DATA REPORT
Habitat Characterization Survey
In Support of Project Design

FINAL

Boston Harbor Coastal Storm Risk Management Feasibility study Boston, MA

US Army Corps of Engineers ®
New England District

December 2024

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HABITAT CHARACTERIZATION SURVEY

IN SUPPORT OF PROJECT DESIGN

BOSTON HARBOR COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

BOSTON, MA

December 2024

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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.

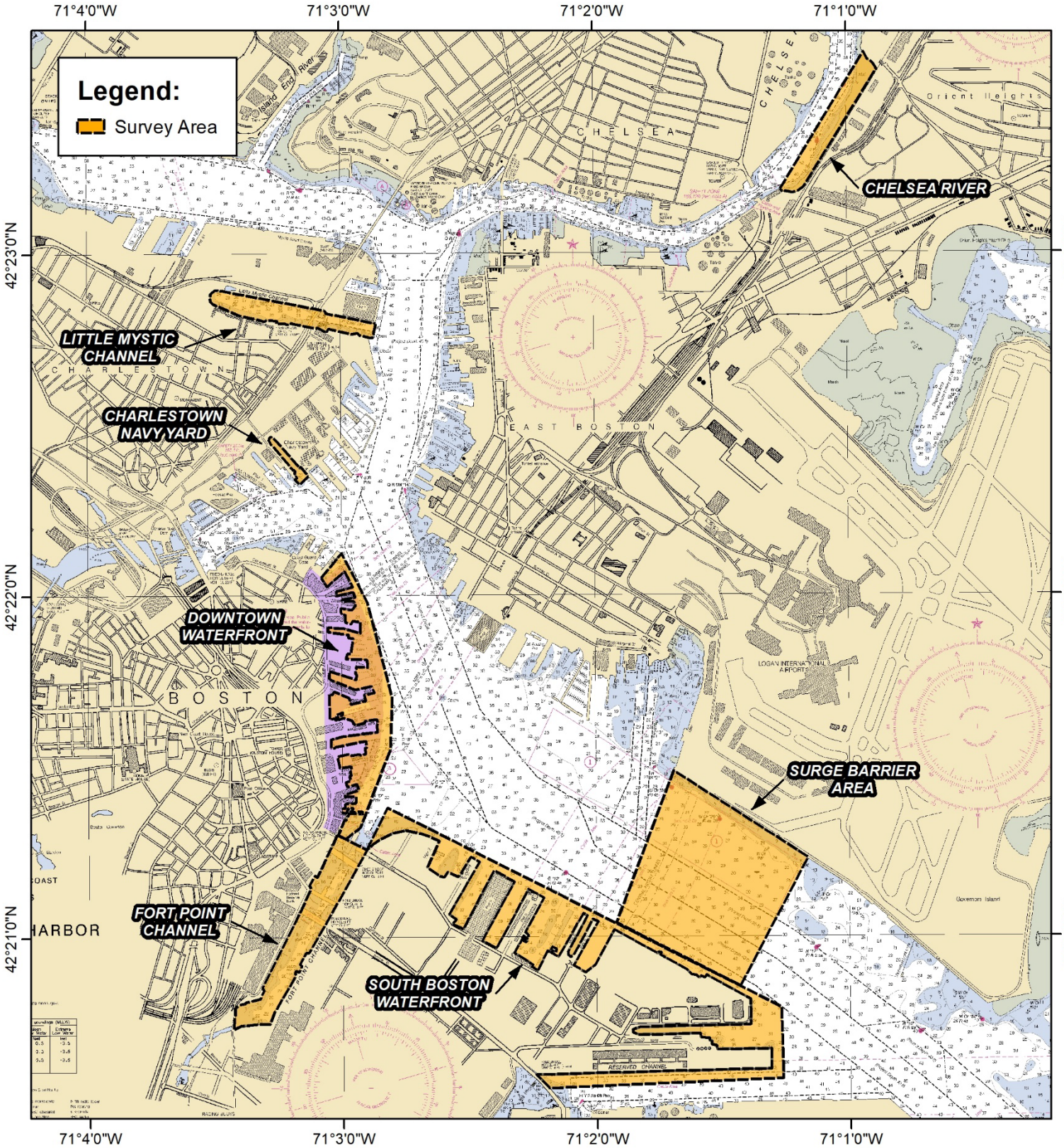

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FIGURE 1:
BOSTON HARBOR CSRM
2023 SURVEY AREAS

0 1,000 2,000 3,000 4,000 5,000 Feet

0 250 500 750 1,000 Meters

1:29,000

NOAA CHART 13272

GCS NAD1983

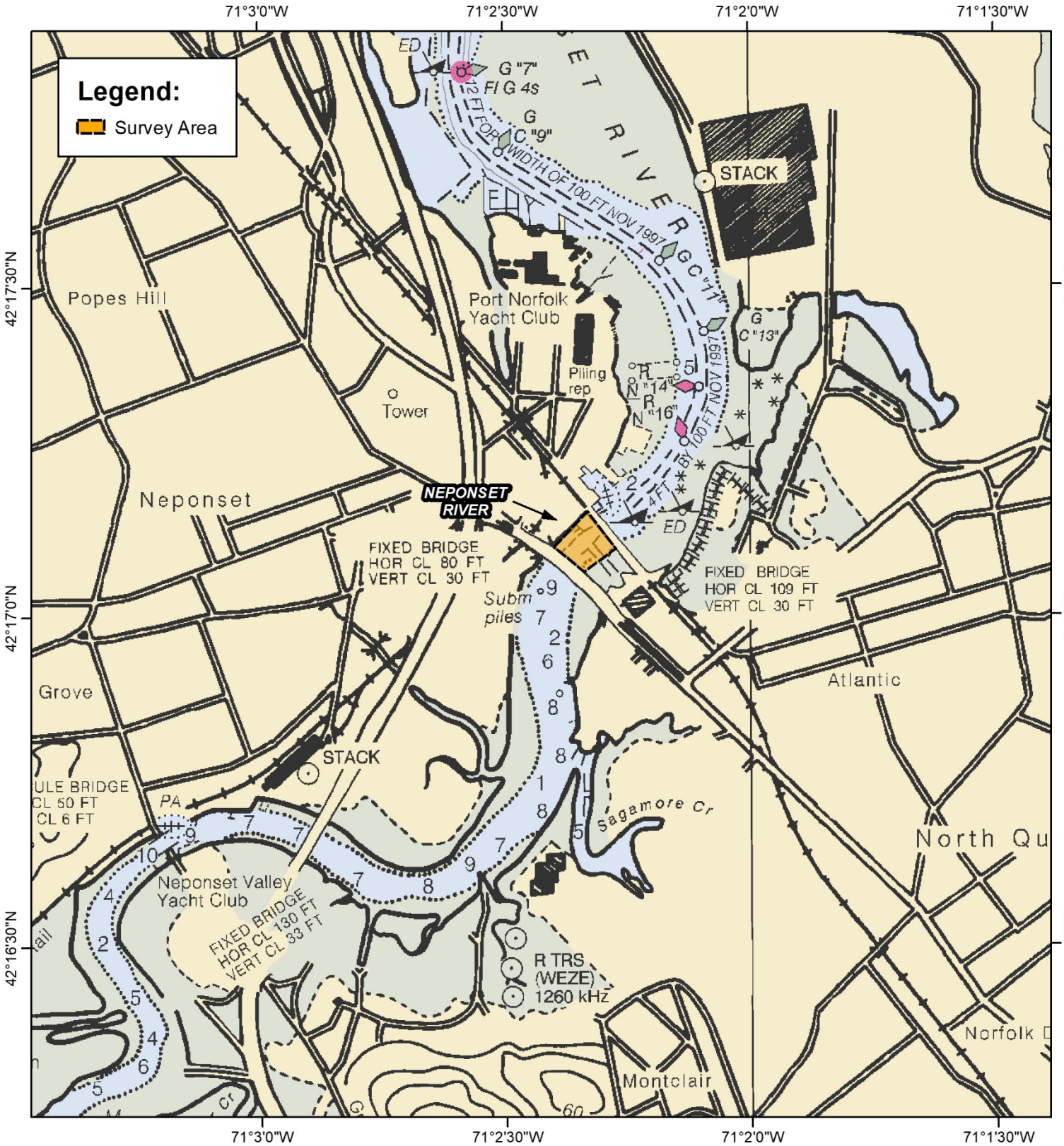

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FIGURE 2:
BOSTON HARBOR CSRM
2023 SURVEY AREAS

0 1,000 2,000 3,000 Feet

0 250 500 750 Meters

1:15,000

NOAA CHART 13270

GCS NAD1983

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 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

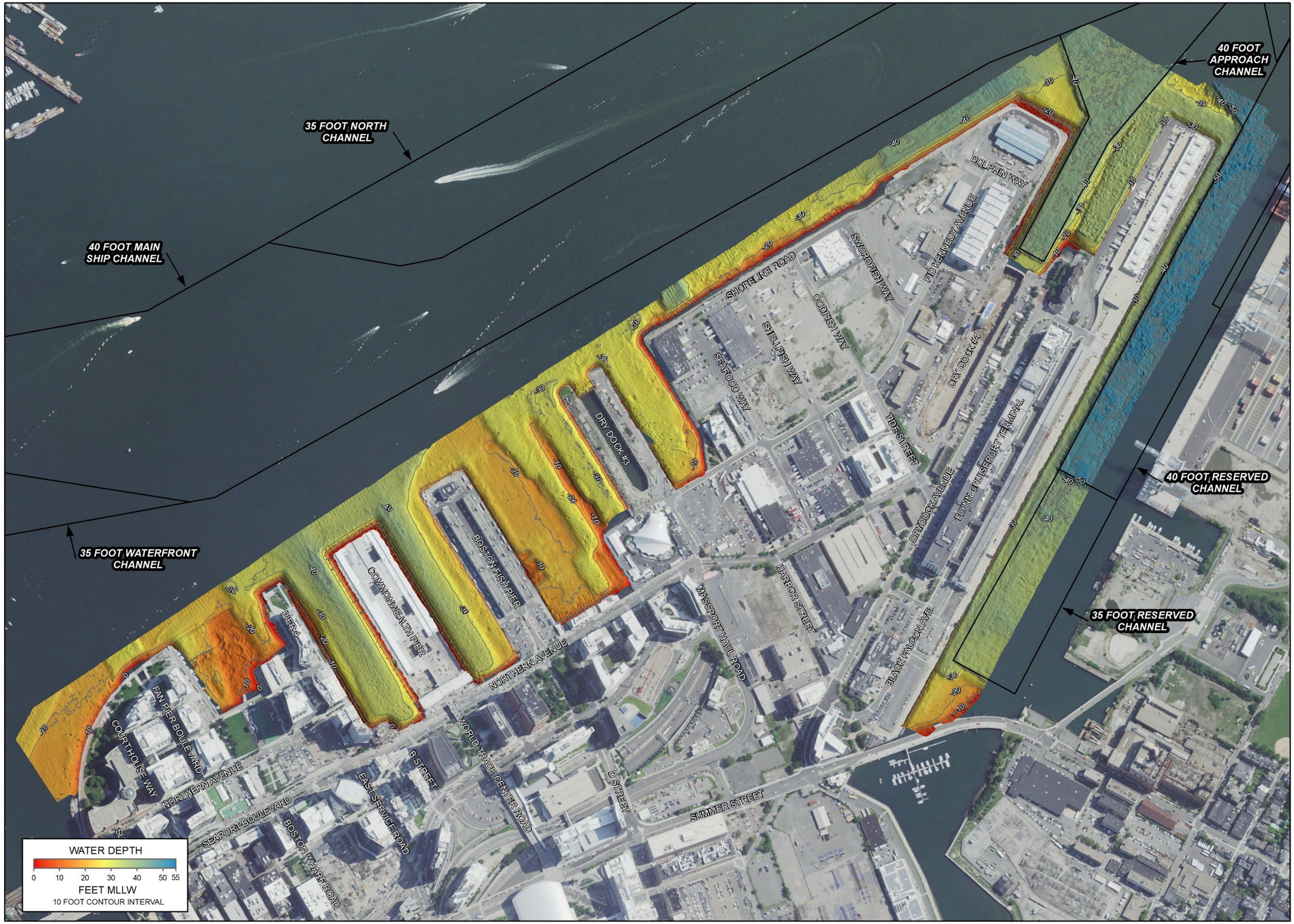
Cruiseport terminal. The seabed to the south of the Cruiseport dropped steeply from -30 feet into the -40 and -35 foot sections of the Reserved Channel, with recent dredge cuts in isolated portions of each area reaching -50 and -40 feet, respectively. The surveyed footprint above the head of the Reserved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

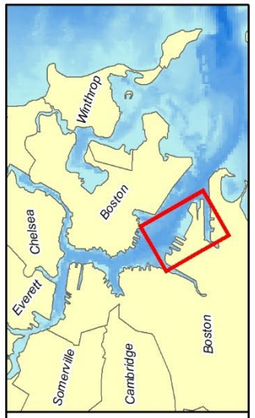
Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and pier structures throughout the investigation area, transitioning to ambient soft sediments. Evidence of recent anthropogenic interaction with the seabed were observed in the 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 *Ascidiella 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.





THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE SOUTH BOSTON WATERFRONT COMPONENT OF THE BOSTON HARBOR CSRM STUDY

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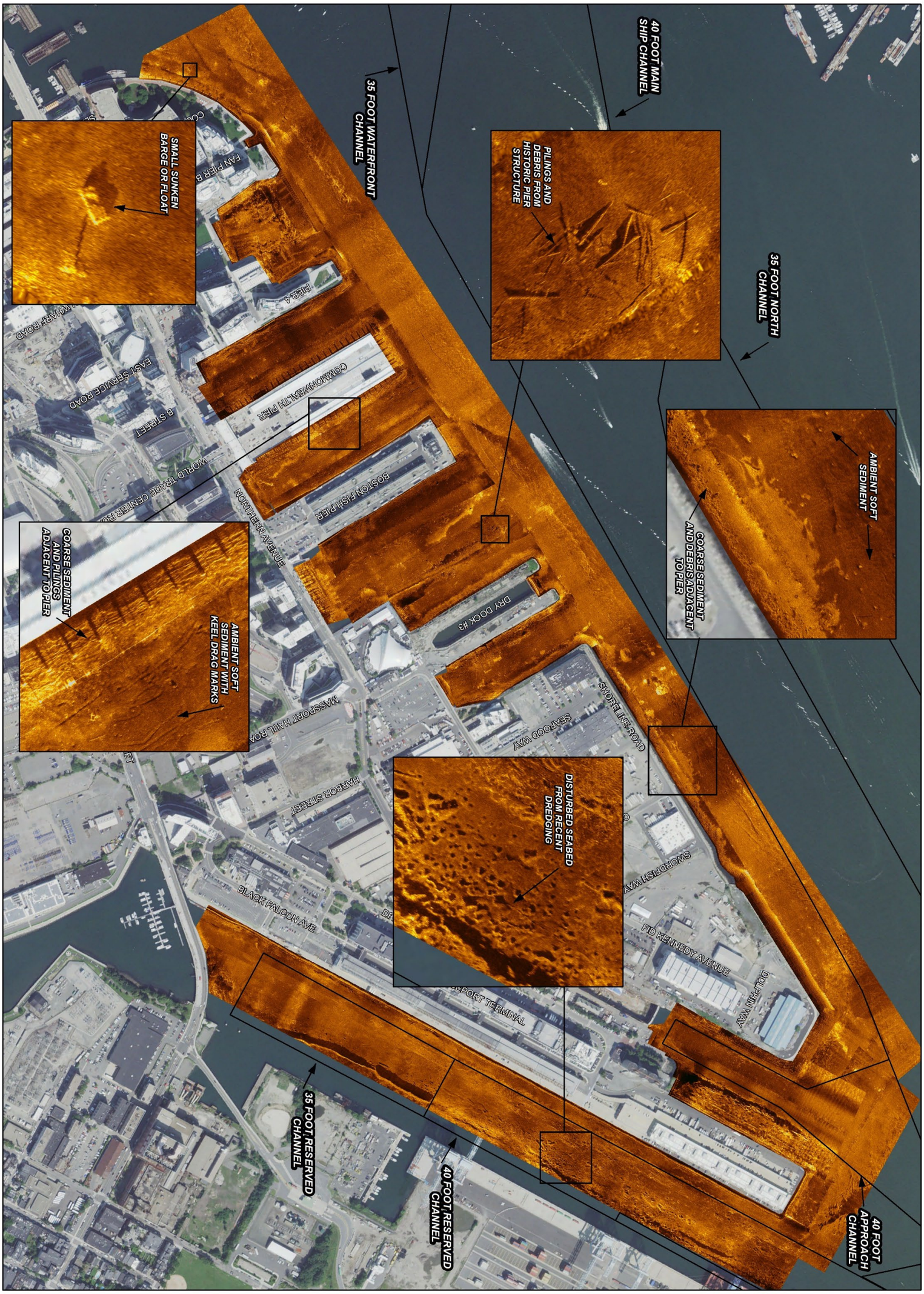
FIGURE 3:
BOSTON HARBOR, SOUTH BOSTON WATERFRONT
2023 BATHYMETRY

0 500 1,000 1,500 Feet
0 100 200 300 Meters
1:6,750

GCS NAD1983

2021 NAIP AERIAL IMAGERY



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New England District

FIGURE 4:
BOSTON HARBOR, SOUTH BOSTON WATERFRONT
2023 SIDE SCAN SONAR MOSAIC

0 500 1,000 1,500 Feet
0 100 200 300 Meters
1:6,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE SOUTH BOSTON WATERFRONT COMPONENT OF THE BOSTON HARBOR CSRM STUDY

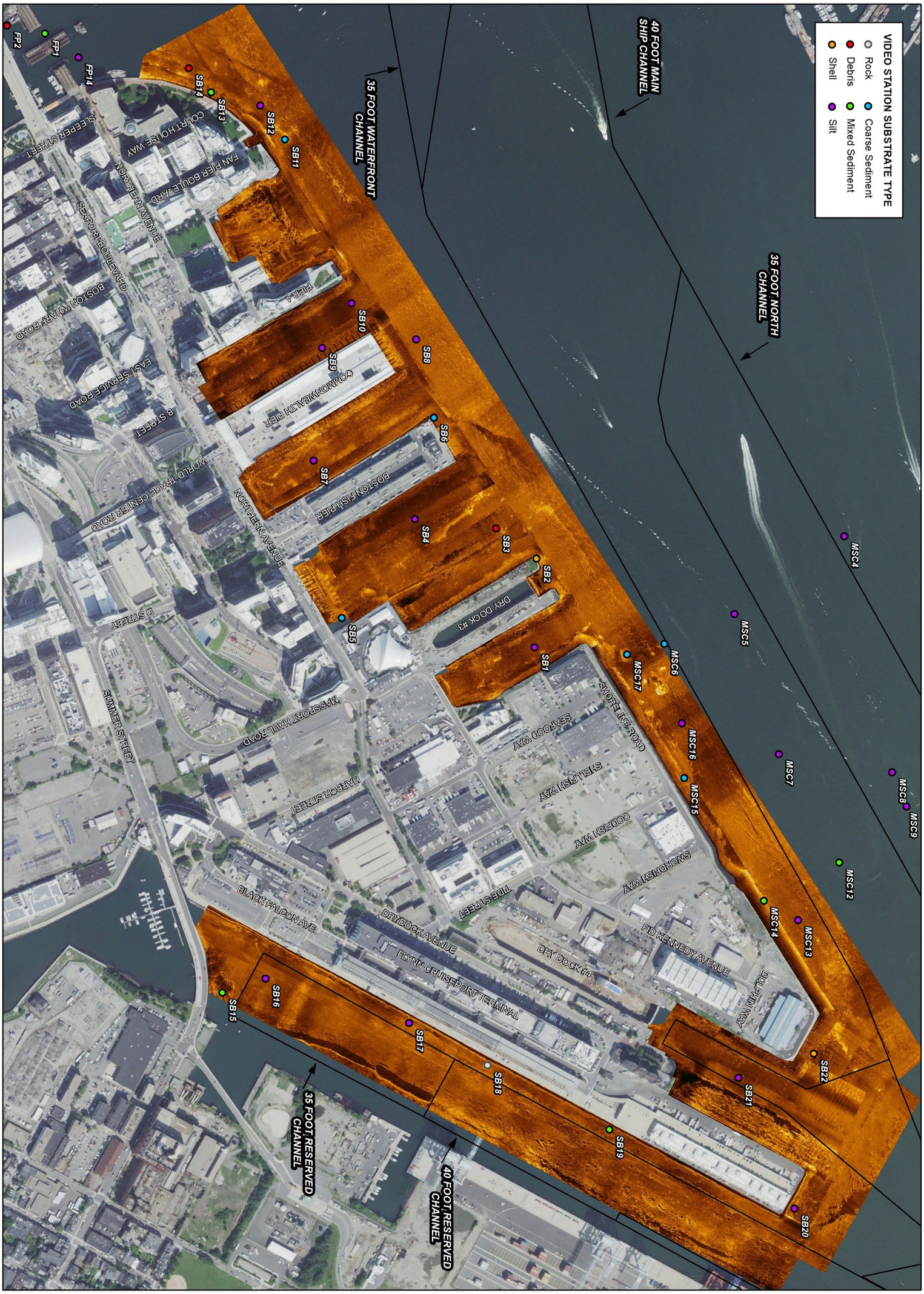

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FIGURE 5:
BOSTON HARBOR, SOUTH BOSTON WATERFRONT
2023 UNDERWATER VIDEO SURVEY

0 500 1,000 1,500 Feet
0 100 200 300 Meters
1:6,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA ALONG WITH OCTOBER 2023 UNDERWATER VIDEO SURVEY STATIONS SYMBOLIZED BY SUBSTRATE TYPE.

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.

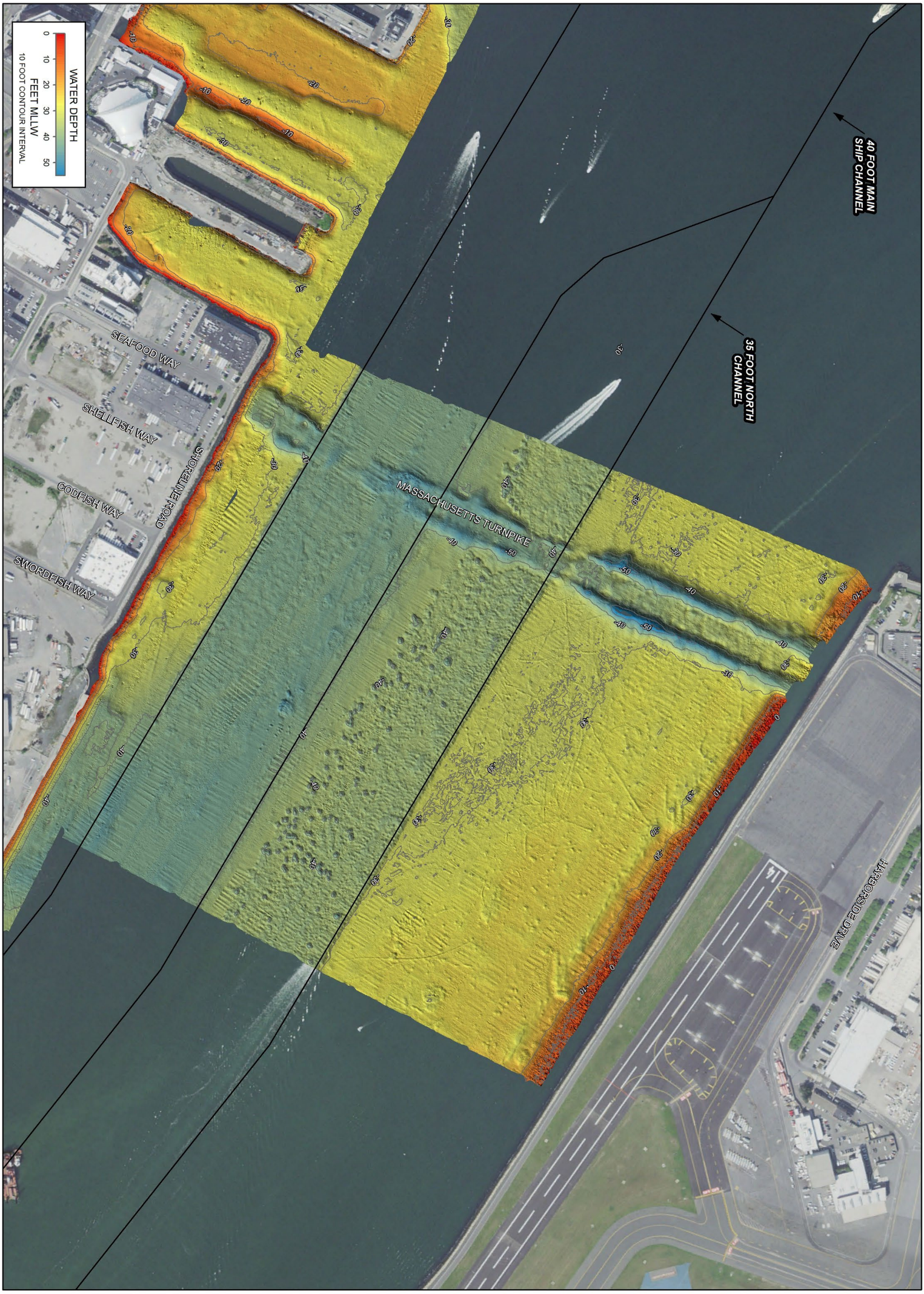
Hydroacoustic Data Interpretation

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-foor 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).



