella aspersa*) attached to hard substratum. Located near the East Boston shoreline, outside of the federal channel.

Survey Area: <i>Chelsea River</i>			Station: <i>CR-2</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.387856</i>	Longitude (NAD83): <i>-71.019612</i>		Water Depth (FT): <i>-54.4</i>	

Plan View



Profile View

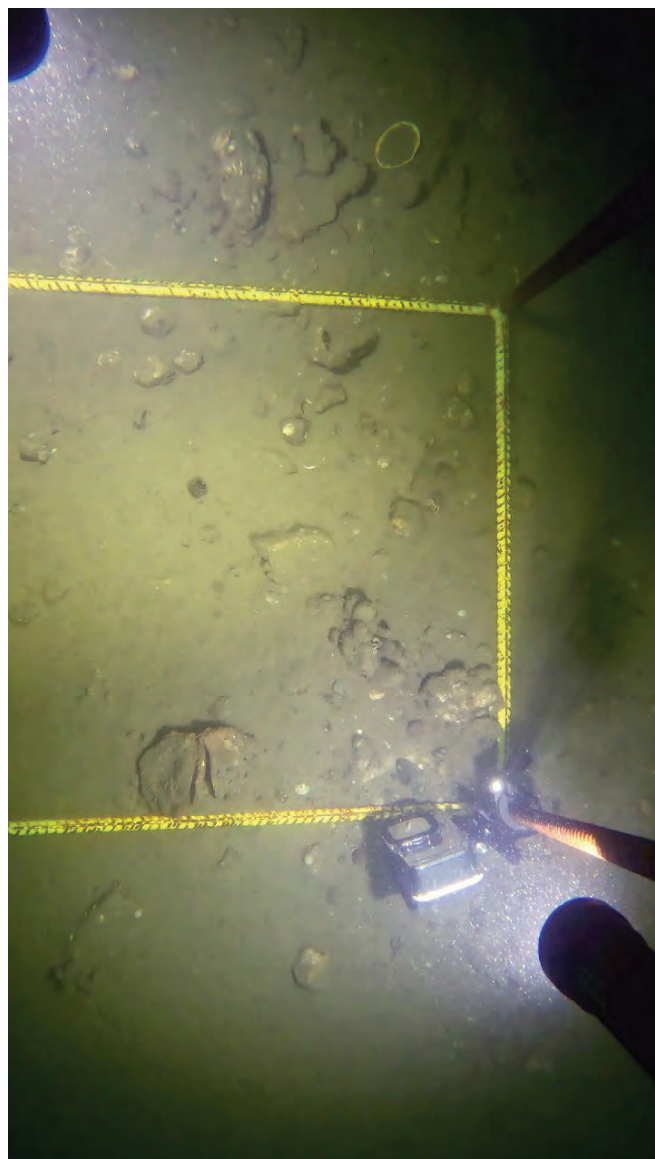


Notes:

Silt and trace gravel with attached bushy ectoprocta (Bugula sp.) Infaunal invertebrate burrows present. Located within the footprint of the Boston Harbor Chelsea River CAD Cell.

Survey Area: <i>Chelsea River</i>			Station: <i>CR-3</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.389127</i>	Longitude (NAD83): <i>-71.018698</i>		Water Depth (FT): <i>-43.0</i>	