US Army Corps of Engineers
New England District

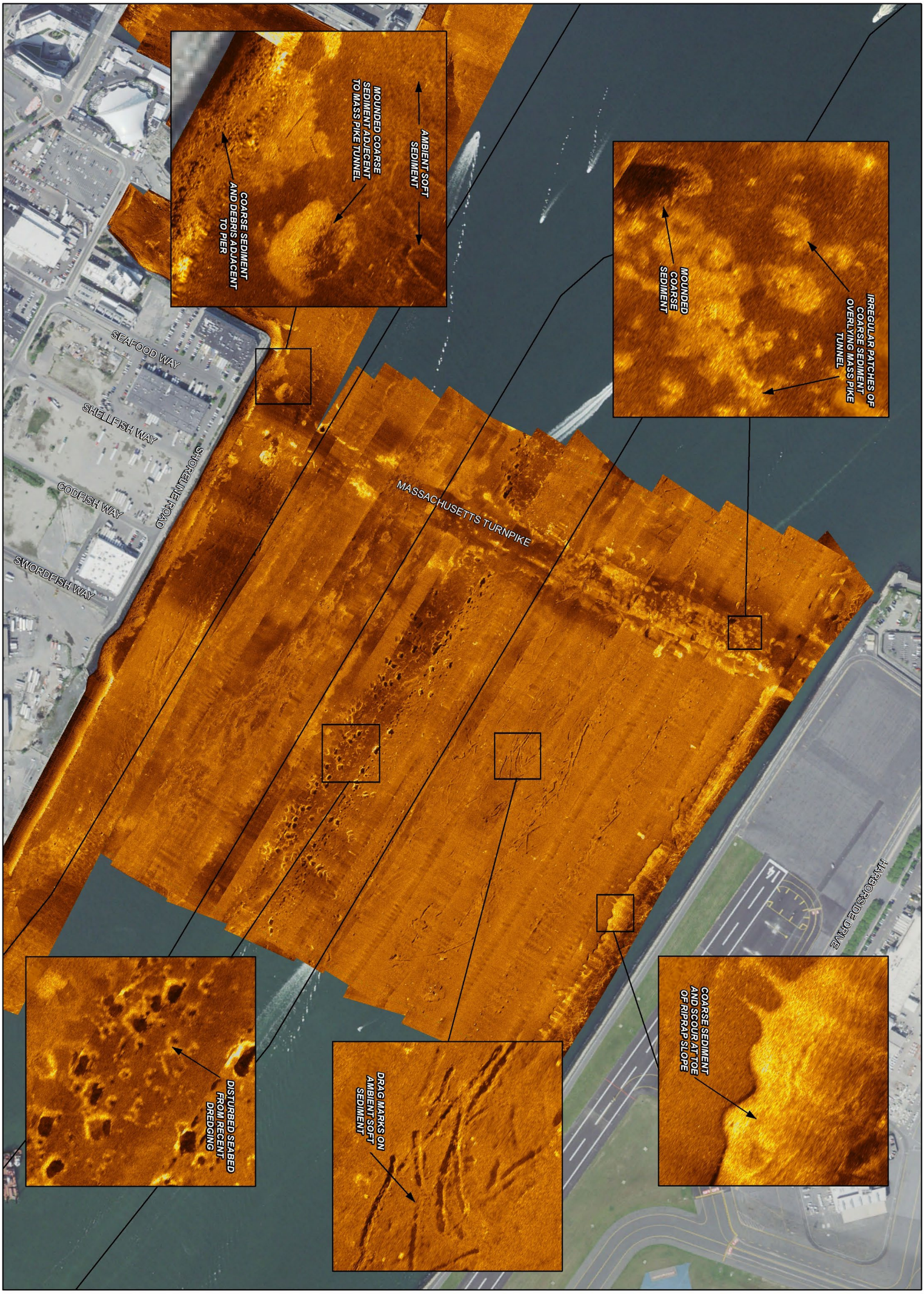
FIGURE 6:
BOSTON HARBOR, SURGE BARRIER
2023 BATHYMETRY

0 250 500 750 1,000 Feet
0 50 100 150 200 250 Meters
1:5,000

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE SOUTH BOSTON WATERFRONT COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

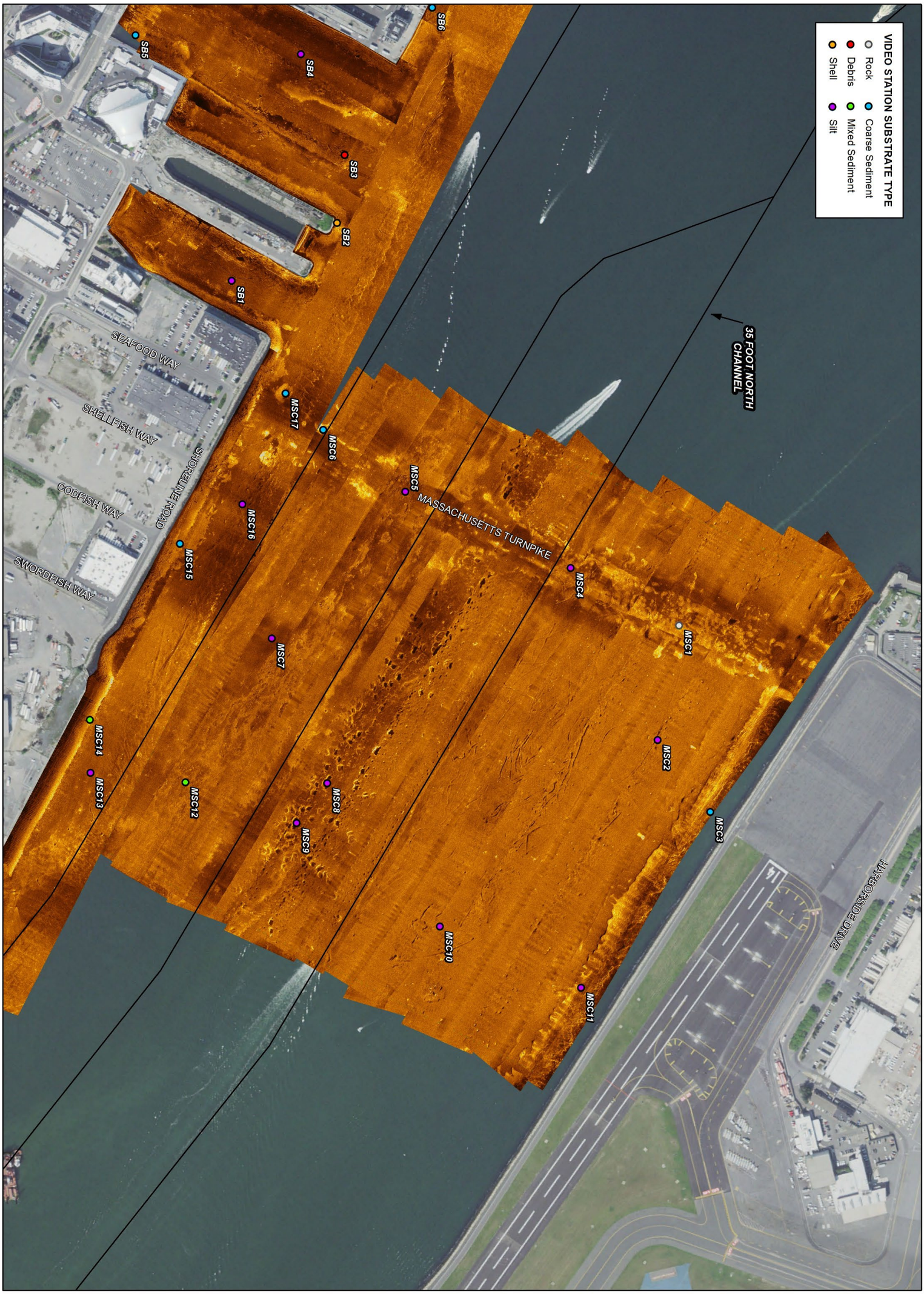
FIGURE 7:
BOSTON HARBOR, SURGE BARRIER
2023 SIDE SCAN SONAR MOSAIC

0 250 500 750 1,000 Feet
0 50 100 150 200 250 Meters
1:5,000

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE SURGE BARRIER COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

FIGURE 8:
BOSTON HARBOR, SURGE BARRIER
2023 UNDERWATER VIDEO SURVEY

0 250 500 750 1,000 Feet
0 50 100 150 200 250 Meters
1:5,000

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA ALONG WITH OCTOBER 2023 UNDERWATER VIDEO SURVEY STATIONS SYMBOLIZED BY SUBSTRATE TYPE.

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 to 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

piping 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., *Styaela clava*, or *Ascidiella 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.

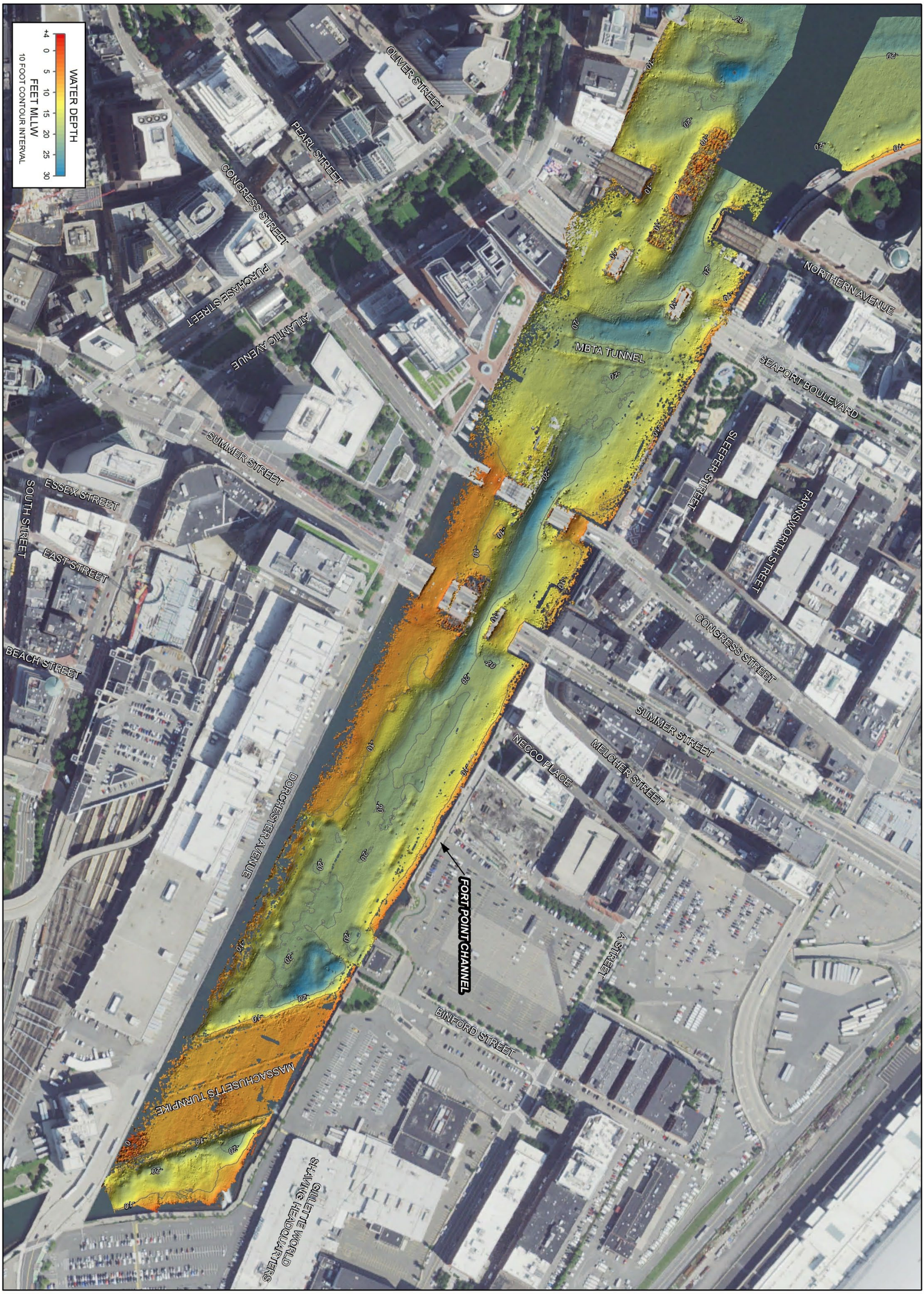


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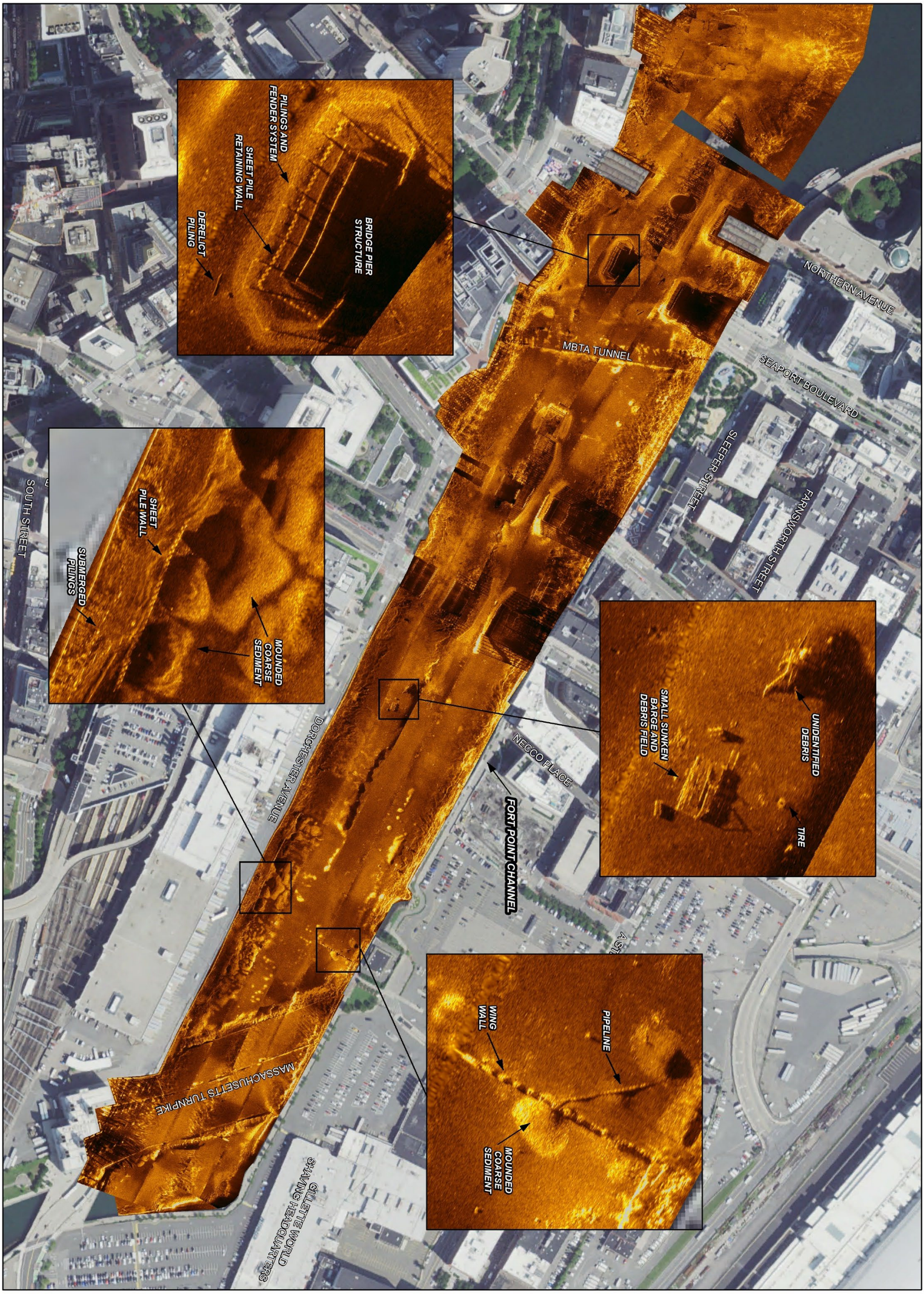
FIGURE 9:
BOSTON HARBOR, FORT POINT CHANNEL
2023 BATHYMETRY

0 250 500 750 Feet
0 50 100 150 Meters
1:3,500

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE FORT POINT CHANNEL COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

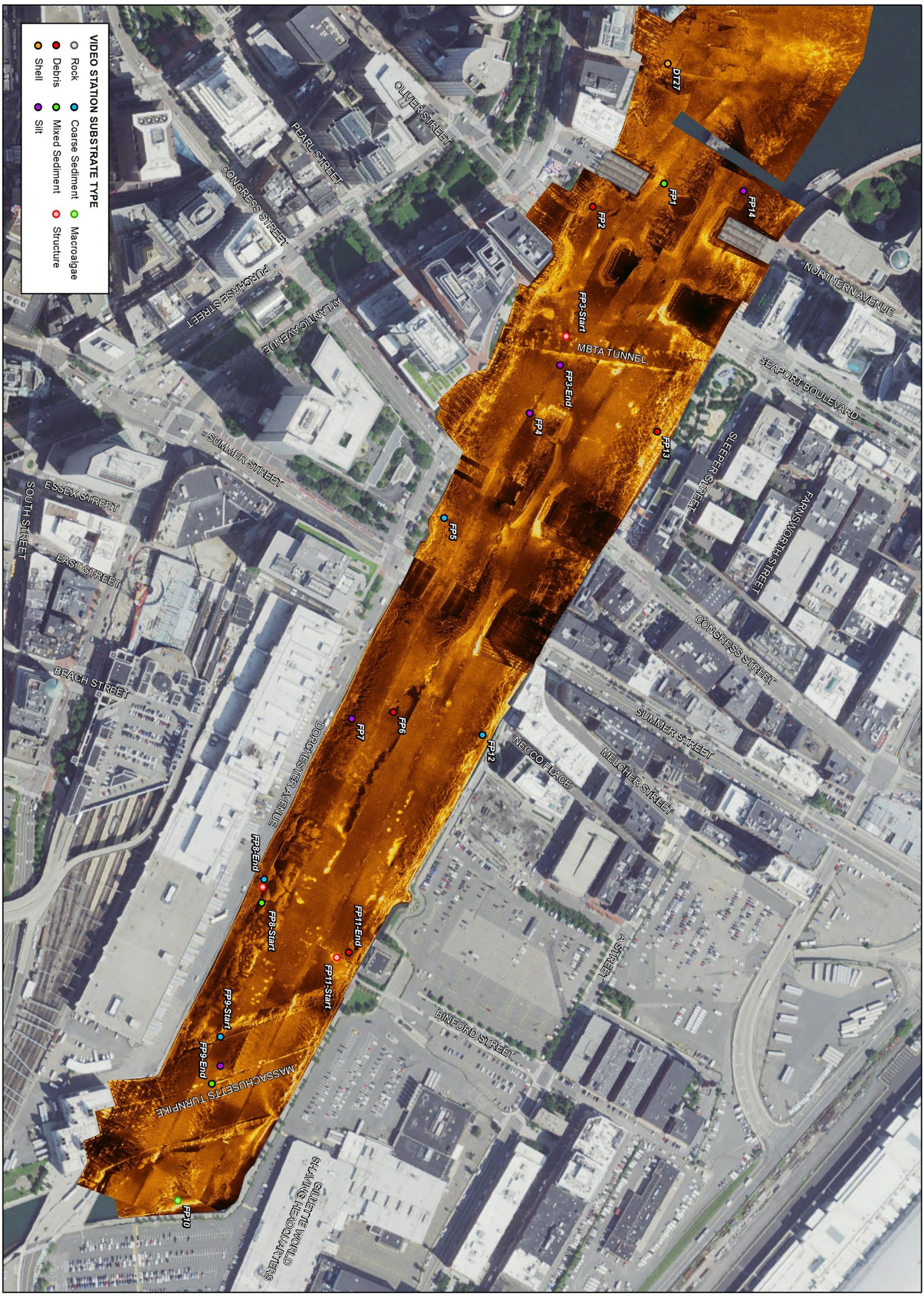
FIGURE 10:
BOSTON HARBOR, FORT POINT CHANNEL
2023 SIDE SCAN SONAR MOSAIC

0 250 500 750 Feet
0 50 100 150 Meters
1:3,500

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE FORT POINT CHANNEL COMPONENT OF THE BOSTON HARBOR CSRM STUDY



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New England District

FIGURE 11:
BOSTON HARBOR, FORT POINT CHANNEL
2023 UNDERWATER VIDEO SURVEY

0 250 500 750 Feet
0 50 100 150 Meters
1:3,500

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA ALONG WITH OCTOBER 2023 UNDERWATER VIDEO SURVEY STATIONS SYMBOLIZED BY SUBSTRATE TYPE.

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 Rowes 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.

US Army Corps of Engineers
New England District

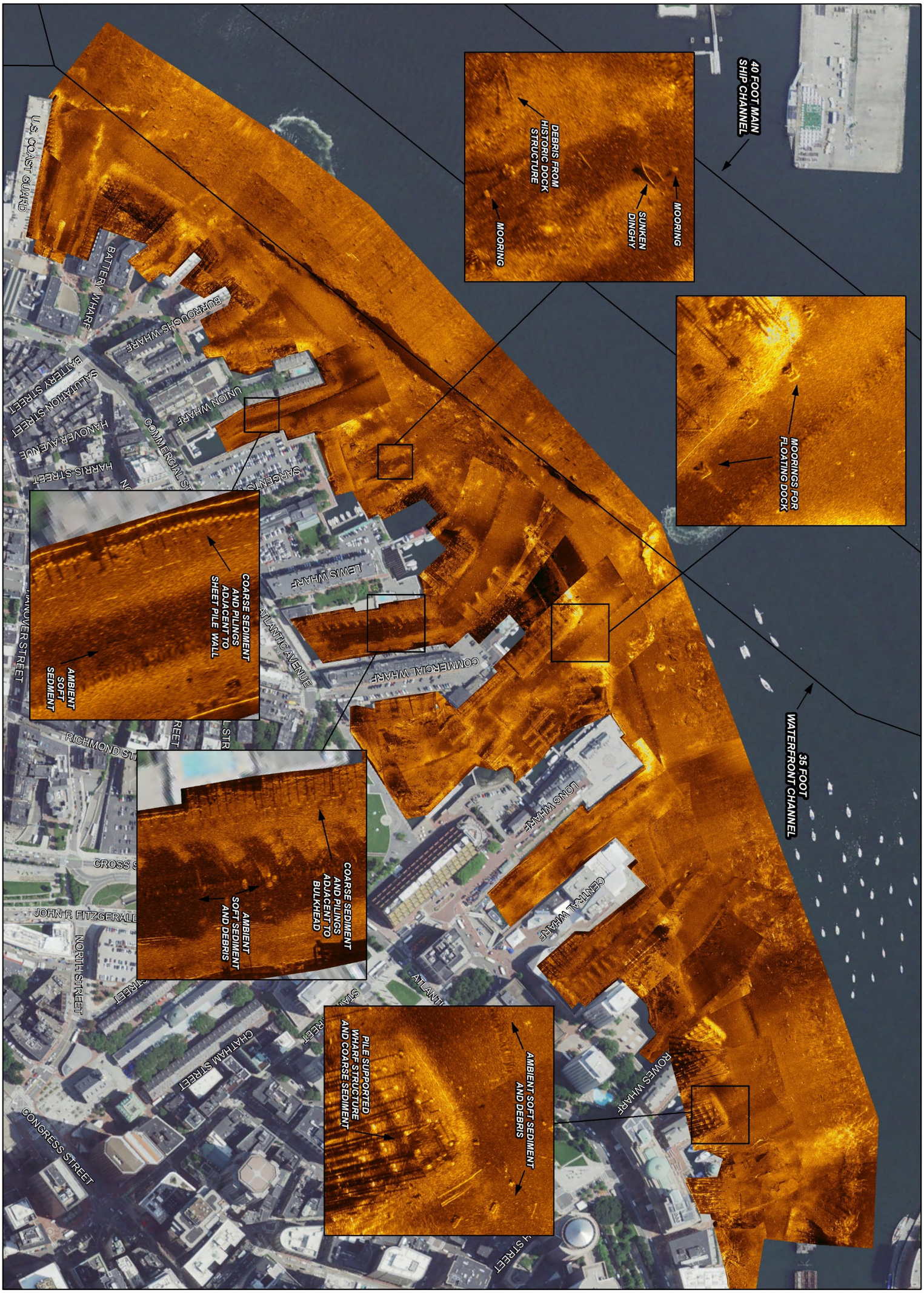
FIGURE 12:
BOSTON HARBOR, DOWNTOWN WATERFRONT
2023 BATHYMETRY

0 250 500 750 Feet
0 50 100 150 Meters
1:4,000

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE DOWNTOWN WATERFRONT COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

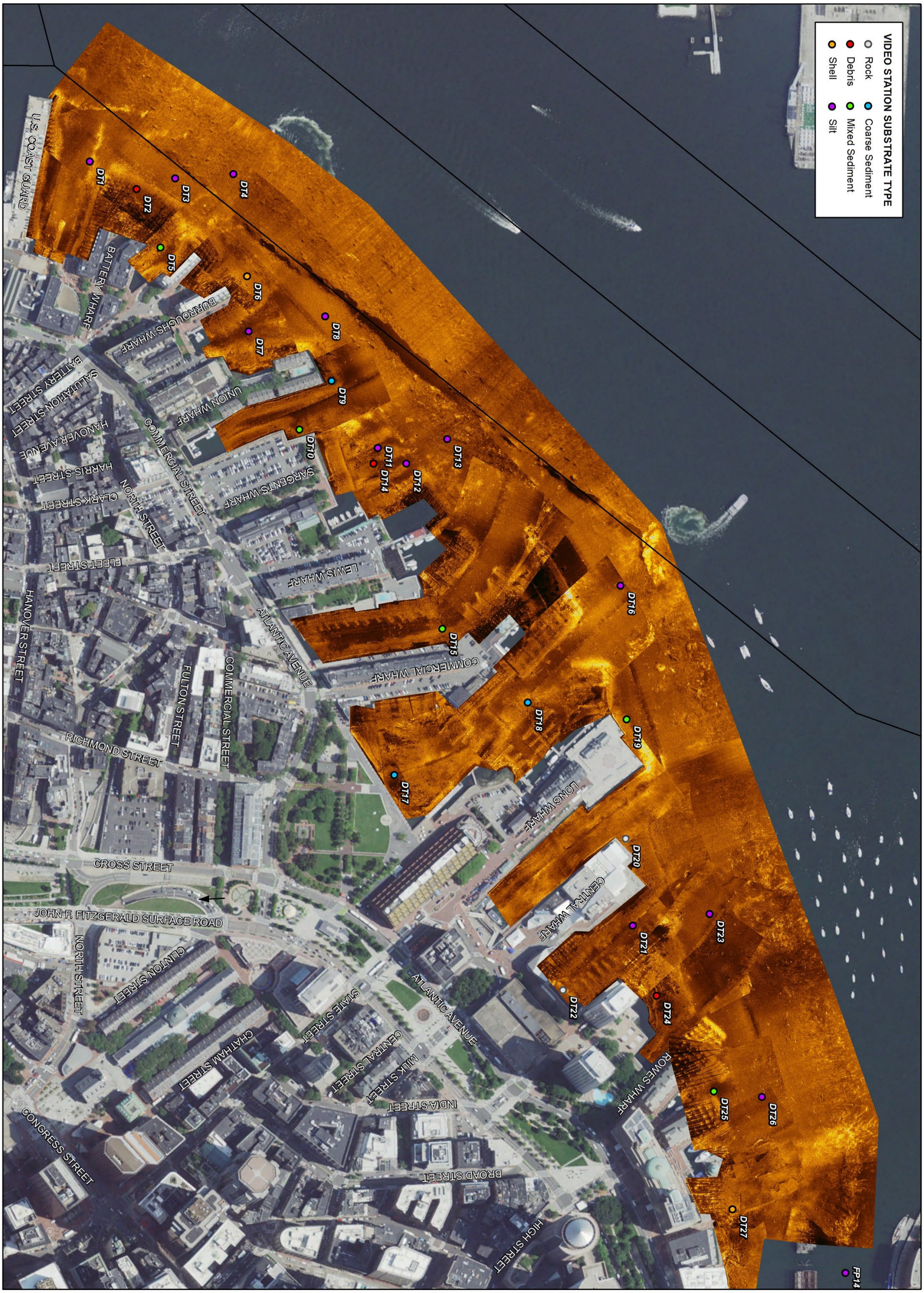
FIGURE 13:
BOSTON HARBOR, DOWNTOWN WATERFRONT
2023 SIDE SCAN SONAR MOSAIC

0 250 500 750 Feet
0 50 100 150 Meters
1:4,000

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE DOWNTOWN WATERFRONT COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

FIGURE 14:
BOSTON HARBOR, DOWNTOWN WATERFRONT
2023 UNDERWATER VIDEO SURVEY

0 250 500 750 Feet
0 50 100 150 Meters
1:4,000

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA ALONG WITH OCTOBER 2023 UNDERWATER VIDEO SURVEY STATIONS SYMBOLIZED BY SUBSTRATE TYPE.

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

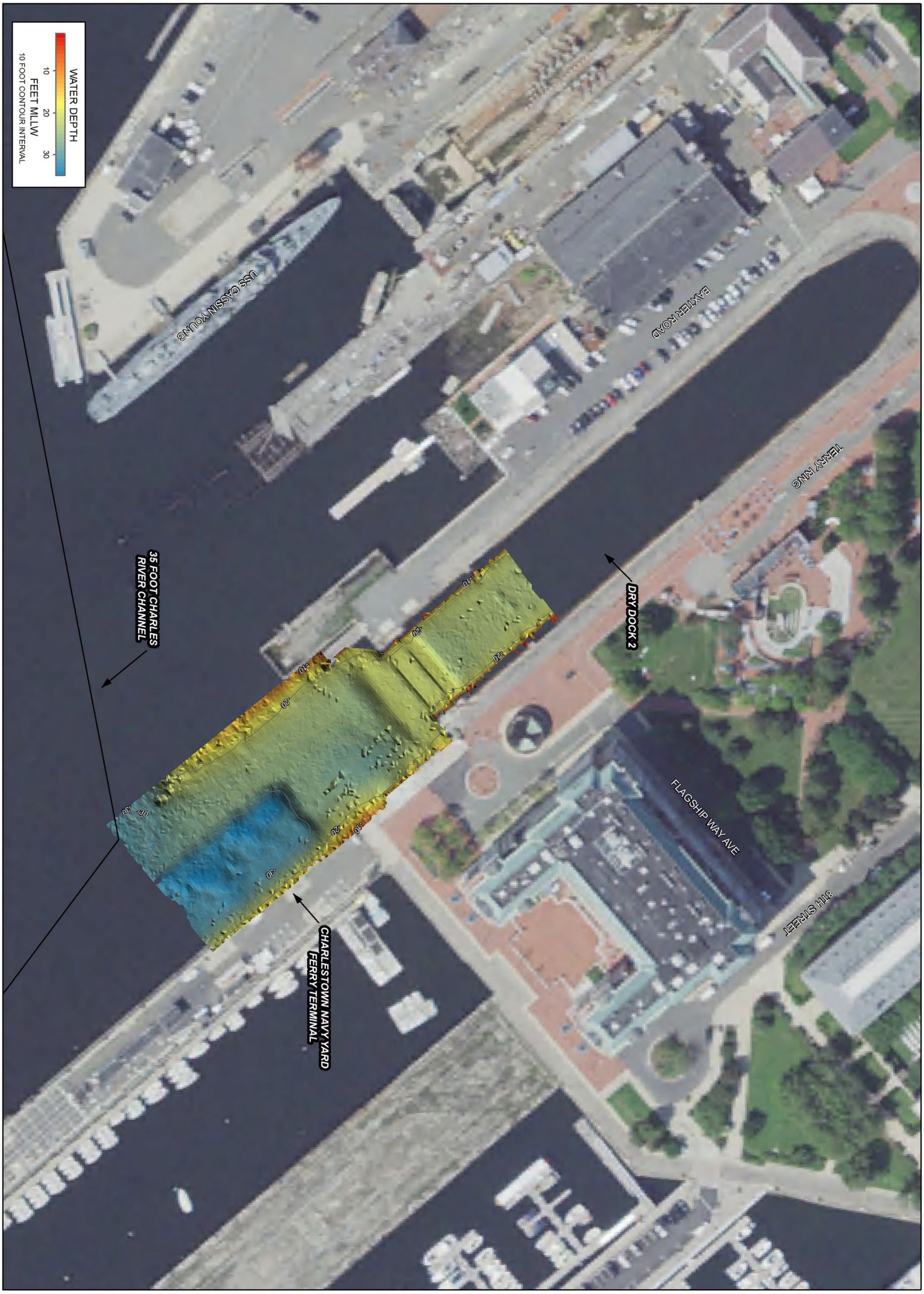
The waterfront in the vicinity of the Charlestown Navy Yard investigation area is heavily developed. Concrete bulkheads, piling supported piers, and the stone structure of Dry Dock 2 border the entire shoreline. The pier of the Charlestown Navy Yard Ferry Terminal is located along the north side of the 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.



US Army Corps of Engineers
New England District

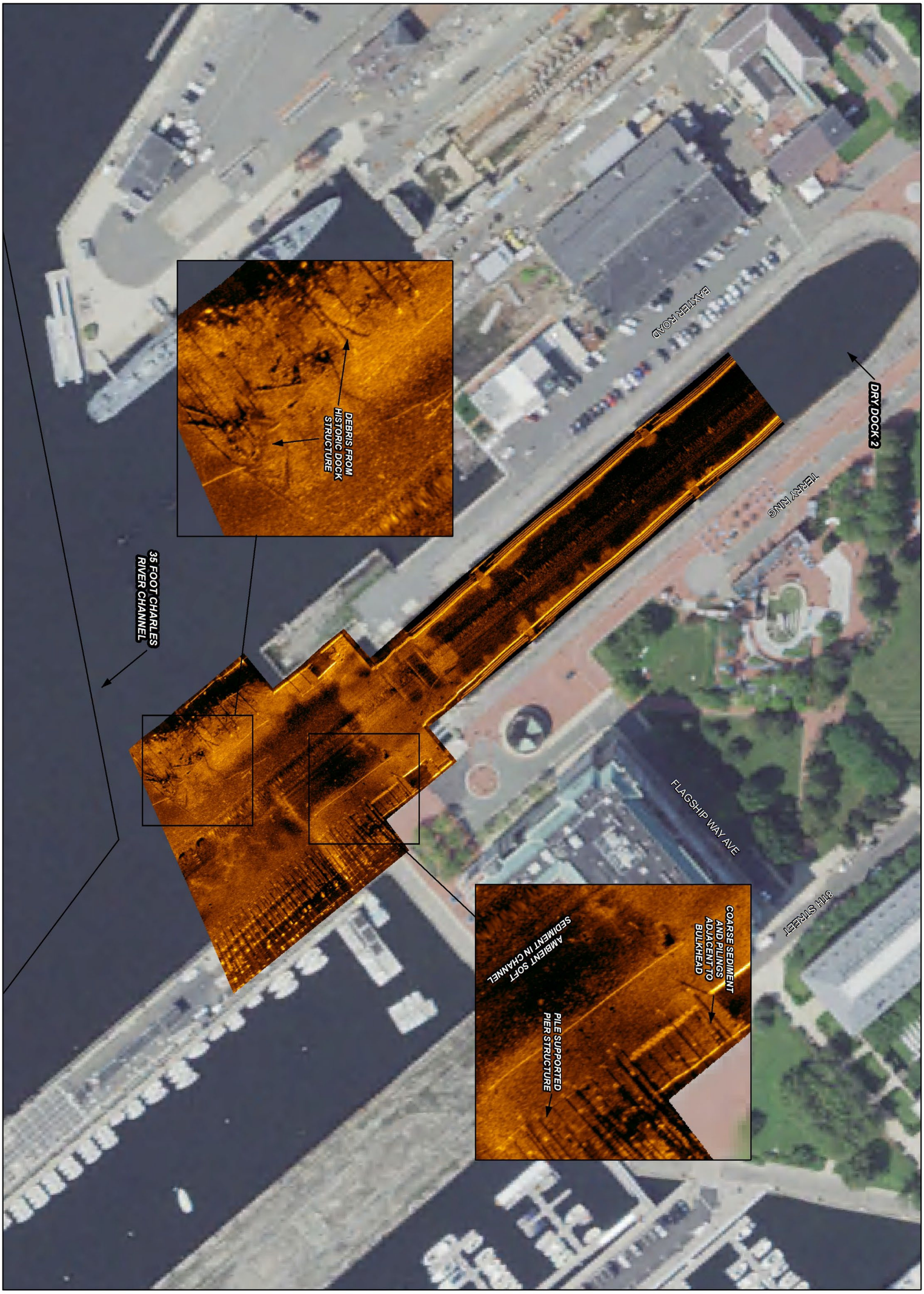
FIGURE 15:
BOSTON HARBOR, CHARLESTOWN NAVY YARD
2023 BATHYMETRY

0 100 200 300 Feet
0 25 50 75 Meters
1:1,250

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE CHARLESTOWN NAVY YARD COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

FIGURE 16:
BOSTON HARBOR, CHARLESTOWN NAVY YARD
2023 SIDE SCAN SONAR MOSAIC

0 100 200 300 Feet
0 25 50 75 Meters
1:1,250

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE CHARLESTOWN NAVY YARD COMPONENT OF THE BOSTON HARBOR CSRM STUDY

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.

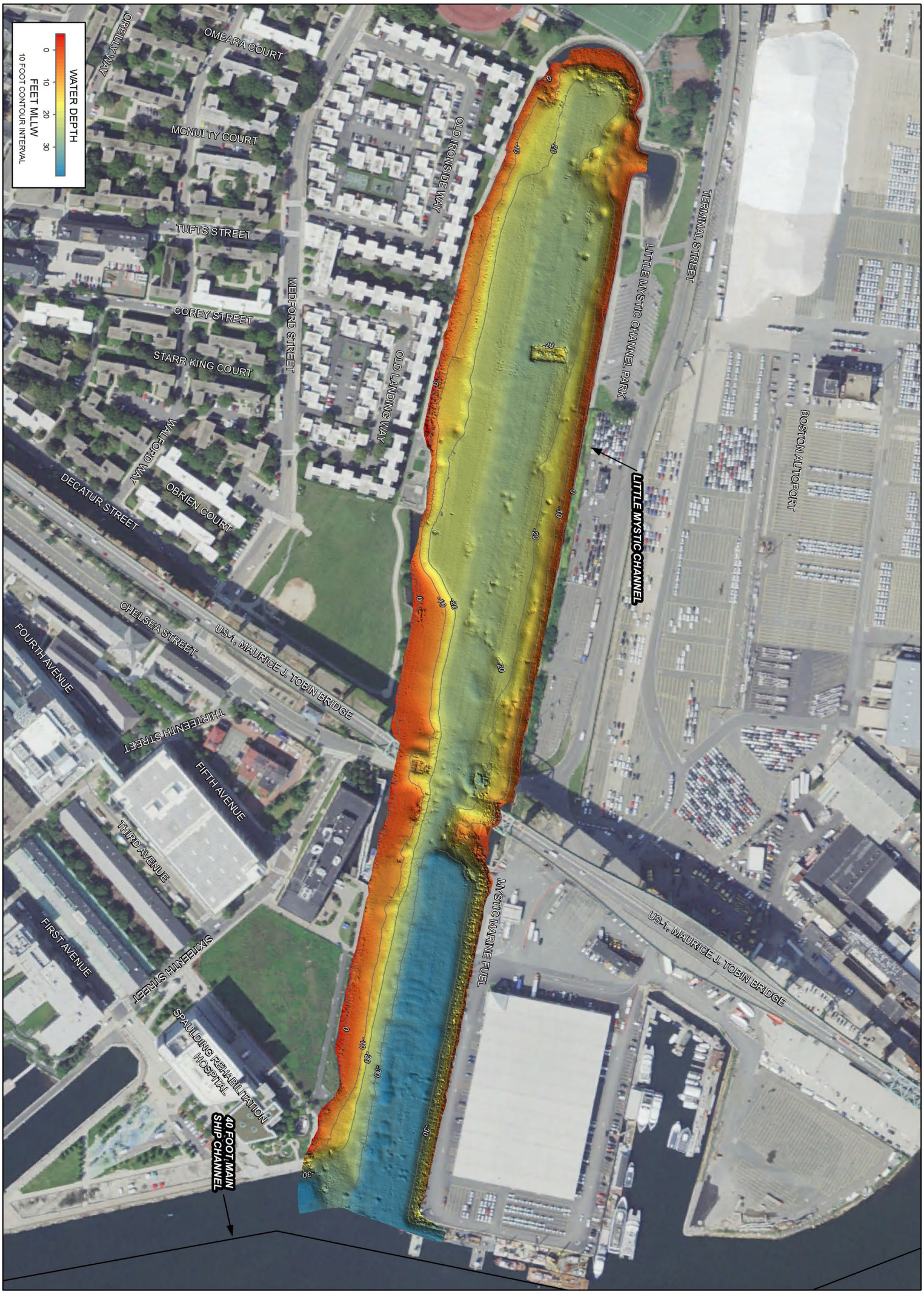
Interpretation of side scan sonar data documented areas of coarse sediment and debris immediately adjacent to the shoreline and along anthropogenic structures within the waterway, transitioning to

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*).



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New England District

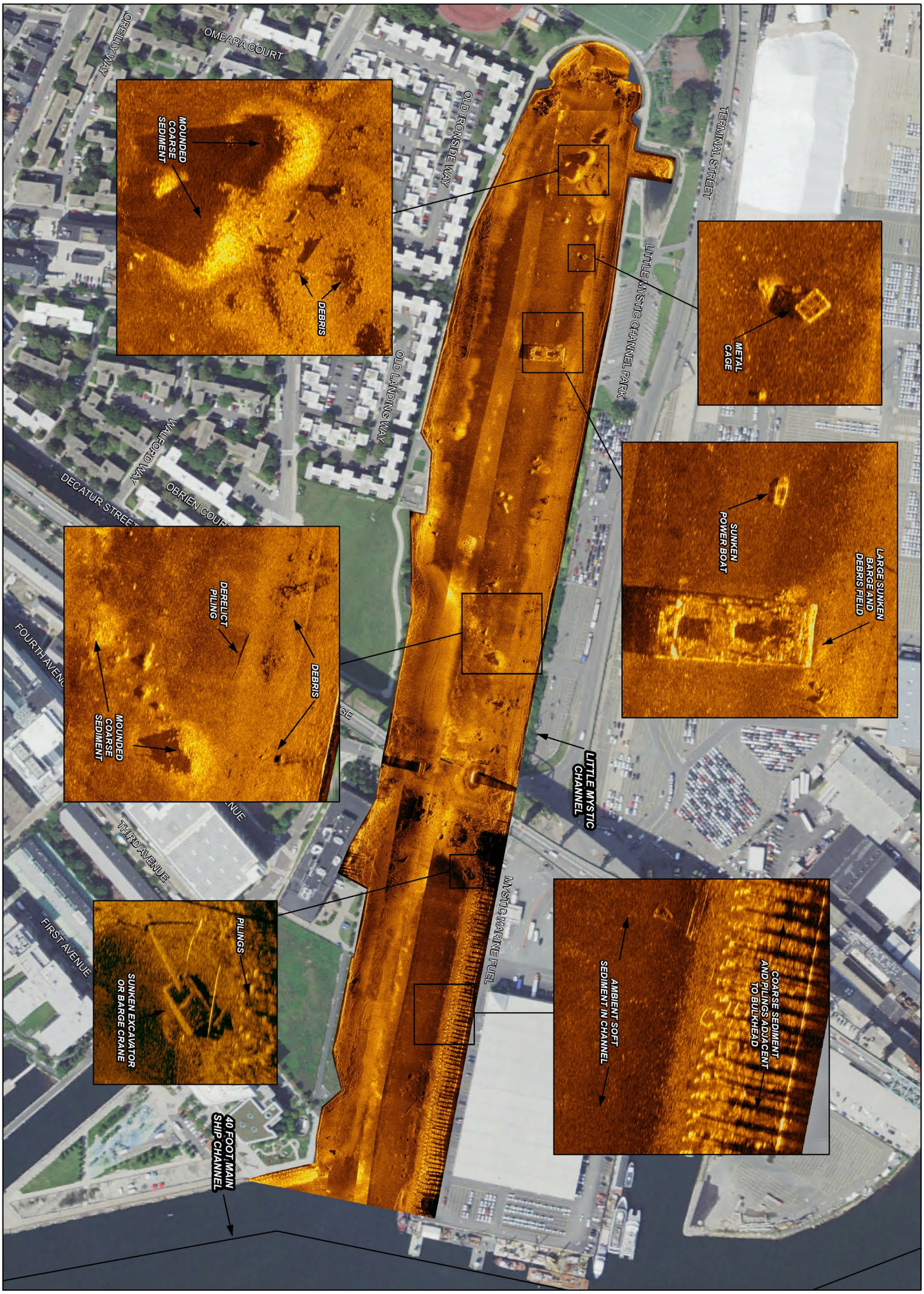
FIGURE 17:
BOSTON HARBOR, LITTLE MYSTIC CHANNEL
2023 BATHYMETRY

0 250 500 Feet
0 25 50 75 100 Meters
1:2,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE LITTLE MYSTIC CHANNEL COMPONENT OF THE BOSTON HARBOR CSRM STUDY



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New England District

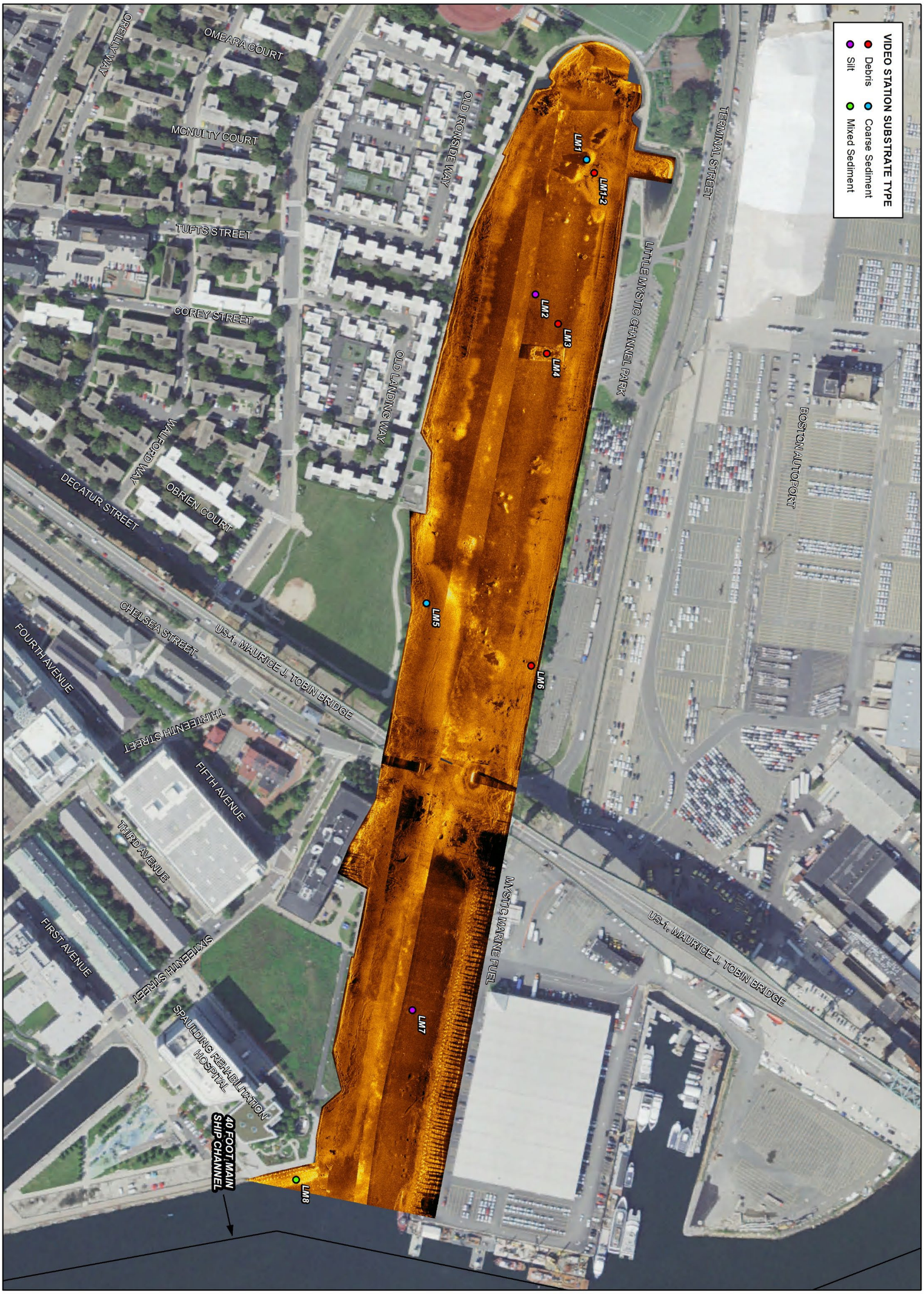
FIGURE 18:
BOSTON HARBOR, LITTLE MYSTIC CHANNEL
2023 SIDE SCAN SONAR MOSAIC

0 250 500 Feet
0 25 50 75 100 Meters
1:2,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE LITTLE MYSTIC CHANNEL COMPONENT OF THE BOSTON HARBOR CSRM STUDY



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New England District

FIGURE 19:
BOSTON HARBOR, LITTLE MYSTIC CHANNEL
2023 UNDERWATER VIDEO SURVEY

0 250 500 Feet
0 25 50 75 100 Meters
1:2,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA ALONG WITH OCTOBER 2023 UNDERWATER VIDEO SURVEY STATIONS SYMBOLIZED BY SUBSTRATE TYPE.

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.