Plan View



Profile View

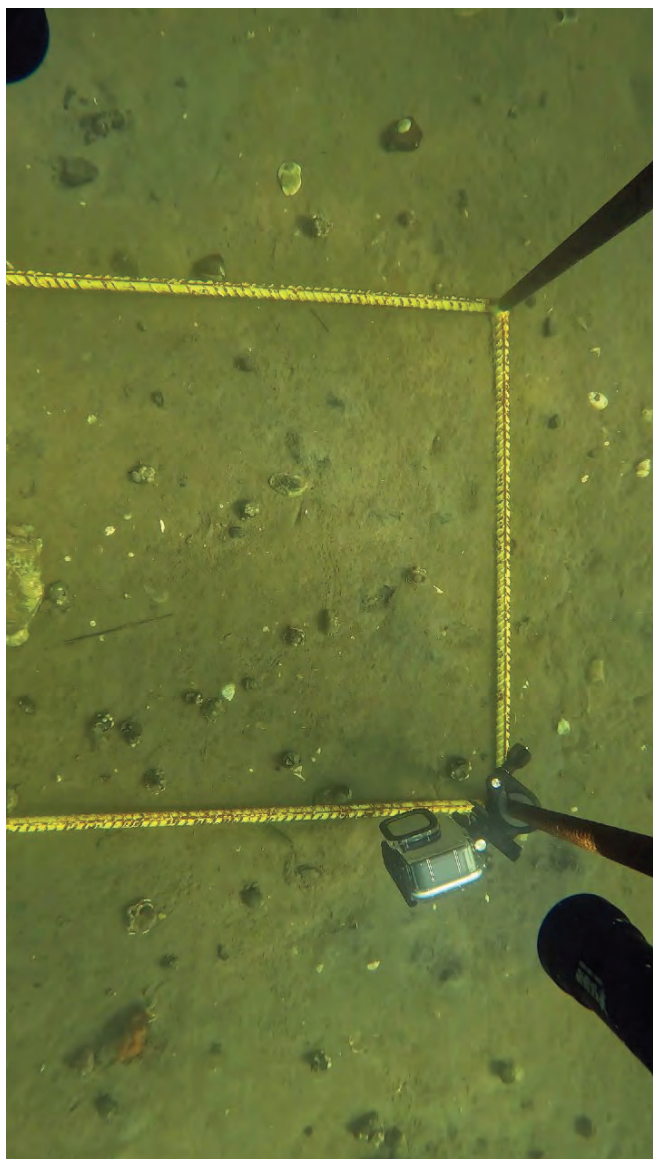


Notes:

Sandy silt with sparse to moderate gravel and shell hash/rubble. Juvenile flounder (Pleuronectiformes sp.) present within quadrat. Located within the 35-foot Chelsea River Channel.

Survey Area: <i>Chelsea River</i>			Station: <i>CR-4</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.389461</i>	Longitude (NAD83): <i>-71.017508</i>		Water Depth (FT):	<i>-3.8</i>

Plan View



Profile View

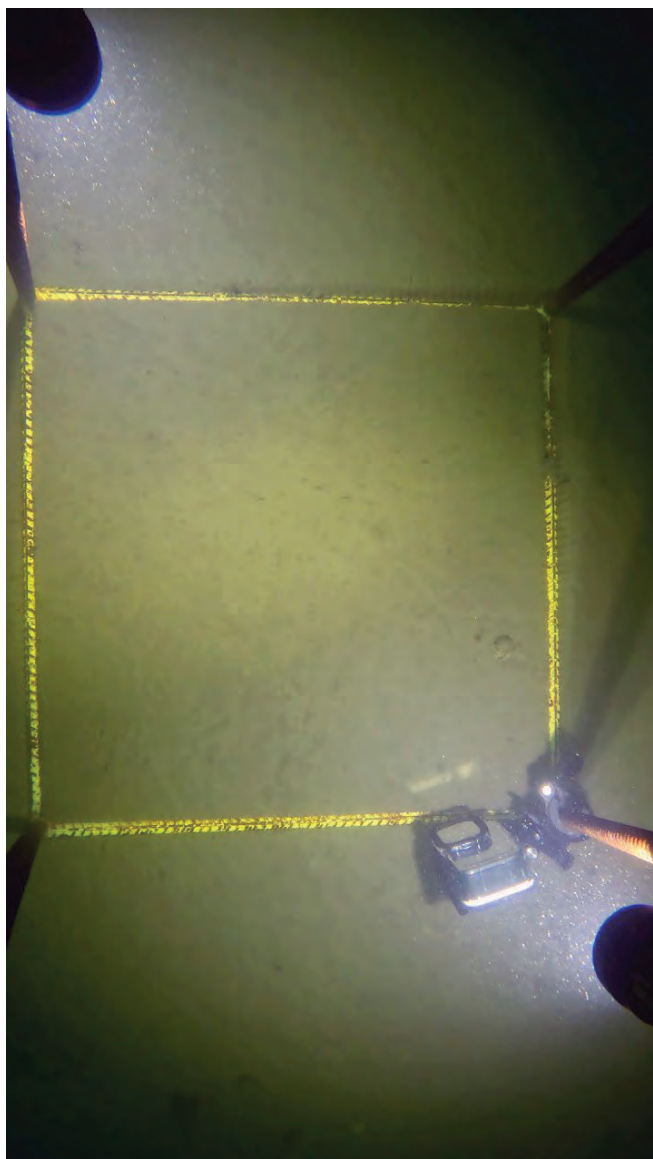


Notes:

Sand with sparse shell hash/rubble and gravel. Several hermit crabs (Paguridae sp.) present. Located near the East Boston shoreline, outside of the federal channel.