US Army Corps of Engineers
New England District

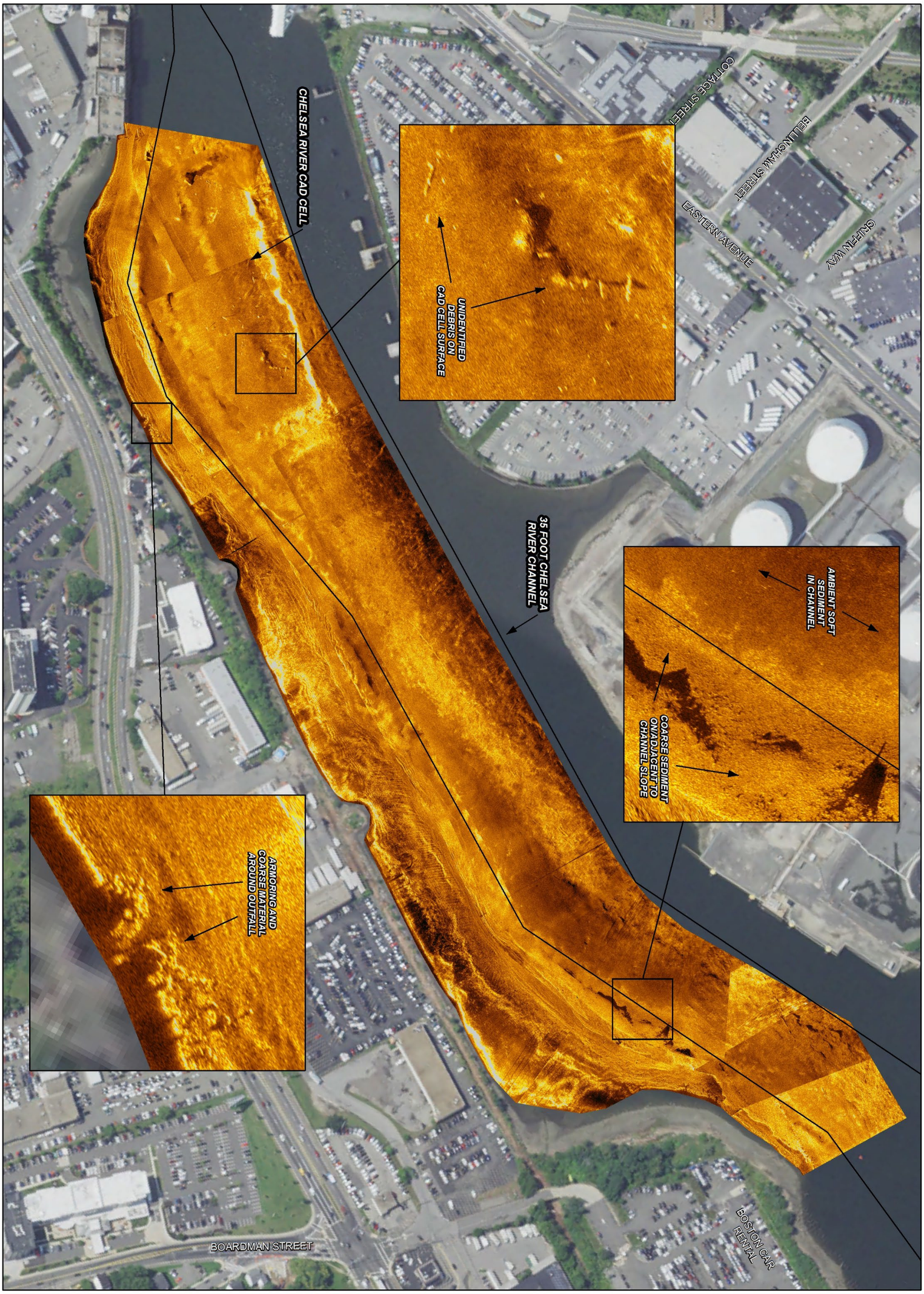
FIGURE 20:
BOSTON HARBOR, CHELSEA RIVER
2023 BATHYMETRY

0 100 200 300 400 500 Feet
0 25 50 75 100 Meters
1:2,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE CHELSEA RIVER CHANNEL COMPONENT OF THE BOSTON HARBOR CSRM STUDY



US Army Corps of Engineers
New England District

FIGURE 21:
BOSTON HARBOR, CHELSEA RIVER
2023 SIDE SCAN SONAR MOSAIC

0 100 200 300 400 500 Feet
0 25 50 75 100 Meters
1:2,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE CHELSEA RIVER COMPONENT OF THE BOSTON HARBOR CSRM STUDY

US Army Corps of Engineers
New England District

FIGURE 22:
BOSTON HARBOR, CHELSEA RIVER
2023 UNDERWATER VIDEO SURVEY

0 100 200 300 400 500 Feet
0 25 50 75 100 Meters
1:2,750

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA ALONG WITH OCTOBER 2023 UNDERWATER VIDEO SURVEY STATIONS SYMBOLIZED BY SUBSTRATE TYPE.

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.

US Army Corps of Engineers
New England District

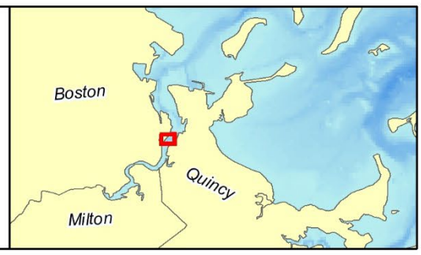
FIGURE 23:
NEPONSET RIVER
2023 BATHYMETRY

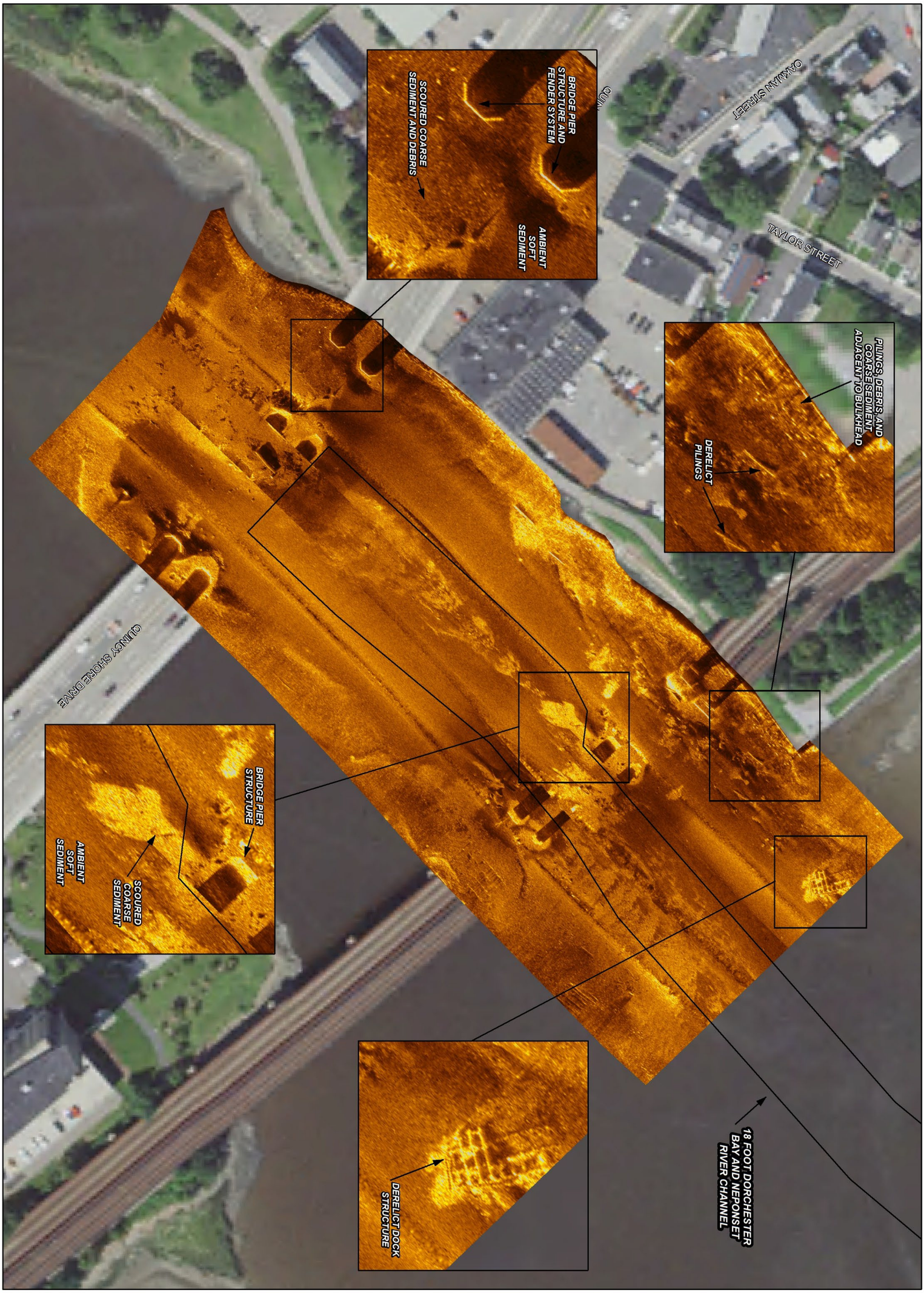
0 50 100 150 200 250 Feet
0 10 20 30 40 50 Meters
1:1,250

2021 NAIP AERIAL IMAGERY

GCS NAD1983

THIS FIGURE DEPICTS BATHYMETRY FROM AUGUST 2023 HYDROACOUSTIC SURVEYS CONDUCTED BY USACE TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE NEPONSET RIVER COMPONENT OF THE BOSTON HARBOR CSRM STUDY





US Army Corps
of Engineers
New England District

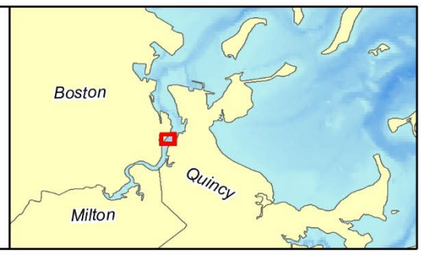
FIGURE 24:
NEPONSET RIVER
2023 SIDE SCAN SONAR MOSAIC

0 50 100 150 200 250 Feet
0 10 20 30 40 50 Meters
1:1,250

2021 NAIP AERIAL IMAGERY

GCS NAD1983

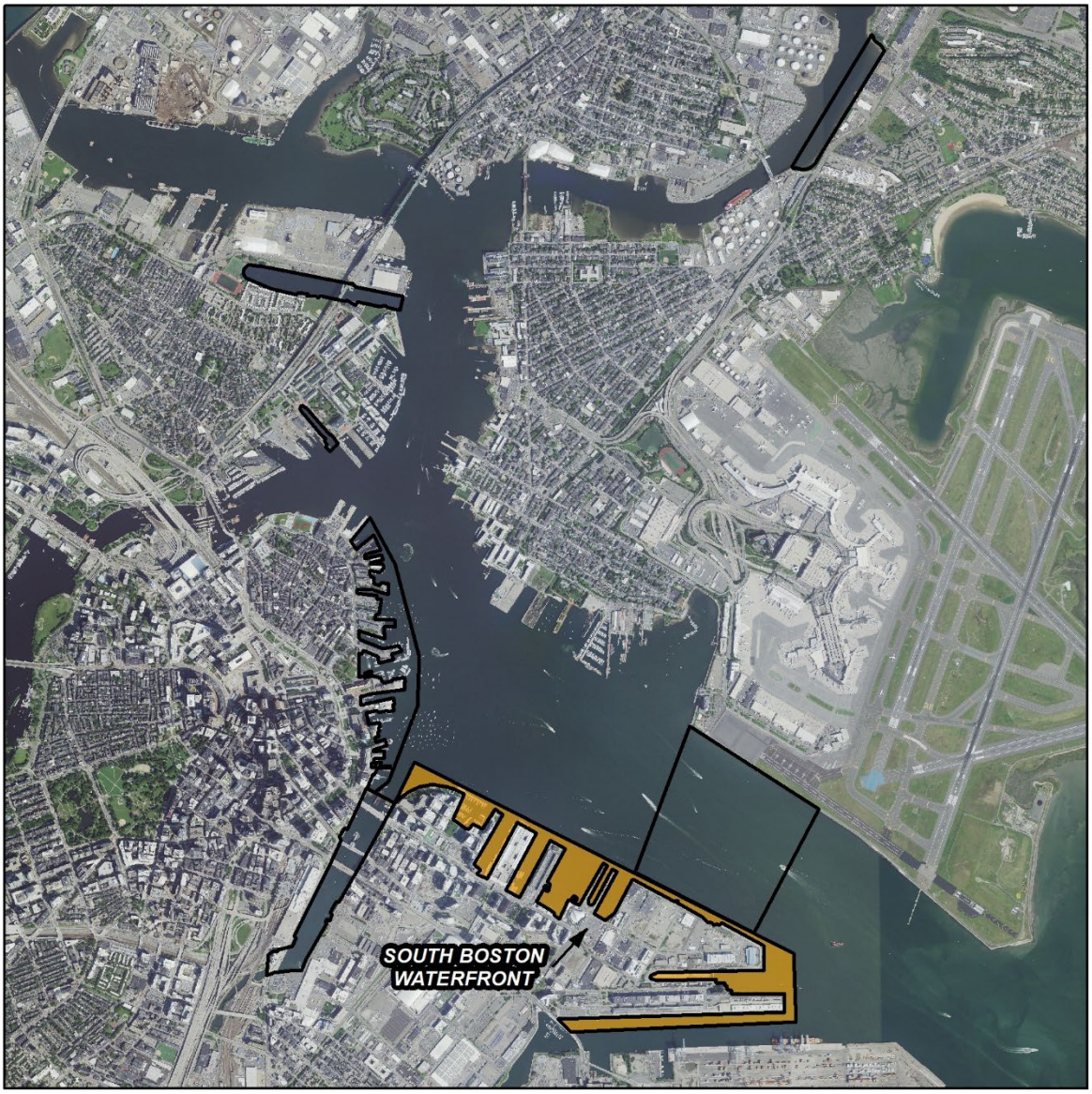
THIS FIGURE DEPICTS THE SIDE SCAN SONAR MOSAIC CREATED FROM AUGUST 2023 HYDROACOUSTIC SURVEY DATA TO DOCUMENT SEABED CONDITIONS AND FEATURES OF INTEREST WITHIN THE NEPONSET RIVER COMPONENT OF THE BOSTON HARBOR CSRM STUDY



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*

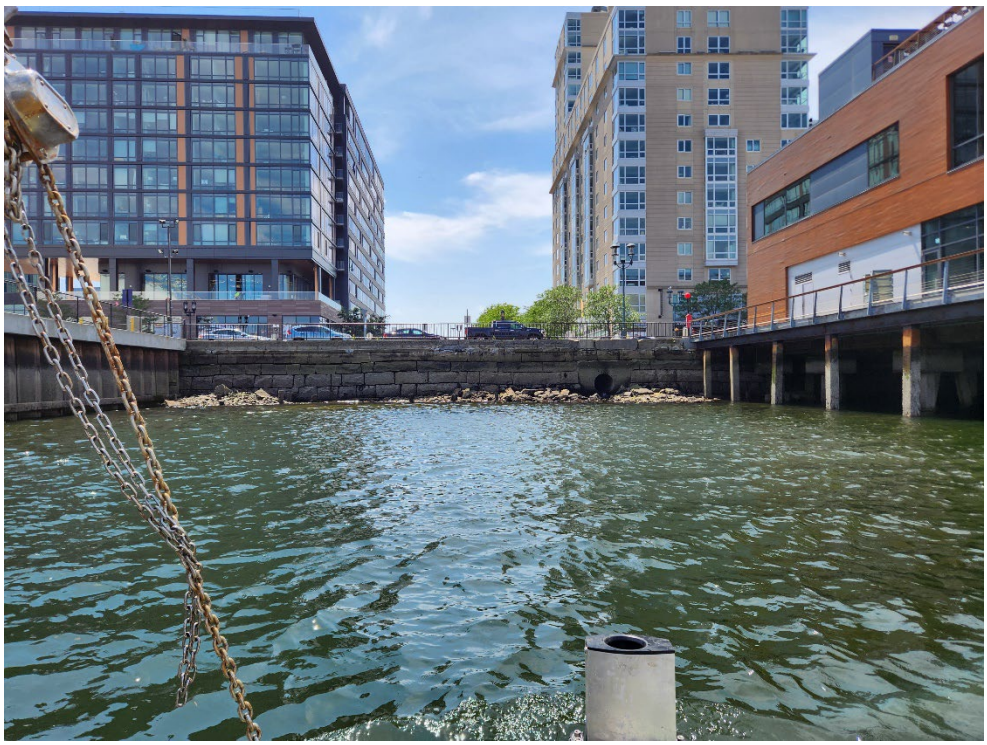
Survey Area:	***South Boston Waterfront***	Date: *8/9/2023*

Image	Description
	- *Northern end of channel between Legal Sea Foods HQ and Dry Dock II* - *Steel, wooden bulkheads, wooden pilings* - *Algae*
	- *Northern side of channel between Legal Sea Foods HQ and Dry Dock II* - *Wooden bulkhead, wood pilings, concrete slabbing* - *Algae, barnacles*

Survey Area:	***South Boston Waterfront***	Date: *8/9/2023*

Image	Description
	- *Channel between Dry Dock II and Fish Pier* - *Steel bulkhead, wood pilings, concrete/rebar slabbing* - *Algae, barnacles*
	- *End of channel between Dry Dock II and Fish Pier* - *Stone seawall/ retaining wall* - *Algae and macroalgae*

Survey Area:	***South Boston Waterfront***	Date: *8/9/2023*

Image	Description
	- *End of channel between Dry Dock II and Fish Pier* - *Steel bulkhead* - *Stone seawall amd rock piles* - *Drainage pipes* - *Concrete pilings*
	- *Channel between Dry Dock II and Fish Pier facing the Fish Pier* - *Stone seawall* - *Algae and macroalgae*

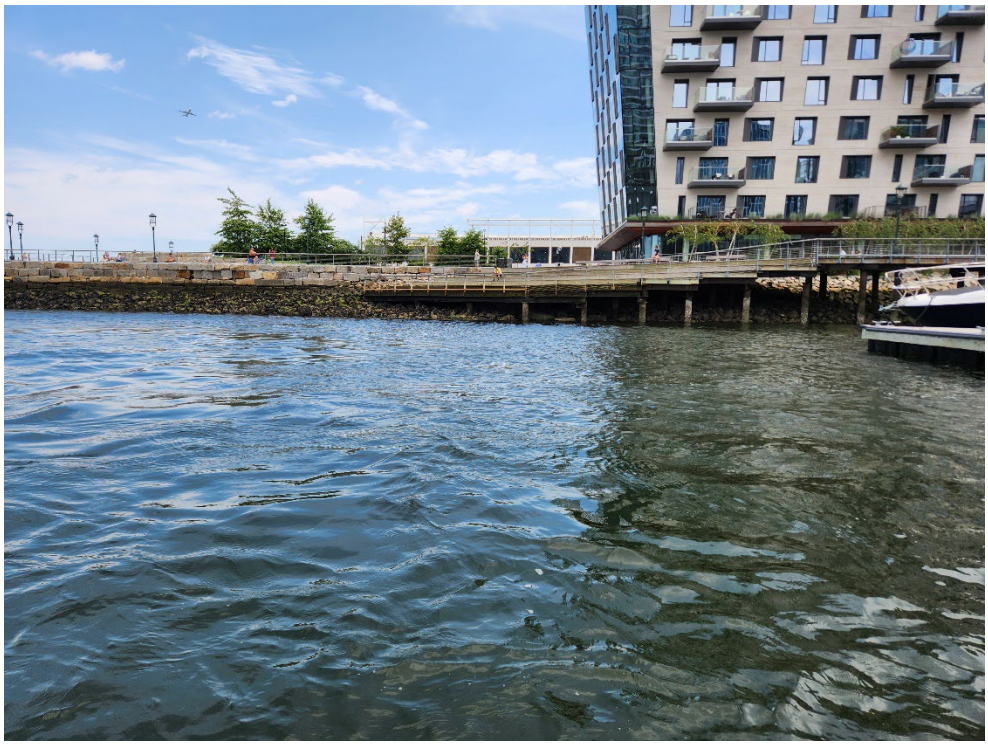
Survey Area:	***South Boston Waterfront***	Date: *8/9/2023*

Image	Description
	- *Channel between Fish Pier and Commonwealth Pier* - *Concrete, steel pilings*
	- *End of channel between Fish Pier and Commonwealth Pier* - *Stone seawall* - *drainage pipes* - *Algae, macroalgfae, and barnacles*

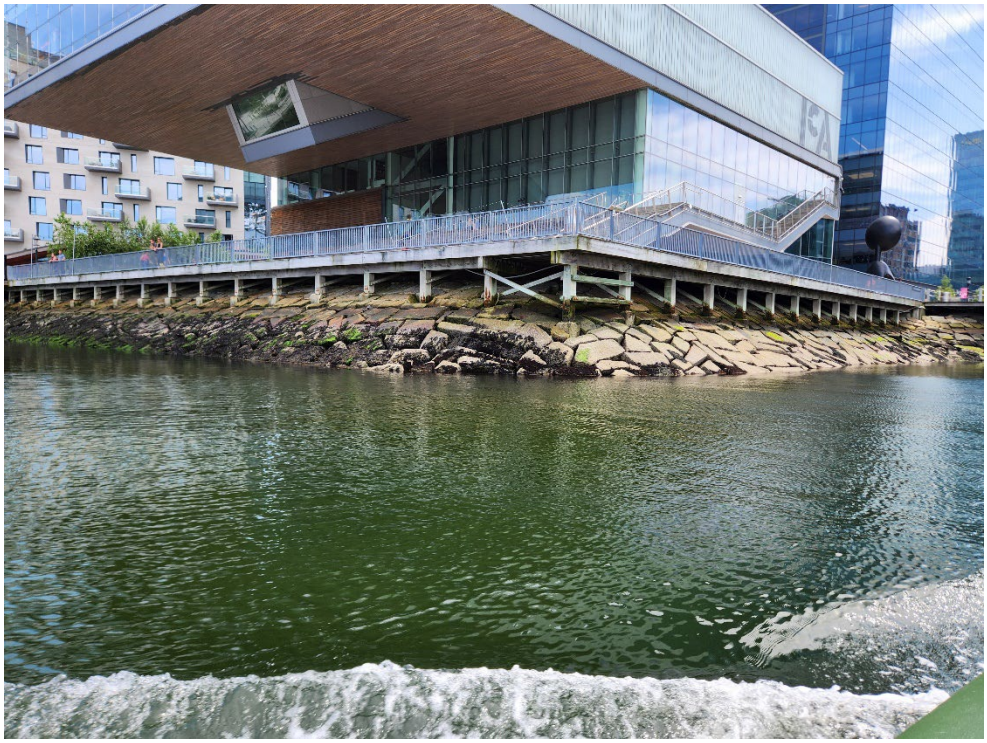
Survey Area:	***South Boston Waterfront***	Date: *8/9/2023*

Image	Description
	- *Channel between Fish Pier and Commonwealth Pier facing the Fish Pier* - *Stone seawall/ bulkhead*
	- *Channel Commonwealth Pier and Pier 4, facing Pier 4* - *Stone seawall* - *Algae, marcoalgae, and barnacles*

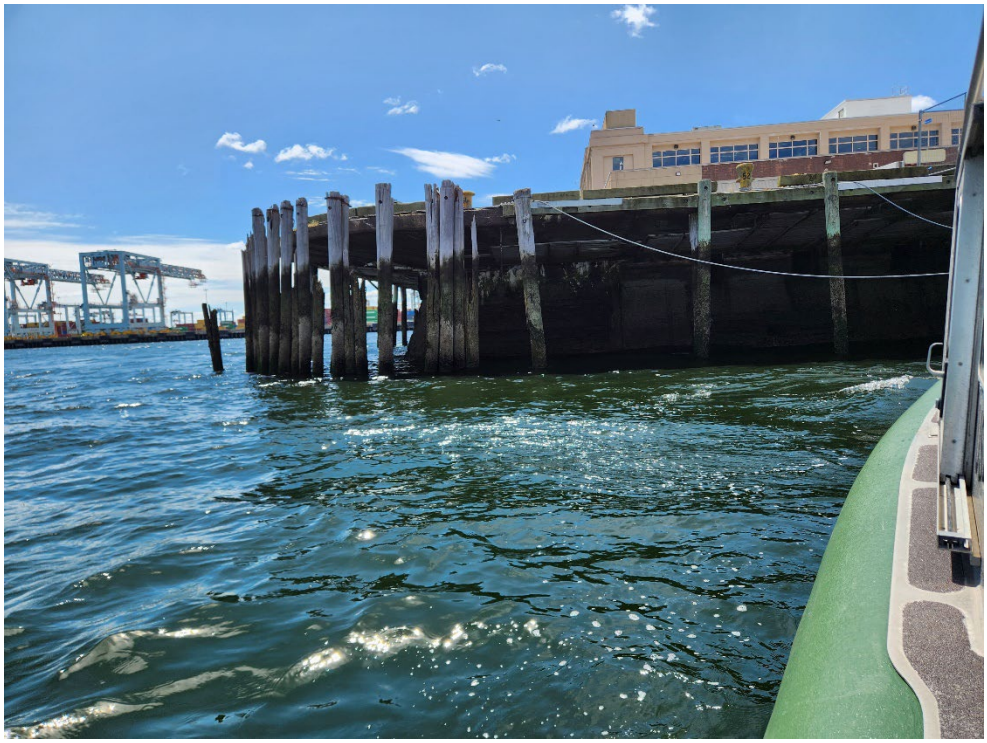
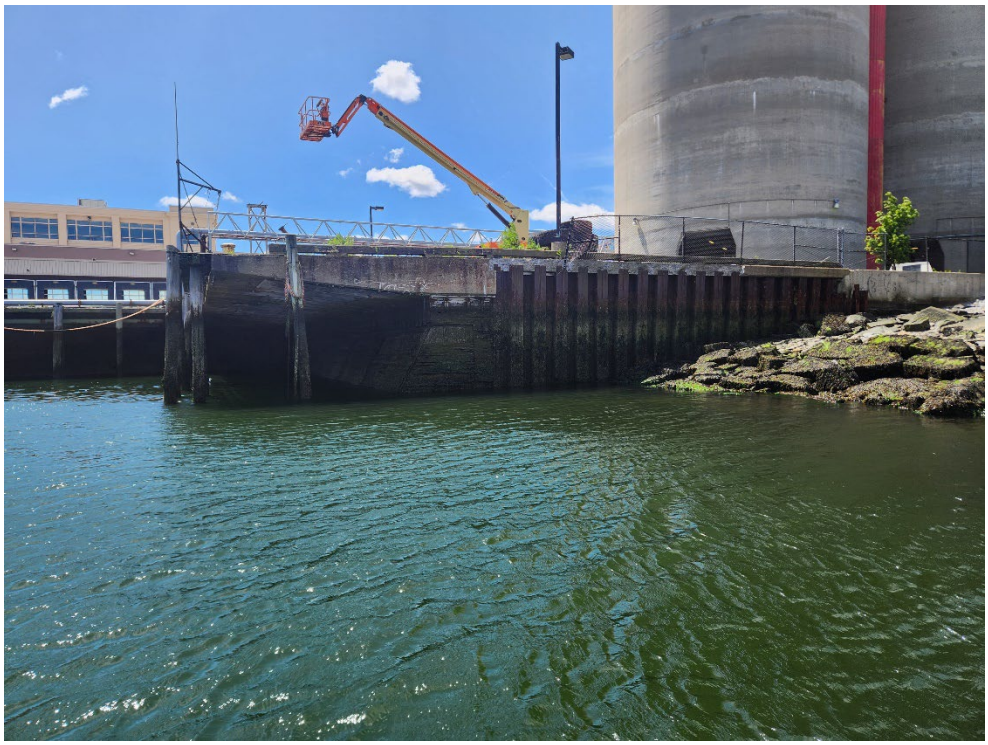
Survey Area:	***South Boston Waterfront***	Date: *8/9/2023*

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:	***South Boston Waterfront***	Date:	*8/9/2023*

Image	Description
	- *Fan Pier marina, Institute of Contemporary Art* - *Stone reventment with wood deck supports* - *Algae and macroalgae*
	- *Northern side of Fan Pier marina* - *Steel bulkhead and pilings* - *Floating docks*

Survey Area:	***South Boston Waterfront – Dry Dock***	Date: *8/9/2023*

Image	Description
	- *Southern side of Boston Dry Dock III Channel* - *Wood pilings and bulkhead*
	- *End of Boston Dry Dock III Channel* - *Steel and wooden bulkheads* - *Wood pilings, concrete supports* - *Stone rip-rap* - *Algae and macroalgae*

Survey Area:	***South Boston Waterfront – Dry Dock***	Date: *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:	***South Boston Waterfront – Dry Dock***	Date: *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*

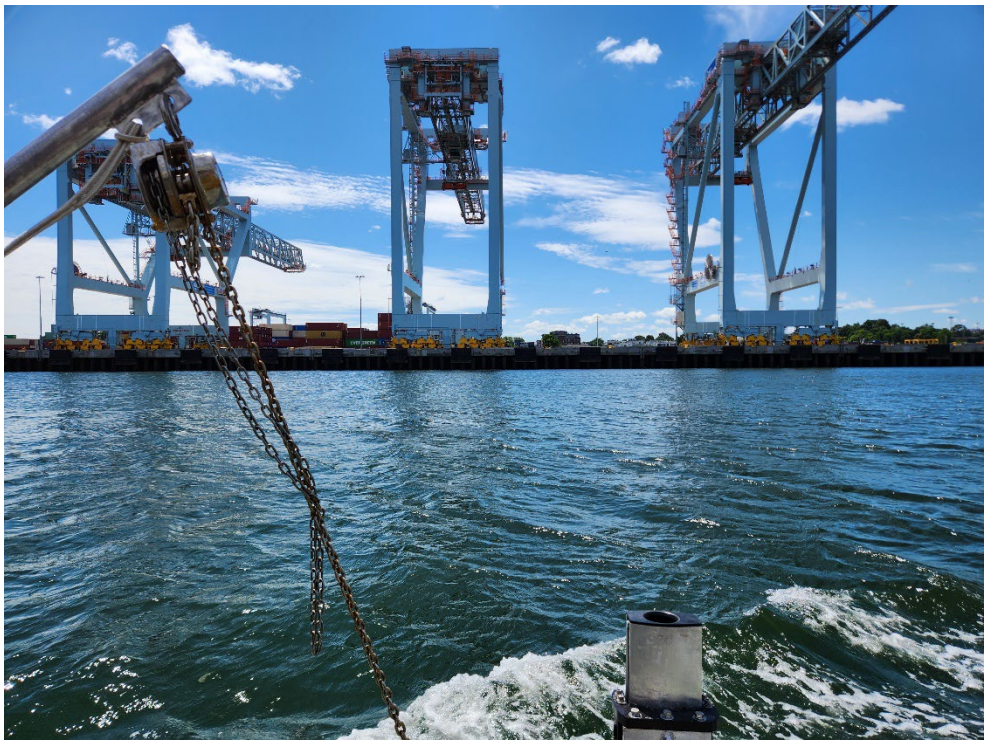
Survey Area:	***South Boston Waterfront – Dry Dock / Reserved Channel***	Date:	*8/9/2023*

Image	Description
	- *Northern side of Boston Dry Dock III Channel* - *Decomposing concrete pilings, bulkhead, blocks, and slabs* - *Wood and steel pilings* - *Stone slabs* - *Crumbling concrete landing* - *Upland vegetation* - *Barnacles, algae*
	- *Reserved Channel entrance facing the northern shoreline* - *Wood/concrete pilings* - *Algae, macroalgae, and barnacles*

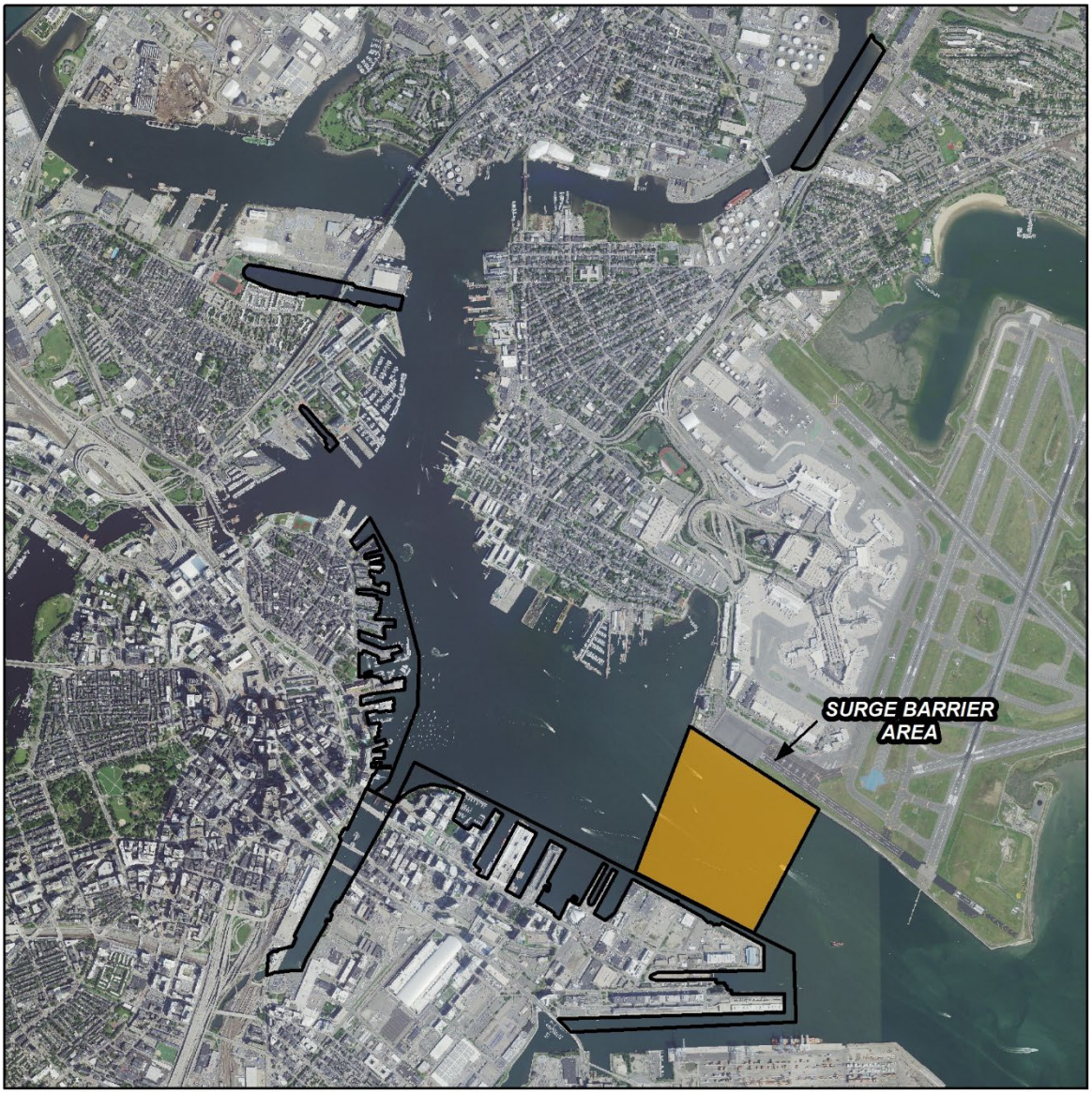
Survey Area:	***South Boston Waterfront – Reserved Channel***	Date: *8/9/2023*

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:	***Boston Harbor Surge Barrier***	Date: *8/10/2023*

Image	Description
	- *Logan Airport southern shoreline* - *Stone seawall* - *Algae and macroalgae*
	- *Logan Airport southern shoreline* - *Stone seawall* - *Approach Light Line Pier seen in the distance*

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*

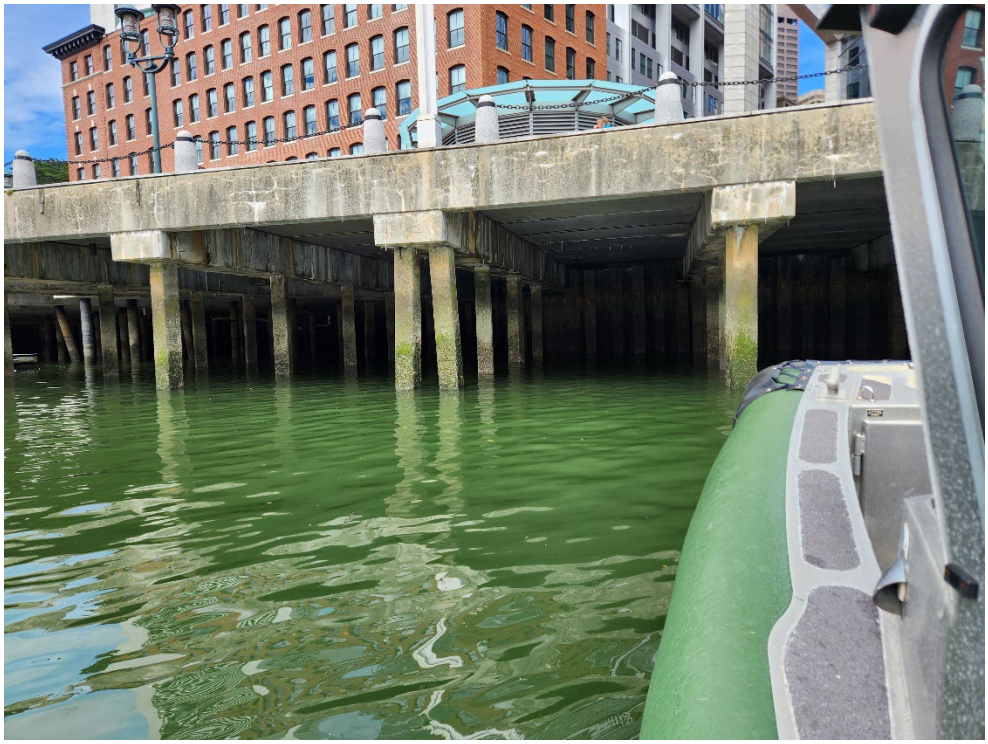
Survey Area:	***Fort Point Channel***	Date: *8/9/2023*

Image	Description
	- *End of the Fort Point Channel* - *Stone rip-rap and seawall* - *Drainage pipe* - *Macroalgae spp.*
	- *Fort Point Channel facing the South Boston shoreline* - *Stone seawall* - *Cobble beach* - *Macroalgae and algae* - *CSO BOS072 station visible in distance* - *Upland vegetation*

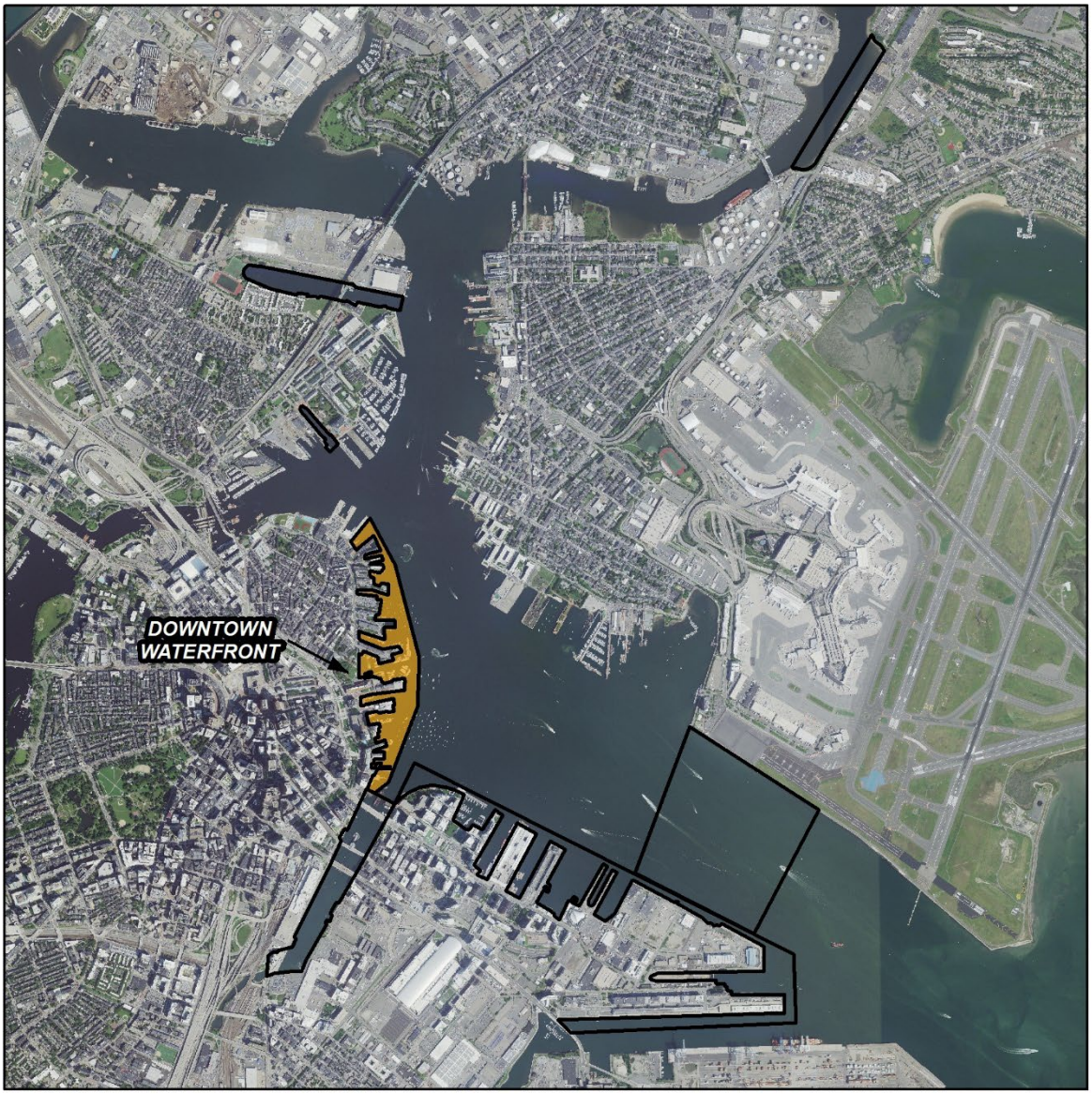
Survey Area:	***Fort Point Channel***	Date: *8/9/2023*

Image	Description
	- *Fort Point Channel facing the Downtown shoreline* - *Wood and concrete piling supported, developed shoreline* - *Steel bulkhead underneath*
	- *Fort Point Channel facing the Downtown shoreline* - *Wood pilings* - *Wood structures encasing bridge piers*

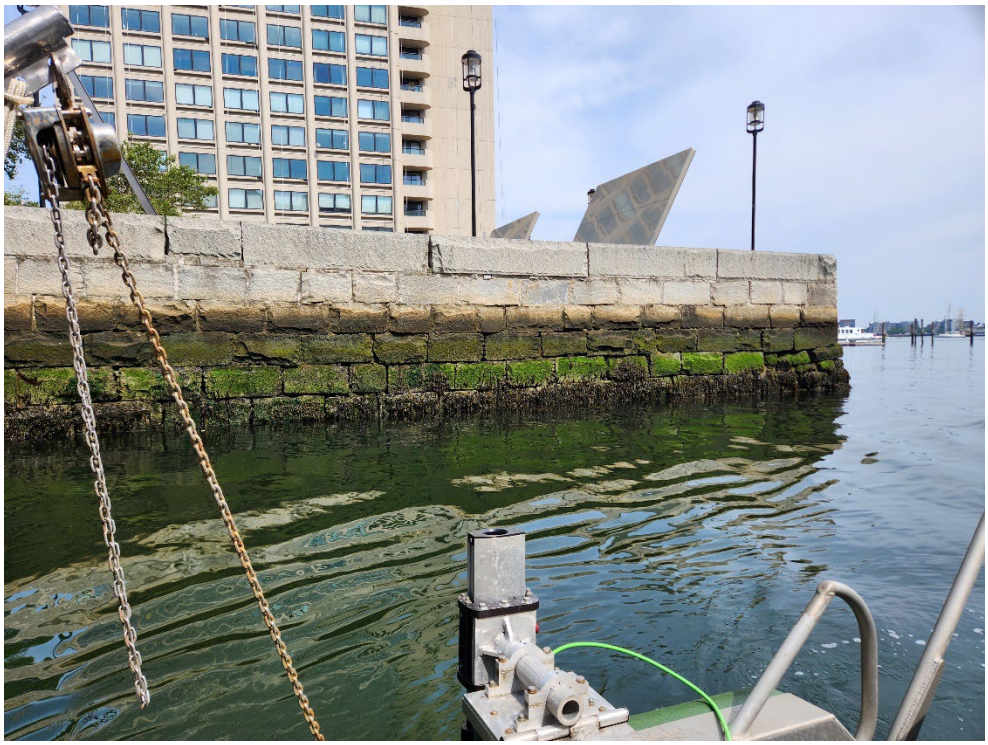
Survey Area:	***Fort Point Channel***	Date: *8/9/2023*

Image	Description
	- *Fort Point Channel facing the Downtown shoreline* - *Concrete piles with steel bulkhead underneath* - *Barnacles and algae*
	- *Fort Point Channel entrance facing the South Boston shoreline* - *Derelict bridge structures* - *Barnacles, macroalgae*

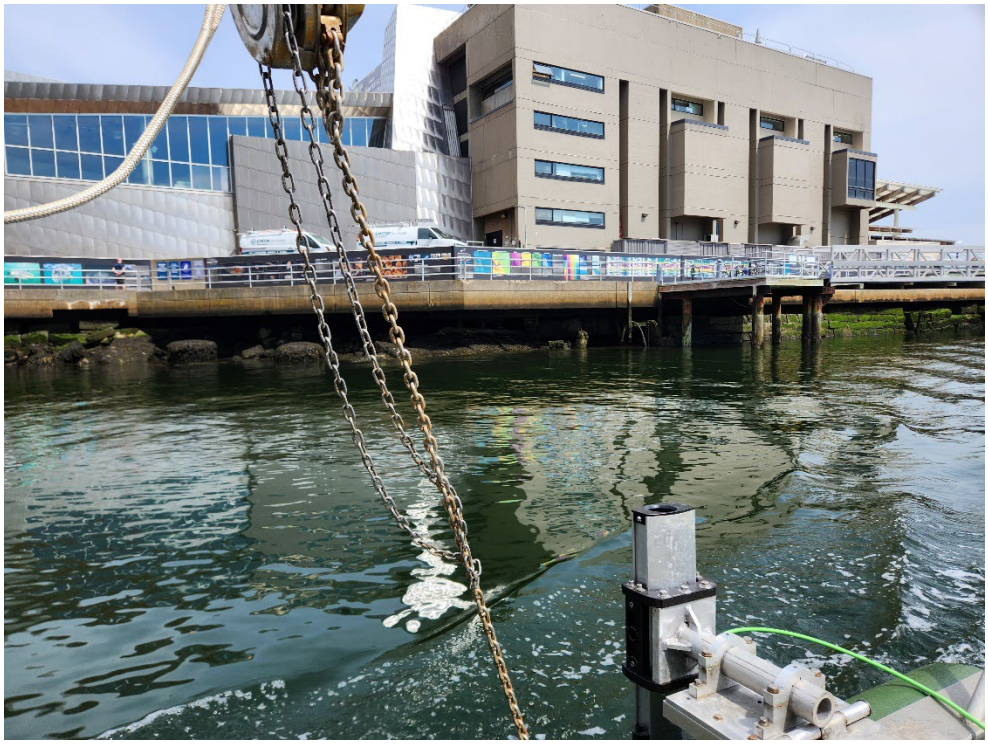
BOSTON HARBOR - DOWNTOWN WATERFRONT



Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

Image	Description
	- *Rowes Wharf* - *Developed, residential shoreline* - *Concrete piling supported wharf* - *Stone seawall* - *Macroalgae and barnacles*
	- *Rowes Wharf* - *Stone seawall* - *Macroalgae and barnacles* ** This characterizes most of the non-piling supported piers and shoreline*

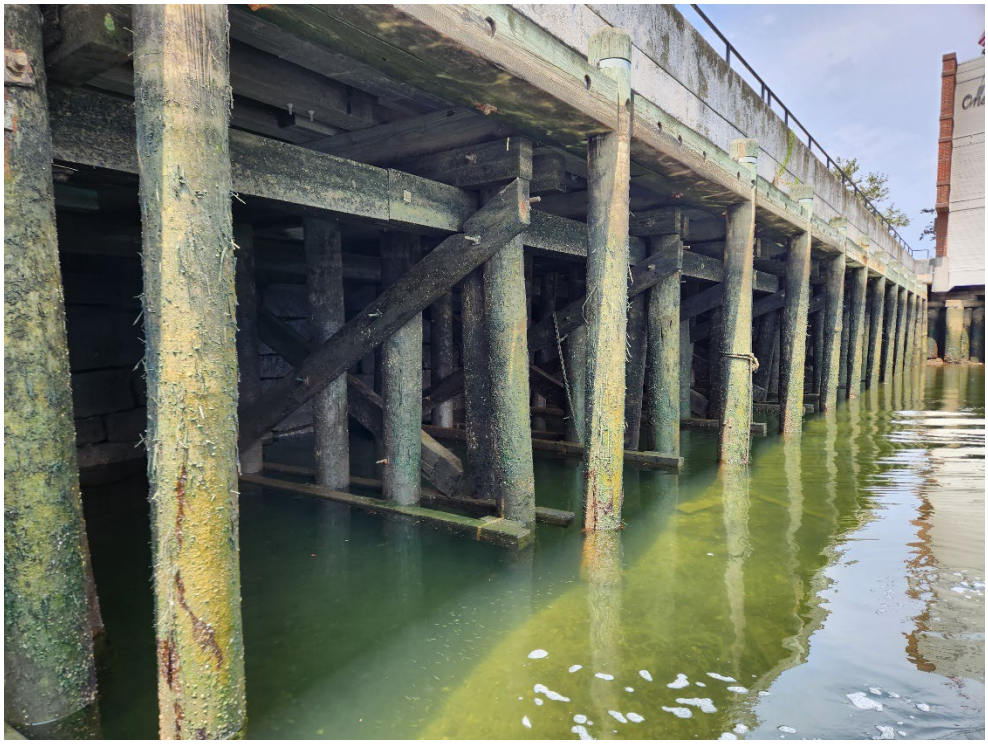
Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

Image	Description
	- *New England Aquarium, Central Wharf* - *Stone rip rap and seawall* - *Wooden piling supports, concrete structures* - *Macroalgae* **Aquarium intake pipe ~150 feet off the end of central wharf*
	- *New England Aquarium, Central Wharf* - *Stone seawall* - *Steel pilings and beams* - *Barnacles*