Survey Area: <i>Chelsea River</i>			Station: <i>CR-5</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.391256</i>	Longitude (NAD83): <i>-71.016837</i>		Water Depth (FT): <i>-40.0</i>	

Plan View



Profile View



Notes:

Bare silt with sparse small infaunal invertebrate tubes and burrows. Hermit crab (*Paguridae* sp.) and corresponding tracks present. Adult flounder (*Pleuronectiformes* sp.) visible in background of the profile-view image. Located within the 35-foot Chelsea River Channel.

Survey Area: <i>Chelsea River</i>			Station: <i>CR-6</i>	
Date: <i>10/24/2023</i>	Vessel: <i>R/V Nomad</i>	Platform: <i>0.25m² drop frame - plan and profile cameras</i>		
Latitude (NAD83): <i>42.392147</i>	Longitude (NAD83): <i>-71.015746</i>		Water Depth (FT): <i>-5.0</i>	

Plan View



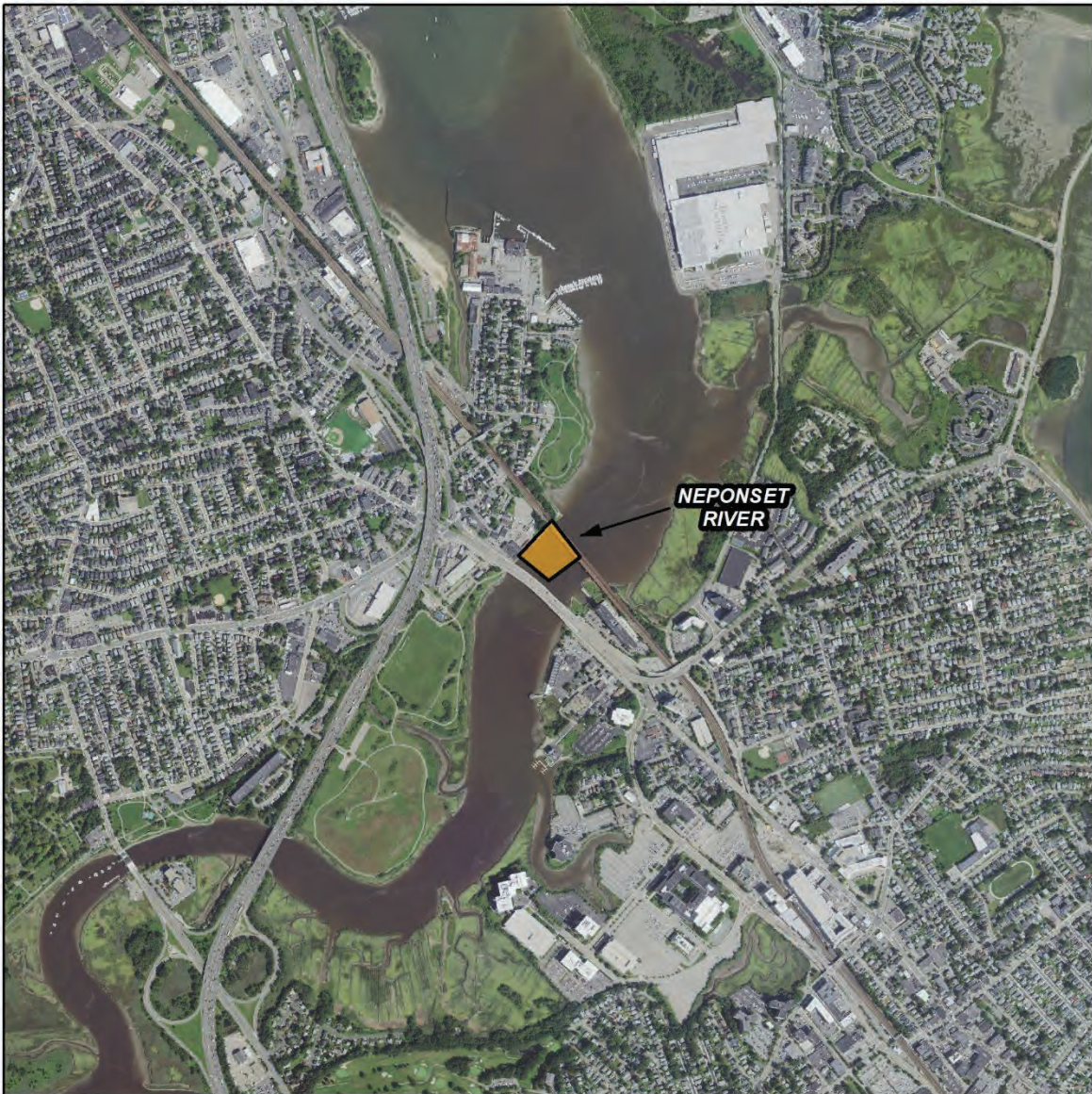
Profile View

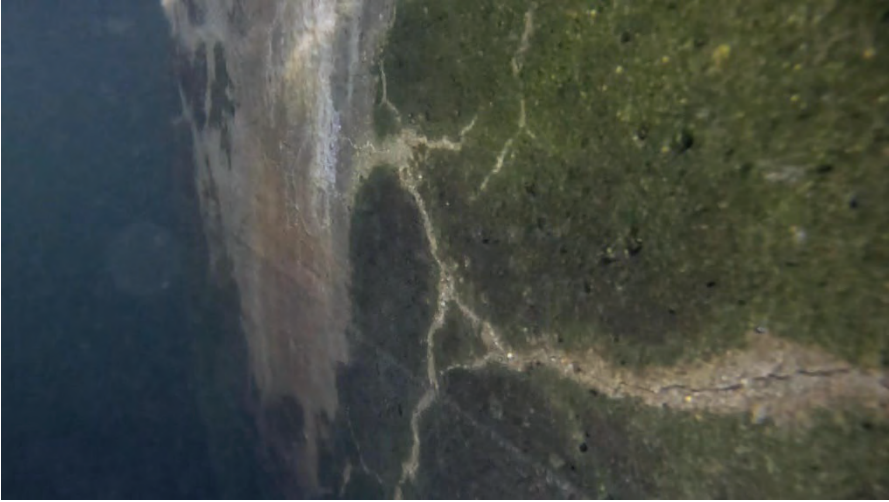


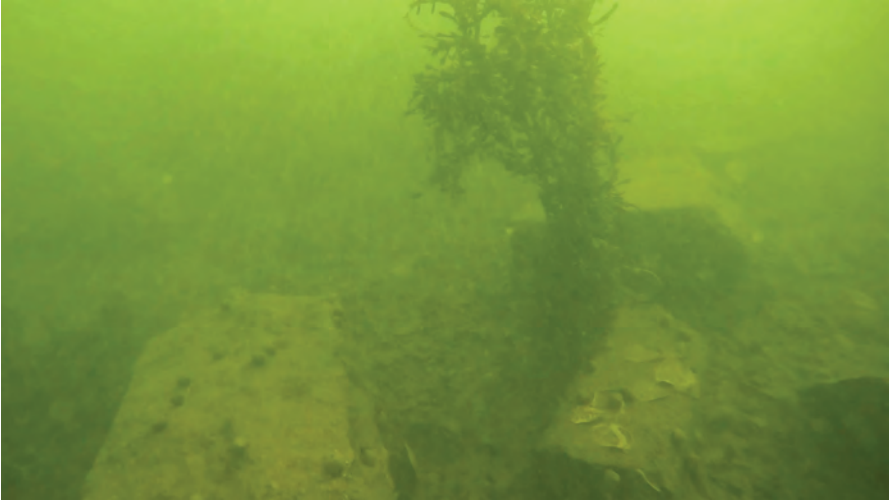
Notes:

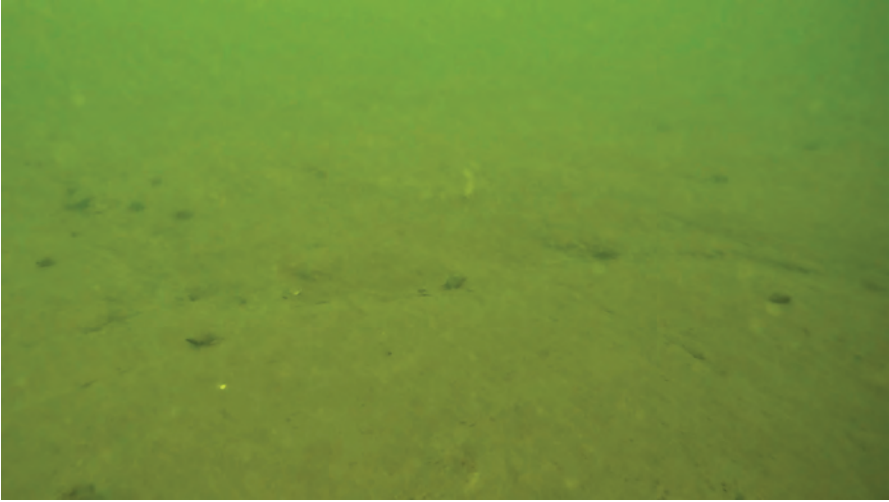
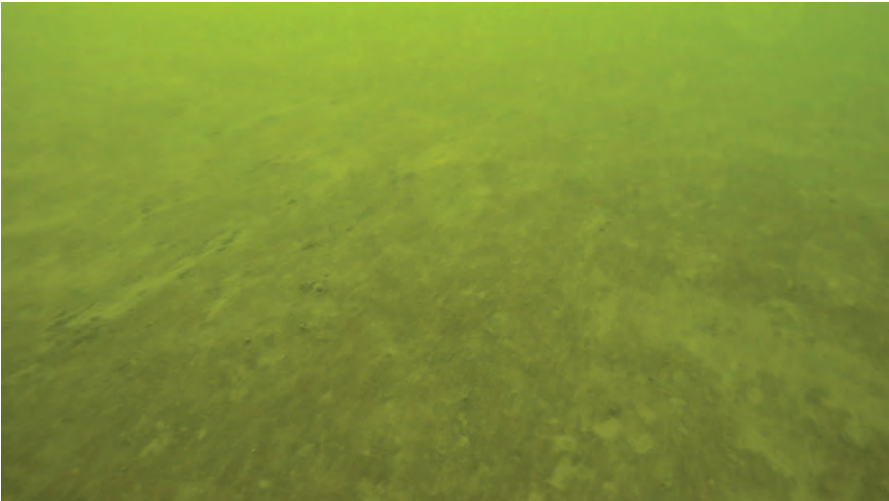
Gravel and shell debris with a moderate cover of barnacles (Balanidae spp.). Located near the East Boston shoreline, outside of the federal channel.