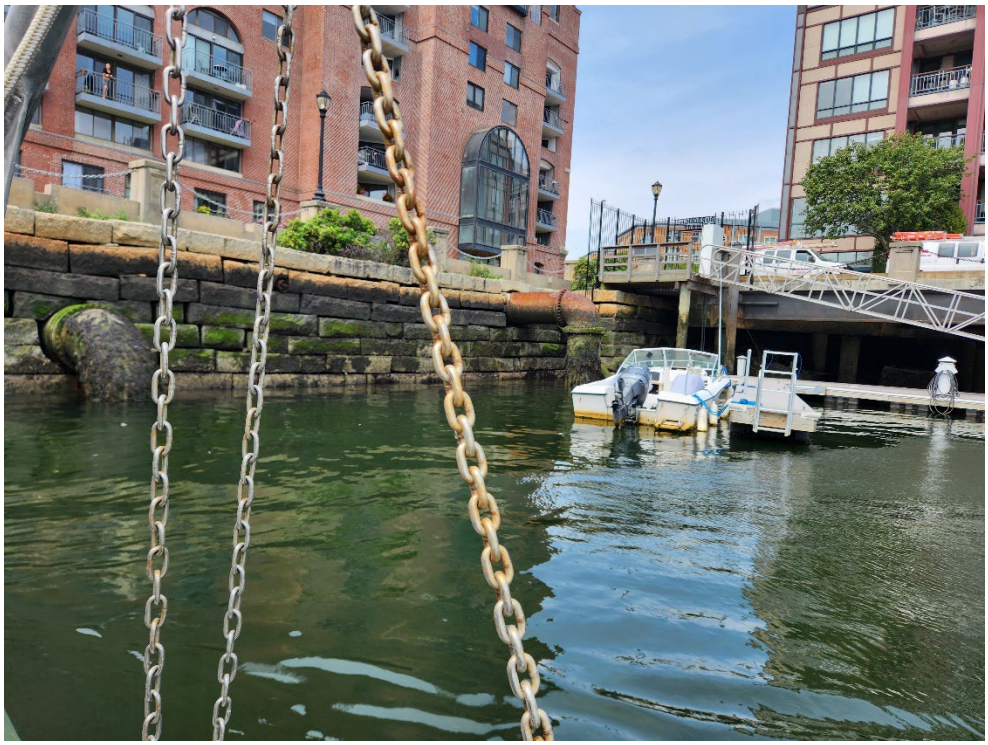
Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

Image	Description
	- *Marriot Hotel, Long Wharf* - *Stone seawall* - *Rocky/cobbly area with emergent drainage pipes* - *Macroalgae*
	- *Commercial Wharf* - *Stone seawall* - *Wooden piling supports*

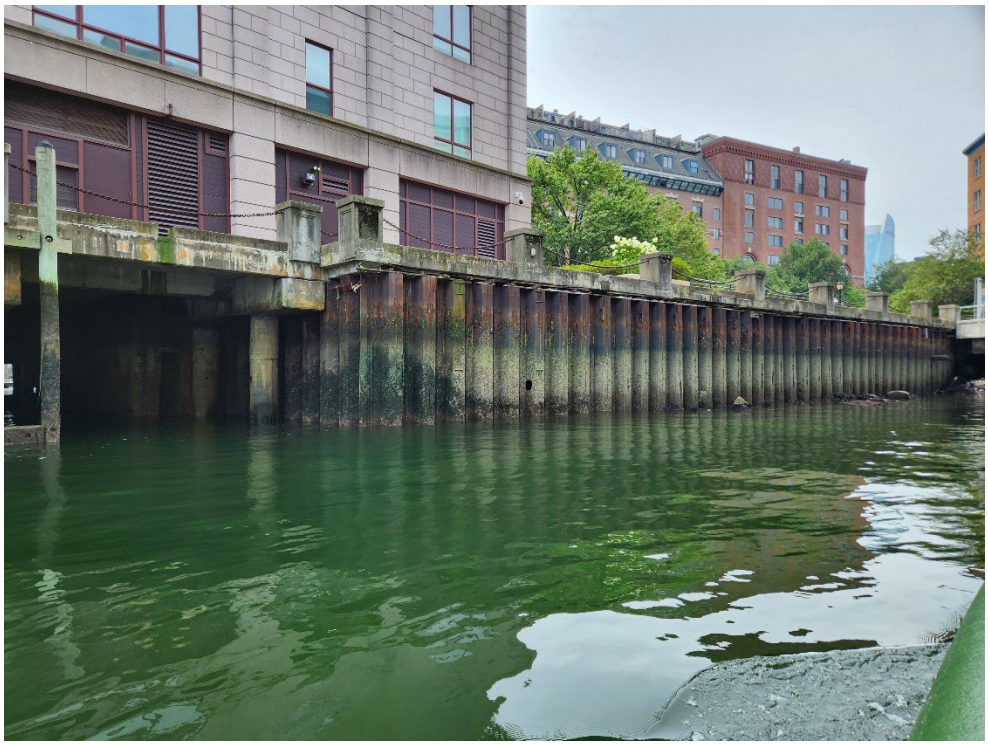
Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

Image	Description
	- *Channel between Commercial Wharf and Lewis Wharf* - *Stone seawall* - *Wooden pilings supporting Harborwalk* - *Algae, macroalgae, and barnacles*
	- *End of Lewis Wharf* - *Derelict wooden pilings*

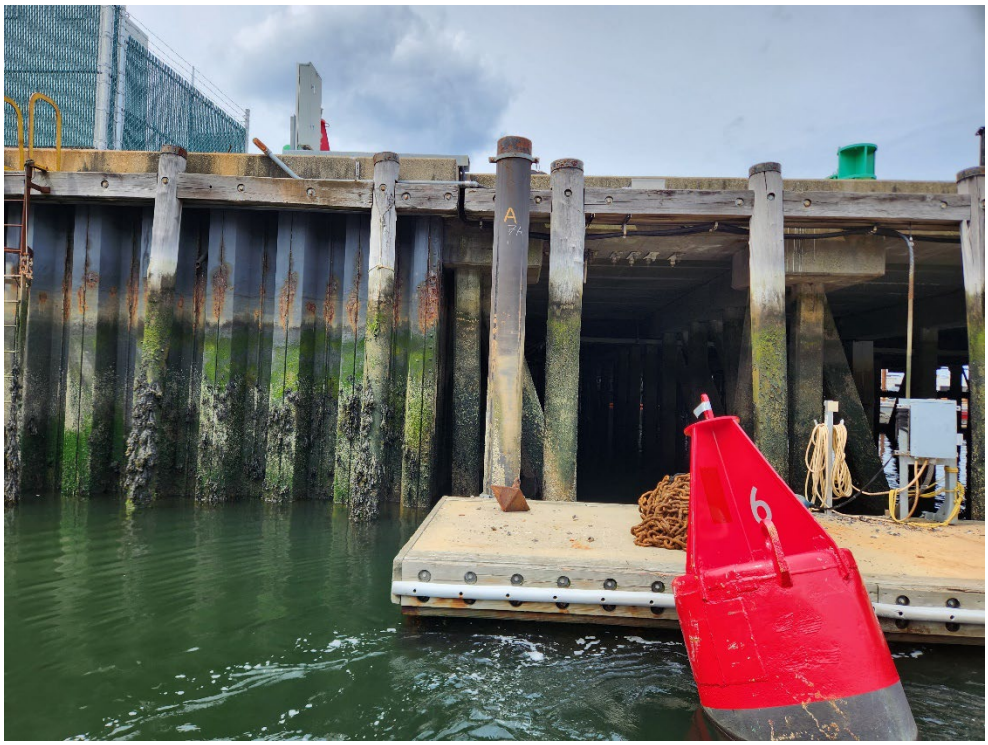
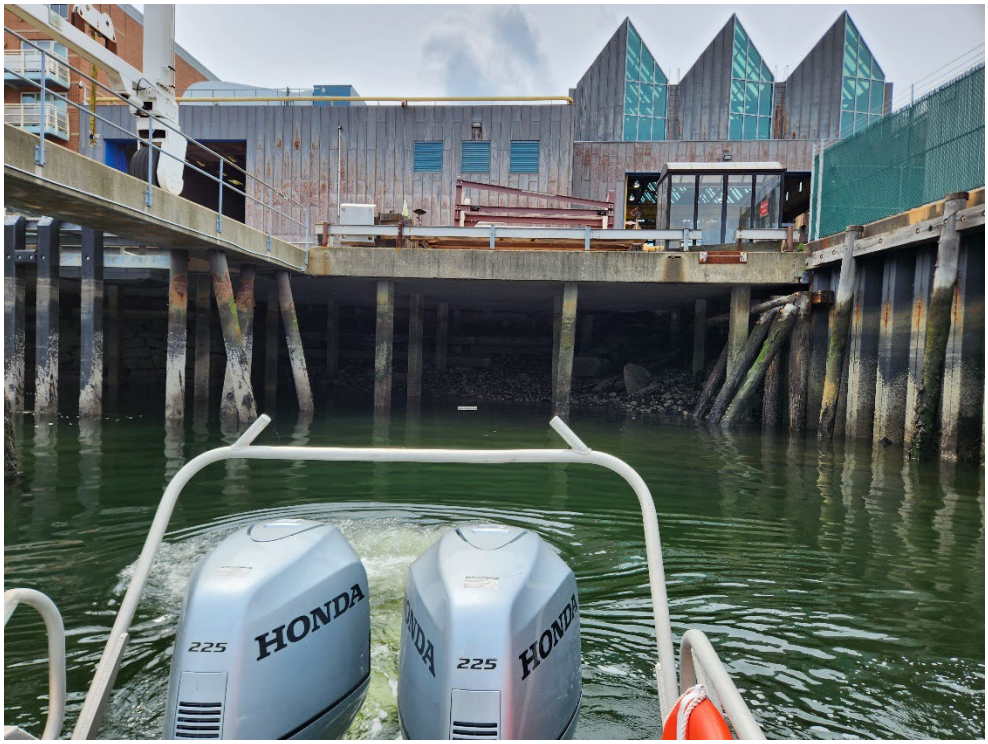
Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

Image	Description
	- *Pilot House Park, Lewis Wharf* - *Stone rip-rap and seawall* - *Drainage pipe* - *Algae and macroalgae*
	- *Union Wharf* - *Stone seawall* - *Pipe infrastructure* - *Algae and macroalgae* **Channel is located directly over Sumner and Callahan Tunnels*

Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

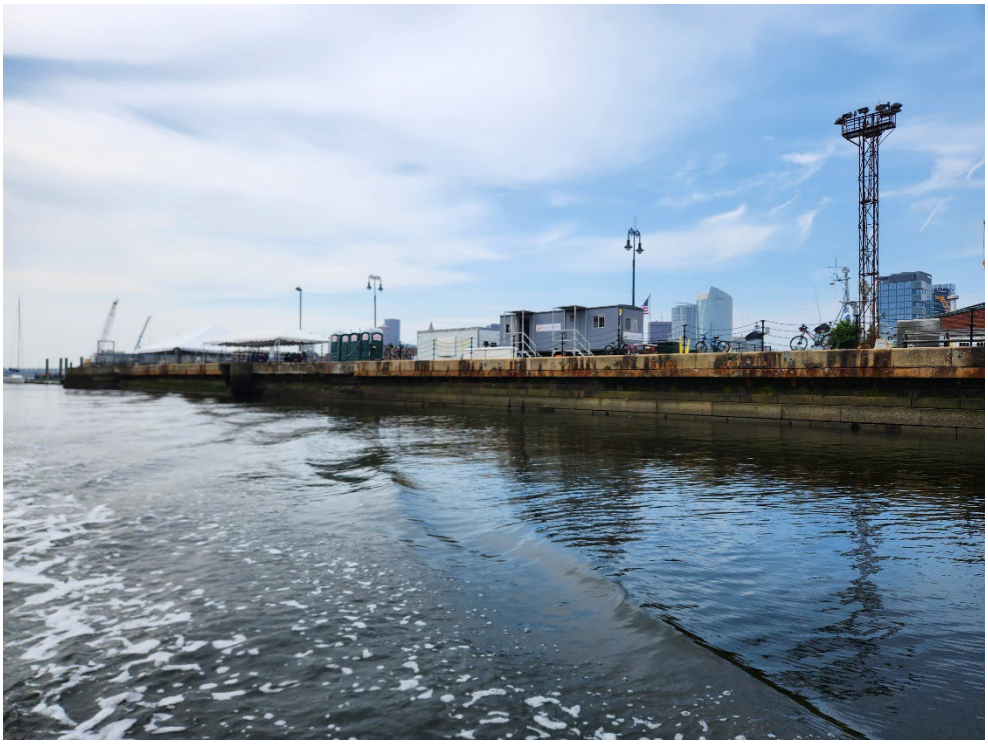
Image	Description
	- *Burroughs Wharf* - *Concrete piling supported pier* - *Algae, barnacles, macroalgae*
	- *Burroughs Wharf* - *Steel sheetpile bulkhead* - *Concrete piling supported pier* - *Algae and macroalgae*

Survey Area:	***Downtown Waterfront***	Date: *8/10/2023*

Image	Description
	- *U.S. Coast Guard Station* - *Concrete slab pier* - *Steel sheetpile bulkhead* - *Wooden pilings* - *Algae and macroalgae*
	- *U.S. Coast Guard Station* - *Steel piling-supported concrete slab walkways* - *Stone seawall* - *Algae and barnacles*

BOSTON HARBOR – CHARLESTOWN NAVY YARD

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

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

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

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

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

BOSTON HARBOR – LITTLE MYSTIC CHANNEL

Survey Area:	***Little Mystic Channel***	Date: *8/7/2023*

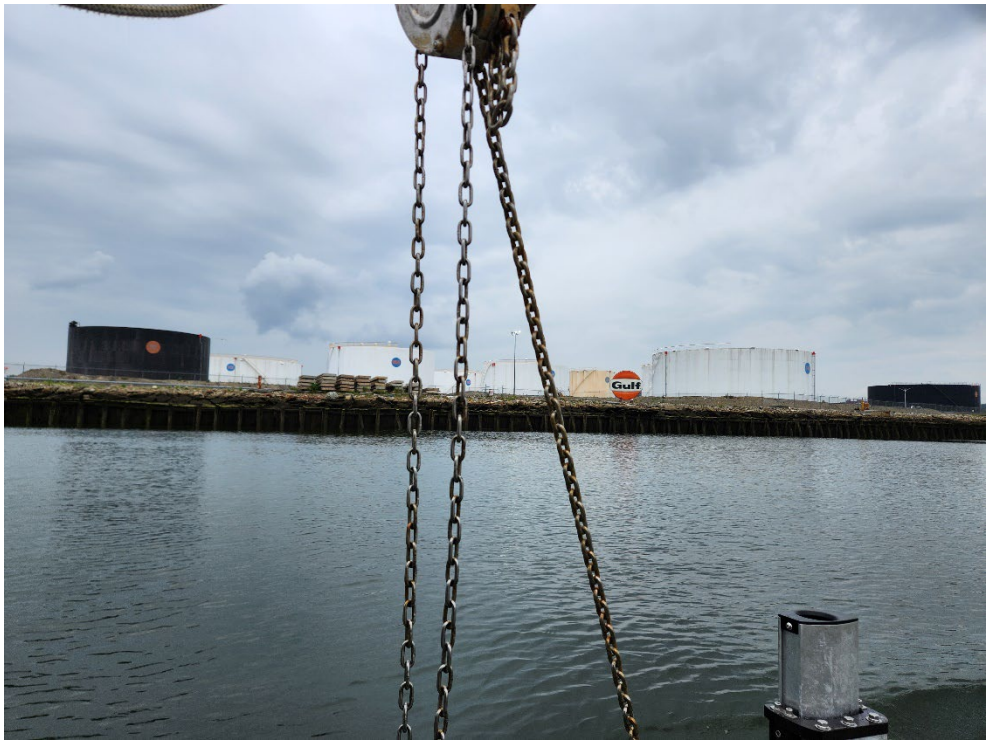
Image	Description
	- *Little Mystic Channel facing the southern shoreline* - *Developed, residential area* - *Sheetpile bulkhead and stone seawall* - *Apartment building complex*
	- *Little Mystic Channel facing the southern shoreline* - *Sheetpile bulkhead and stone seawall* - *Landscaped upland vegetation*

Survey Area:	***Little Mystic Channel***	Date: *8/7/2023*

Image	Description
	- *Little Mystic Channel facing the northern shoreline* - *Stone seawall* - *Macroalgae and upland vegetation* - *Chelsea Street and Tobin Bridges*
	- *Little Mystic Channel facing the northern shoreline* - *Stone seawall* - *Entrance to boat ramp* - *Macroalgae*

BOSTON HARBOR - CHELSEA RIVER

Survey Area:	***Chelsea River***	Date: *8/7/2023*

Image	Description
	- *Chelsea River facing the Chelsea shoreline* - *Piling-supported shoreline* - *Bulkhead and rock retention wall* - *Cobble beach*
	- *Chelsea River facing the Chelsea shoreline* - *Bulkhead and piling-supported shoreline* - *Industrial area with fuel storage tanks*

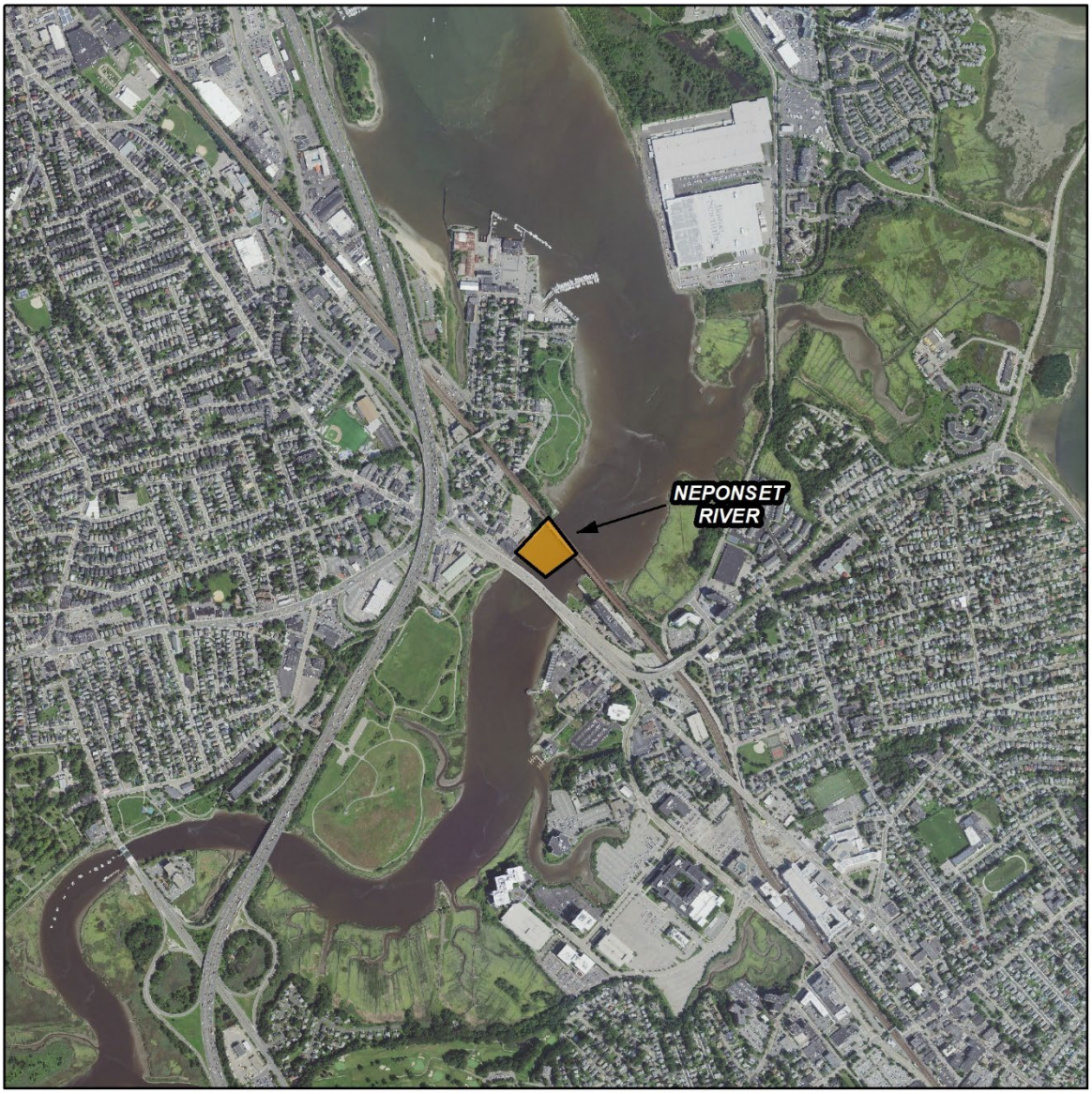
Survey Area:	***Chelsea River***	Date: *8/7/2023*

Image	Description
	- *Chelsea River facing the East Boston shoreline* - *Stone seawall* - *Marine debris* - *Sandy/gravelly/cobbly beach* - *Upland vegetation*
	- *Chelsea River facing the East Boston shoreline* - *Rocky shoreline* - *Derelict pilings* - *Barnacles* - *Upland vegetation*

Survey Area:	***Chelsea River***	Date: *8/7/2023*

Image	Description
	- *Chelsea River facing the East Boston shoreline* - *Rocky shoreline* - *Driftwood and marine debris* - *Marsh grass* - *Upland vegetation*
	- *Chelsea River facing the East Boston shoreline* - *Abandoned industrial building* - *Stone bulkhead/ seawall* - *Algae & macroalgae*

NEPONSET RIVER



Survey Area:	***Neponset River***	Date: *8/10/2023*

Image	Description
	- *Western shoreline, Neponset Trail* - *Concrete slab walkway and support structure forward of stone seawall* - *Derelict wood pilings* - *Algae & macroalgae*
	- *Western shoreline, Neponset Trail and Planet Fitness building* - *Concrete slab walkway and support structure forward of stone seawall* - *Derelict wood pilings and sheetpile section* - *Draingage outfall* - *Stone and concrete pier of Neoponset Bridge* - *Algae & macroalgae*

Survey Area:	***Neponset River***	Date: *8/10/2023*

Image	Description
	- *Western shoreline, Neponset Trail and Planet Fitness building* - *Concrete slab walkway and support structure forward of stone seawall* - *Drainage outfalls* - *Stone and concrete piers of Neoponset Bridge* - *Algae and macroalgae*
	- *Western shoreline, Neponset Trail and Planet Fitness building* - *Neoponset Bridge structure* - *Rip rap seawall*

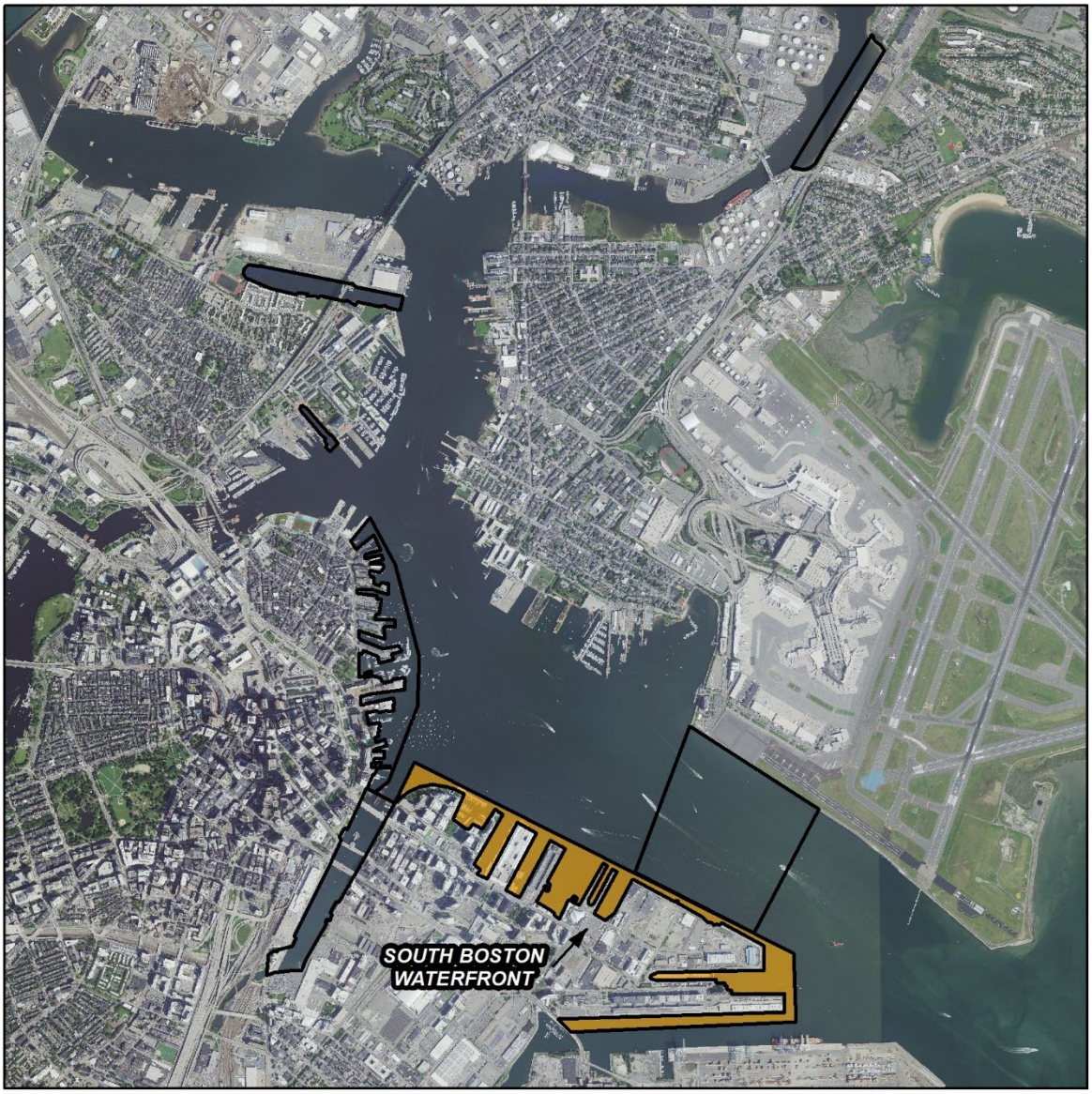
Survey Area:	***Neponset River***	Date: *8/10/2023*

Image	Description
	- *Western shoreline, Neponset Trail and Planet Fitness building* - *Concrete slab walkway and support structure forward of stone seawall* - *Drainage outfalls* - *Stone and concrete piers of Neoponset Bridge*
	- *Western shoreline, Neponset Trail and Planet Fitness building* - *Concrete slab walkway and support structure forward of stone seawall* - *Neponset-Anderson Rail Road Bridge*

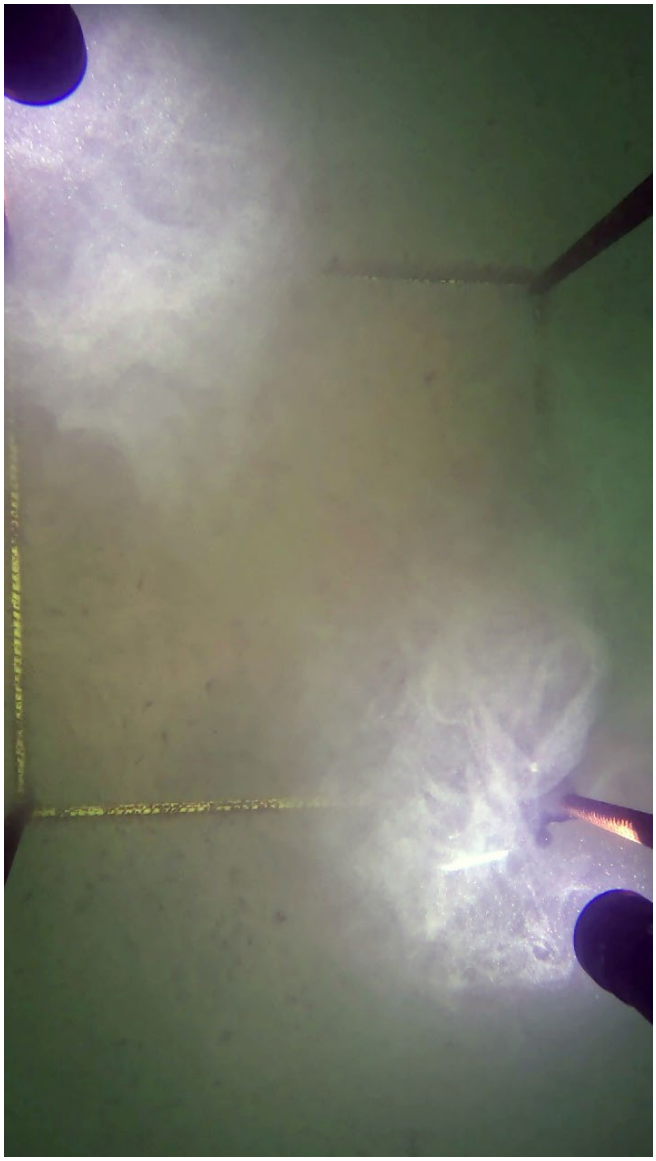
APPENDIX B

SUBTIDAL IMAGE DATABASE

BOSTON HARBOR - SOUTH BOSTON WATERFRONT



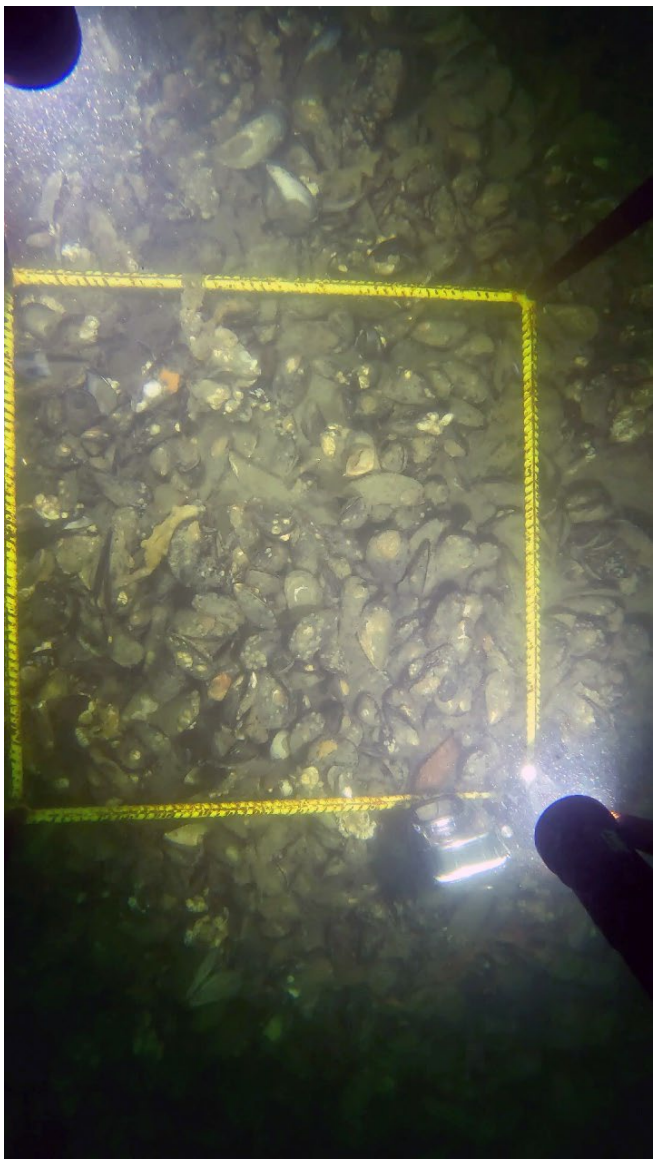
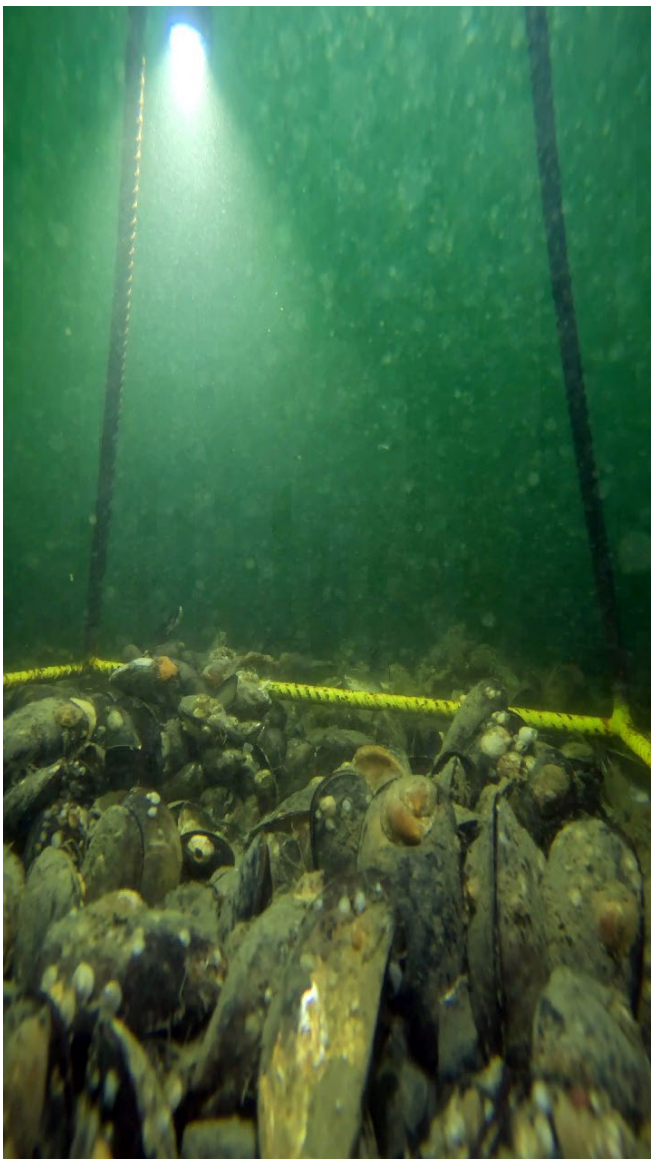
Survey Area:	***South Boston Waterfront***		Station:	***SB-1***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.349831*	Longitude (NAD83): *-71.033158*	Water Depth (FT): *-28.3*		

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.

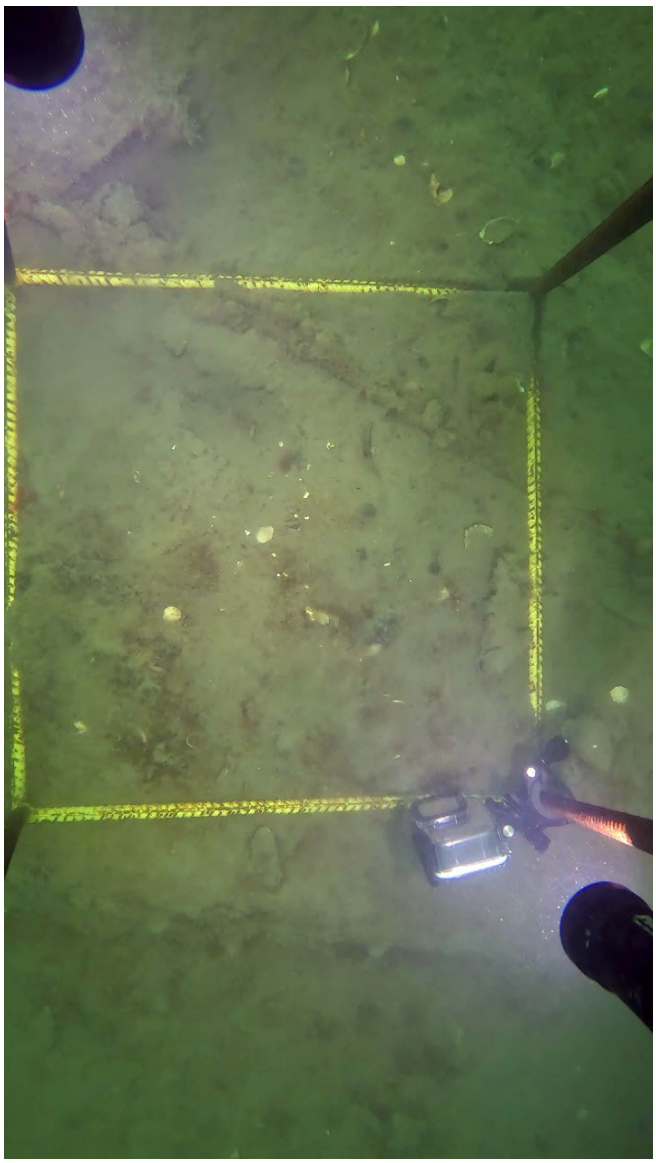
Survey Area:	***South Boston Waterfront***		Station:	***SB-2***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.351144*	Longitude (NAD83): *-71.034120*	Water Depth (FT): *-24.5*		

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:	***South Boston Waterfront***		Station:	***SB-3***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.351245*	Longitude (NAD83): *-71.035258*	Water Depth (FT): *-25.2*		

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.

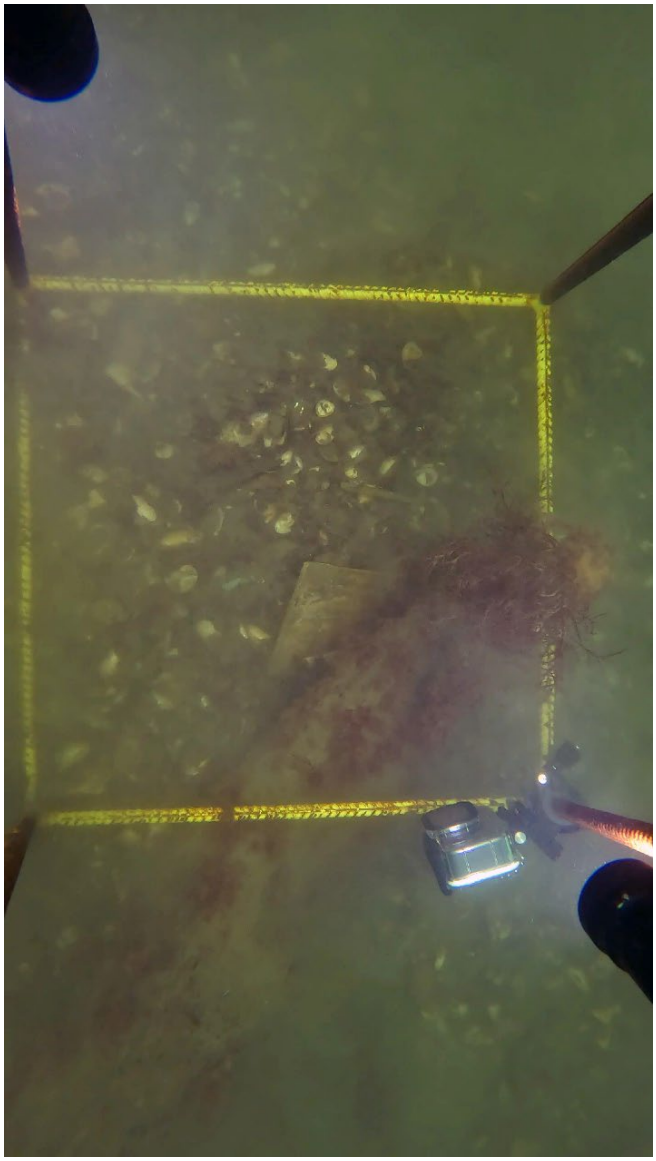
Survey Area:	***South Boston Waterfront***		Station:	***SB-4***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350706*	Longitude (NAD83): *-71.036957*	Water Depth (FT): *-22.4*		

Plan View	Profile View

Notes:

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

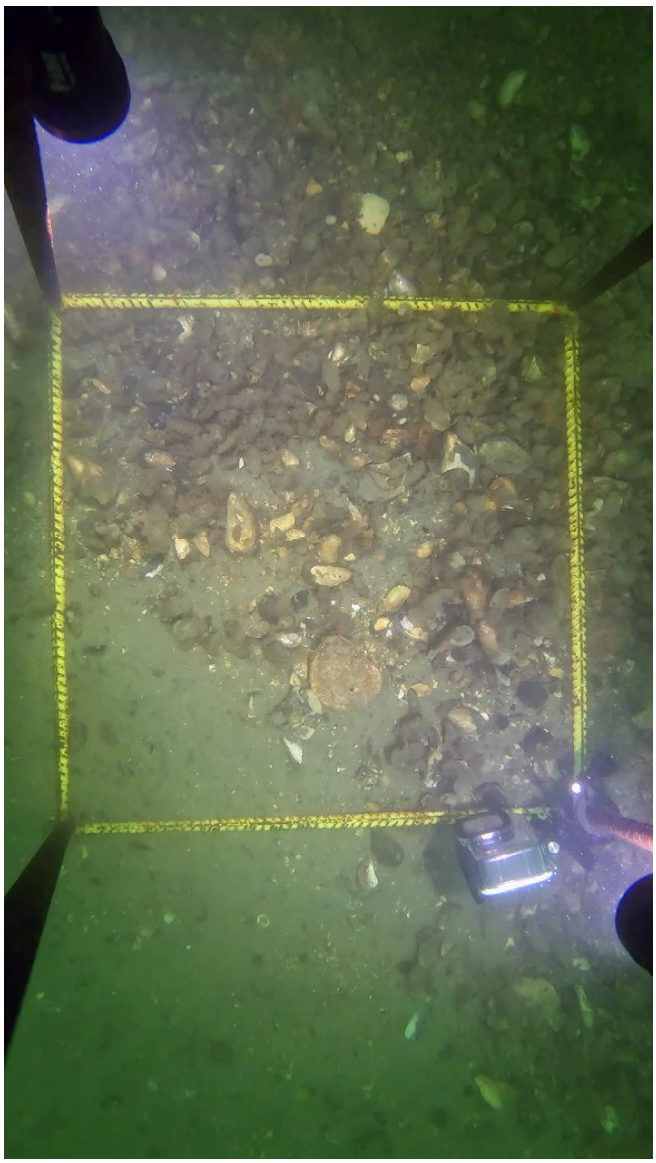
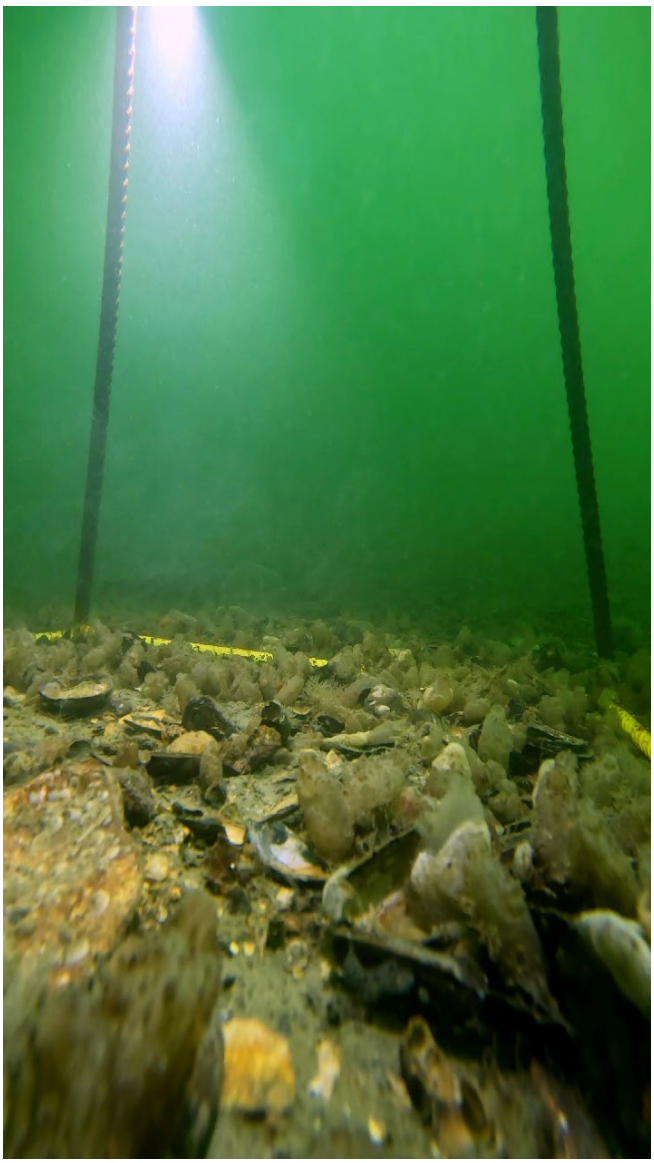
Survey Area:	***South Boston Waterfront***		Station:	***SB-5***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.348652*	Longitude (NAD83): *-71.037288*	Water Depth (FT): *-13.0*		

Plan View	Profile View
	

Notes:

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

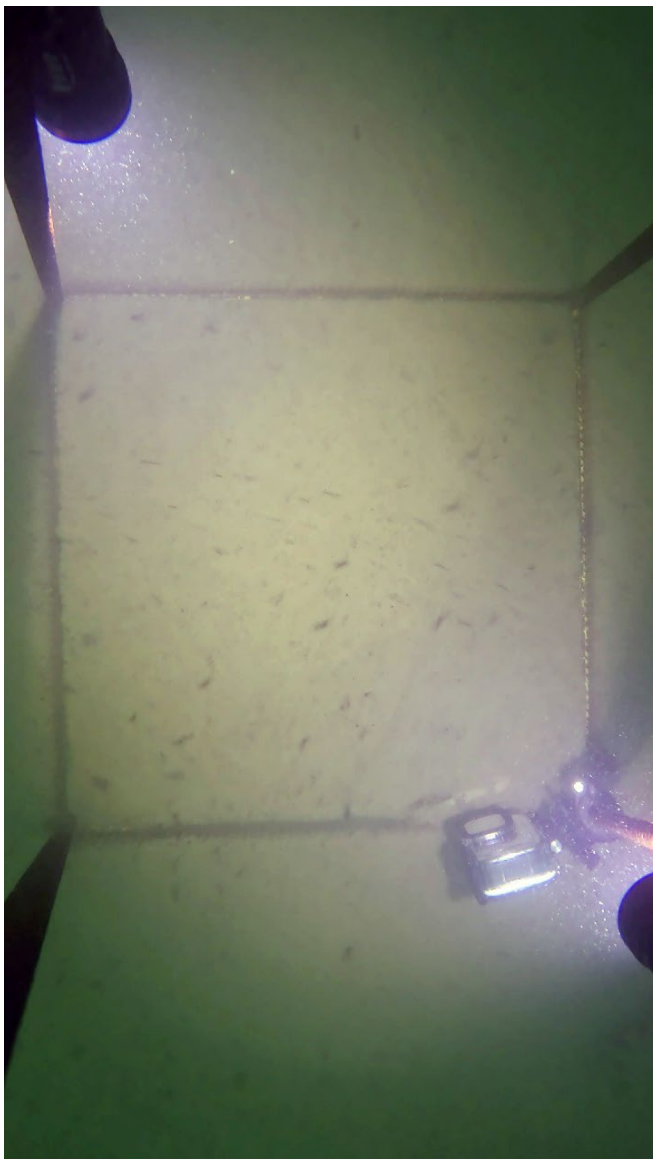
Survey Area:	***South Boston Waterfront***		Station:	***SB-6***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.352345*	Longitude (NAD83): *-71.037725*	Water Depth (FT): *-24.6*		

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.

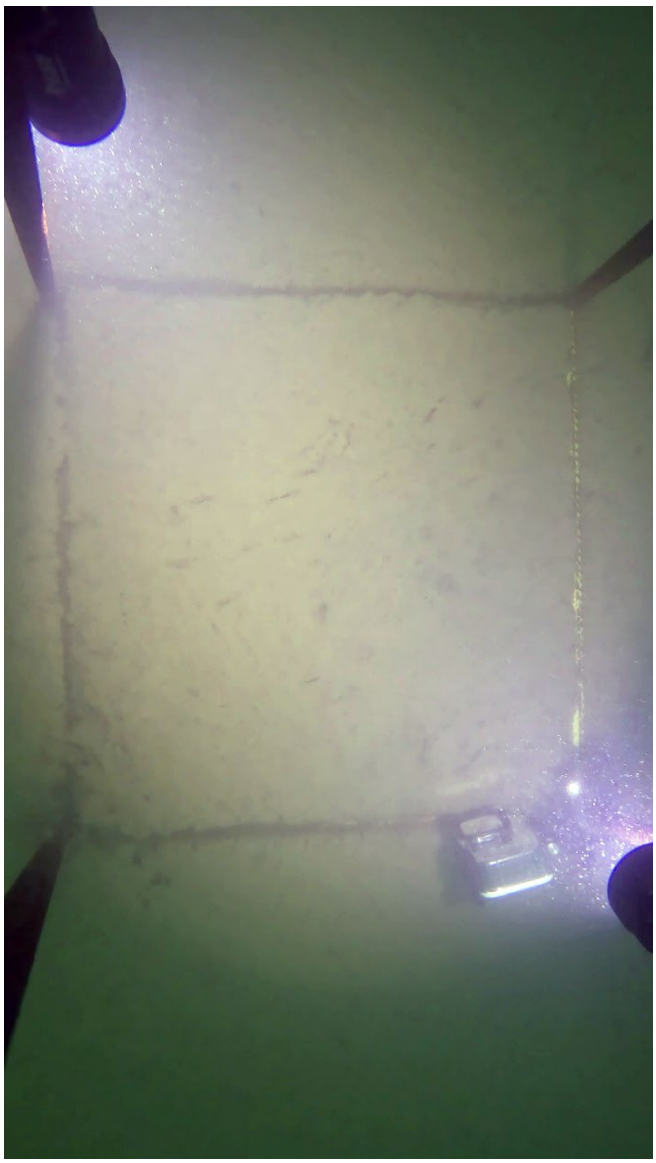
Survey Area:	***South Boston Waterfront***		Station:	***SB-7***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350716*	Longitude (NAD83): *-71.039607*	Water Depth (FT): *-33.3*		

Plan View	Profile View
	

Notes:

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

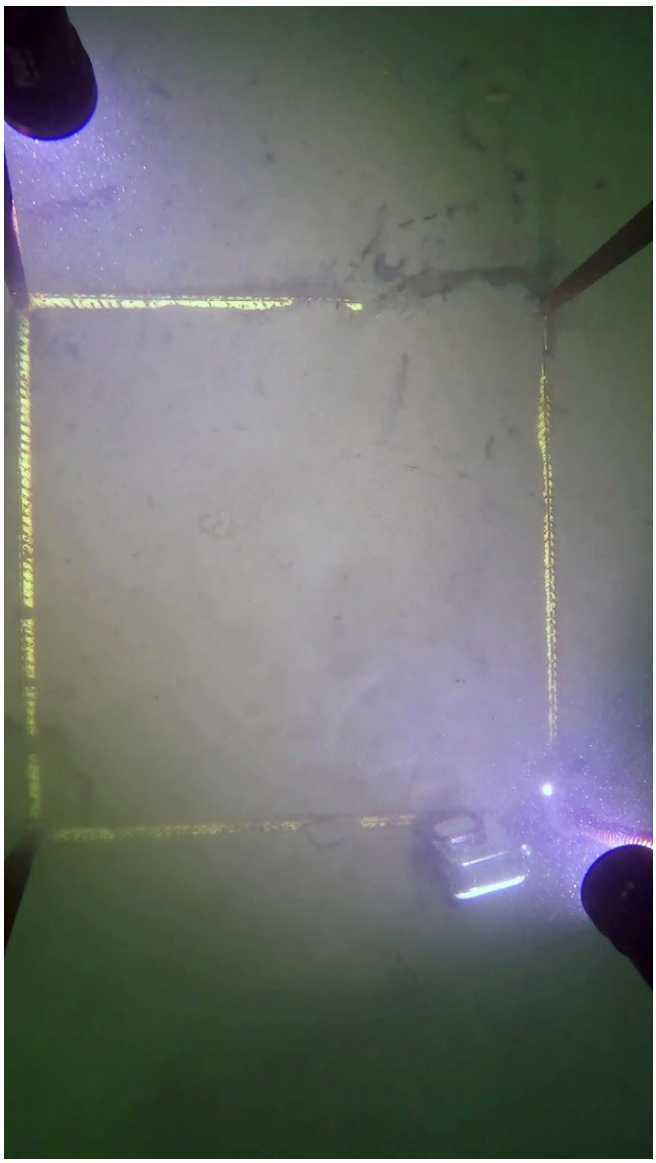
Survey Area:	***South Boston Waterfront***		Station:	***SB-8***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.353340*	Longitude (NAD83): *-71.038951*	Water Depth (FT): *-35.1*		

Plan View	Profile View
	

Notes:

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

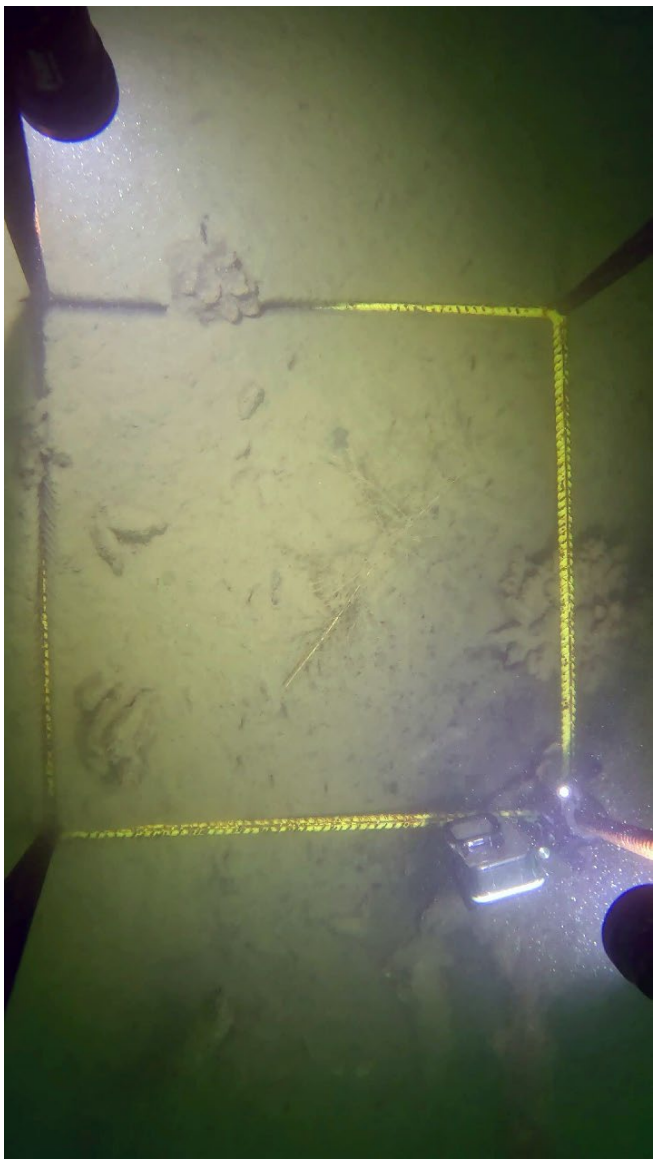
Survey Area:	***South Boston Waterfront***		Station:	***SB-9***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.352435*	Longitude (NAD83): *-71.040702*	Water Depth (FT): *-35.5*		

Plan View	Profile View
	

Notes:

Bare silt with infunal invertebrate tubes and burrows. Located adjacent to Commonwealth Pier.