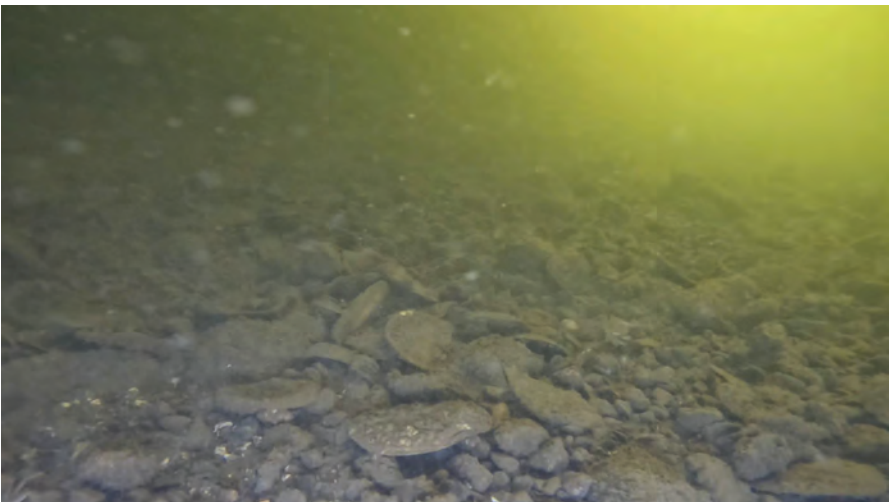
NEPONSET RIVER



Survey Area: <i>Neponset River – Western Shoreline Seawall</i>		Date: <i>10/26/2023</i>
Image		Description
		- <i>Typical conditons along concrete seawall</i>
		- <i>Derelict pilings forward of concrete seawall structure</i>
		- <i>Base of derelict pilings forward of concrete seawall structure</i> - <i>Algae, barnacles</i>

Survey Area: <i>Neponset River Western Shoreline – Intertidal/Shallow Subtidal Flat</i>		Date: <i>10/26/2023</i>
Image		Description
		- <i>Sandy gravel and shell with small boulders and anthropogenic debris adjacent to western seawall</i>
		- <i>Sandy gravel and shell with angular stone blocks and attached macroalgae</i>
		- <i>Edge of shoreline adjacent coarse material, sand gravel and shell transitioning to sandy silt</i>

Survey Area: <i>Neponset River – Subtidal Flat/ Channel Side Slope</i>		Date: 10/26/2023
Image		Description
		- Bare silt with hermit crabs (<i>Paguridae</i> sp.) and associated tracks
		- Bare silt with a thin layer of microbial alga. Epifaunal invertebrate tracks visible
		- Bare silt with epifaunal invertebrate tracks visible

Survey Area: <i>Neponset River – Bridge Piers and Adjacent Riverbed</i>		Date: 10/26/2023
Image		Description
		- Granite pier blocks in water column with algal growth, barnacles, and a crab visible on the structure
		- Base of the closest bridge pier structure with adjacent scoured coarse sediment
		- Scoured coarse sediment and debris adjacent to bridge pier structure