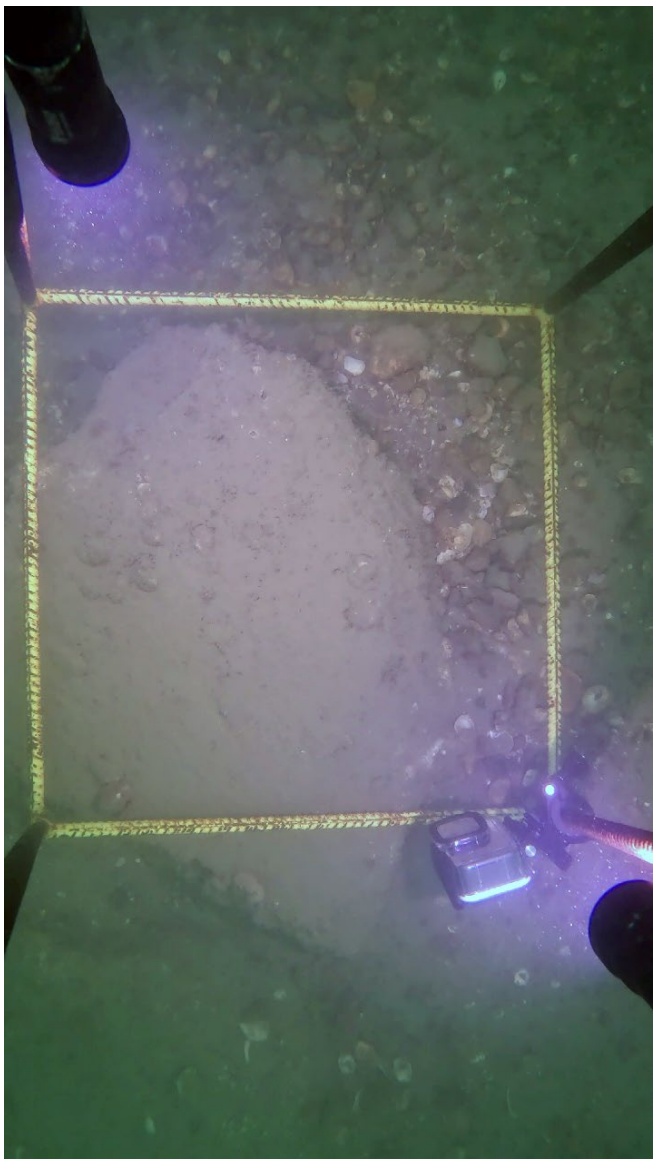
Survey Area:	***South Boston Waterfront***		Station:	***SB-10***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.353332*	Longitude (NAD83): *-71.040628*	Water Depth (FT): *-37.4*		

Plan View	Profile View
	

Notes:

Silt with infaunal invertebrate tubes, burrows, and castings as well as (likely Molgulidae sp., Styaela clava, or Ascidiella 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.

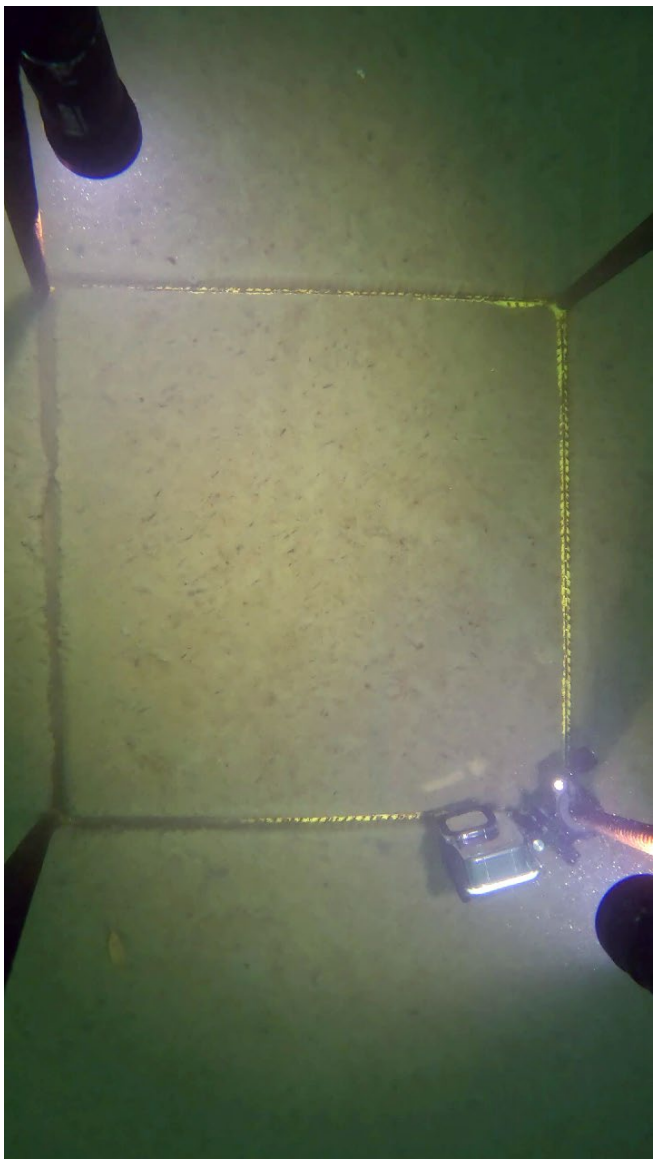
Survey Area:	***South Boston Waterfront***		Station:	***SB-11***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355165*	Longitude (NAD83): *-71.043774*	Water Depth (FT): *-23.4*		

Plan View	Profile View
	

Notes:

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

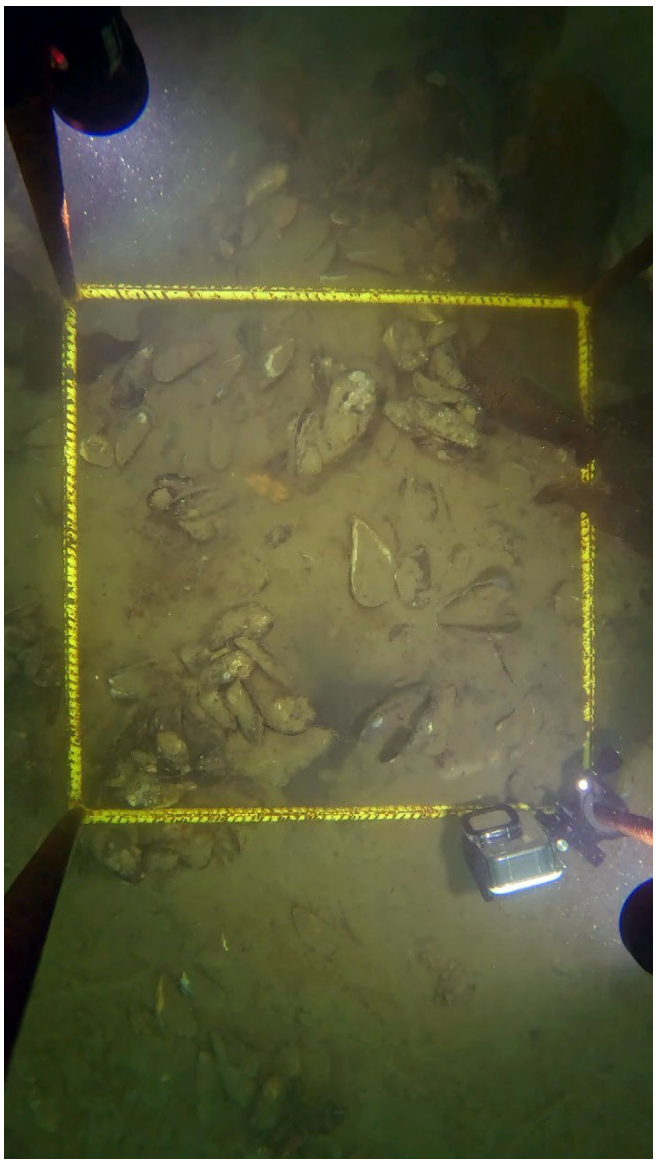
Survey Area:	***South Boston Waterfront***		Station:	***SB-12***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355459*	Longitude (NAD83): *-71.044644*	Water Depth (FT): *-24.0*		

Plan View	Profile View
	

Notes:

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

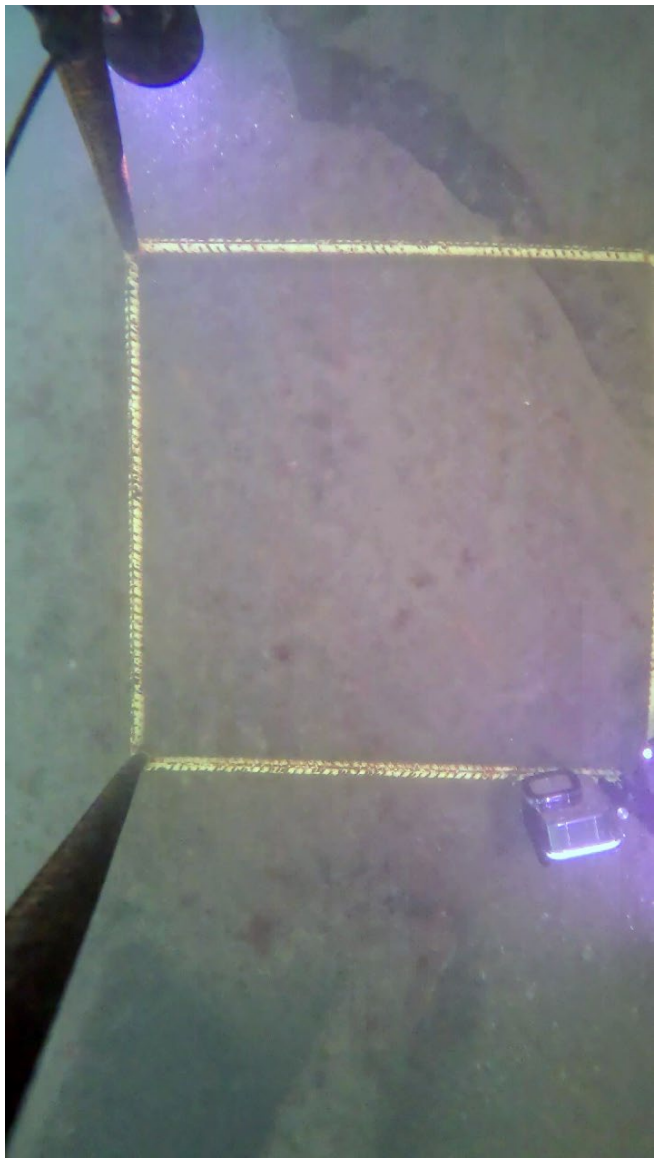
Survey Area:	***South Boston Waterfront***		Station:	***SB-13***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355243*	Longitude (NAD83): *-71.045759*	Water Depth (FT): *-16.2*		

Plan View	Profile View
	

Notes:

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

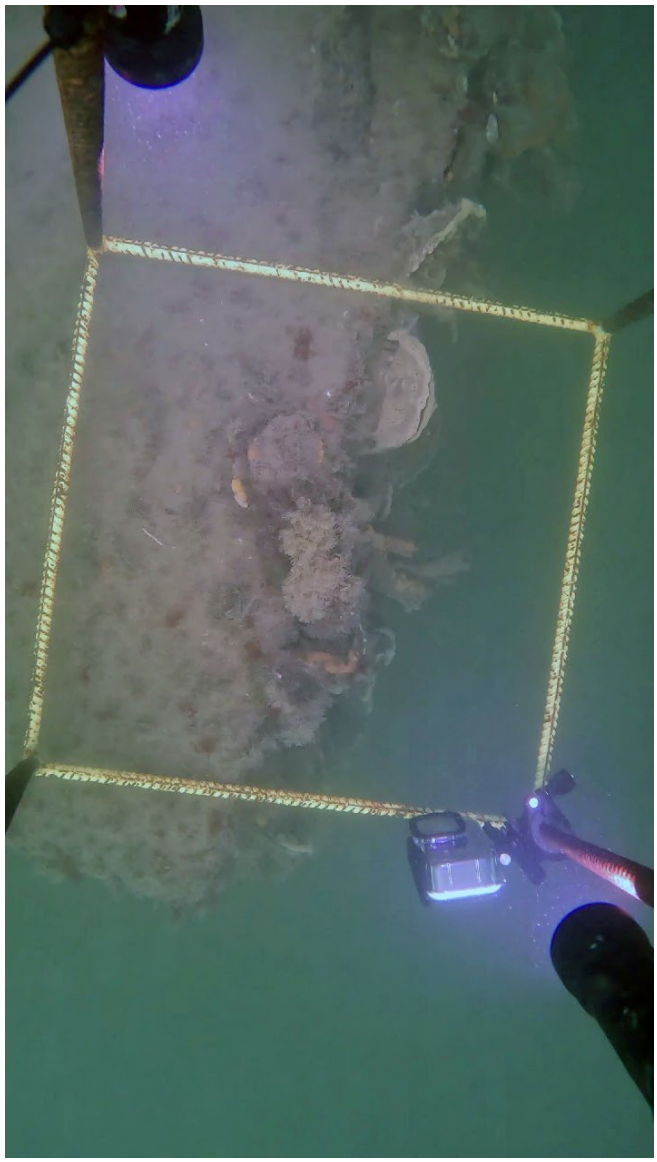
Survey Area:	***South Boston Waterfront***	Transect:	***SB-14***	*Capture:*	***01***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform:	*0.25m^2 drop frame - plan and profile cameras*		
Start Coordinates (NAD83): *42.355409, -71.046470*		Stop Coordinates (NAD83): *42.355407, -71.046486*		Water Depth (FT): *-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.

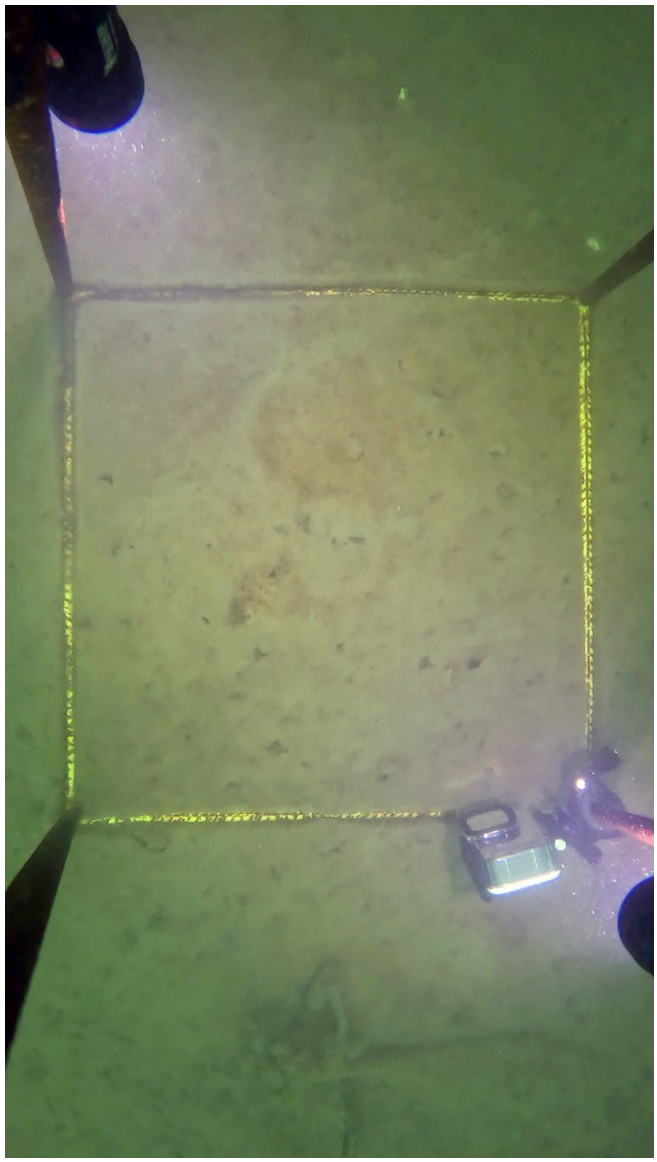
Survey Area:	***South Boston Waterfront***	Transect:	***SB-14***	*Capture:*	***02***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform:	*0.25m^2 drop frame - plan and profile cameras*		
Start Coordinates (NAD83): *42.355409, -71.046470*		Stop Coordinates (NAD83): *42.355407, -71.046486*		Water Depth (FT): *-21.1*	

Plan View	Profile View
	

Notes:

Sunken barge with attached ectoprocts (Bugula sp.), hydroids, solitary tunicates (Styela clava), encrusting tunicates (Didemnum sp.), and encrusting sponges (Halichondria panicea). Located near Fan Pier, in front of the Federal Courthouse.

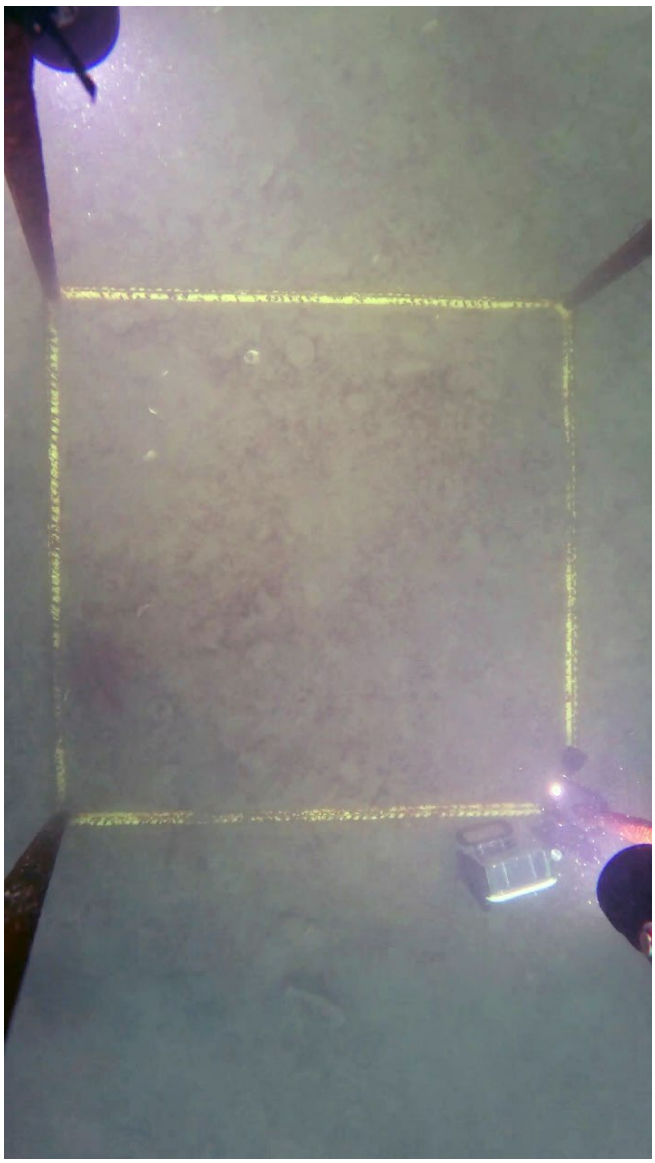
Survey Area:	***South Boston Waterfront***	Transect:	***SB-14***	*Capture:*	***03***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform:	*0.25m^2 drop frame - plan and profile cameras*		
Start Coordinates (NAD83): *42.355409, -71.046470*		Stop Coordinates (NAD83): *42.355407, -71.046486*		Water Depth (FT):	*-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.

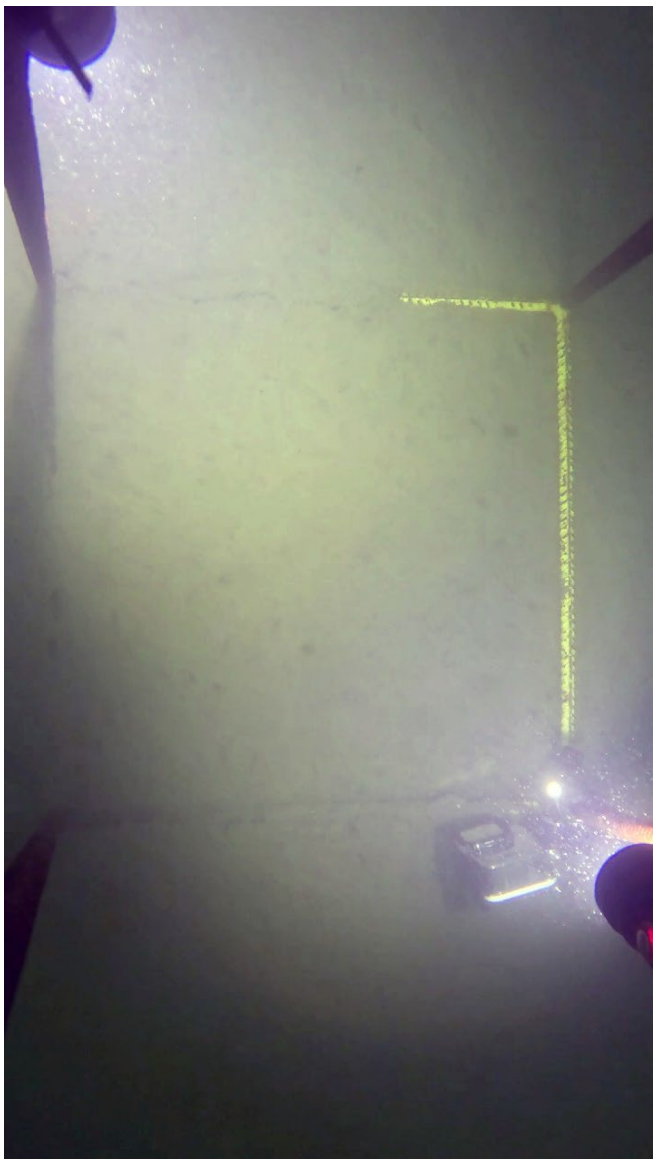
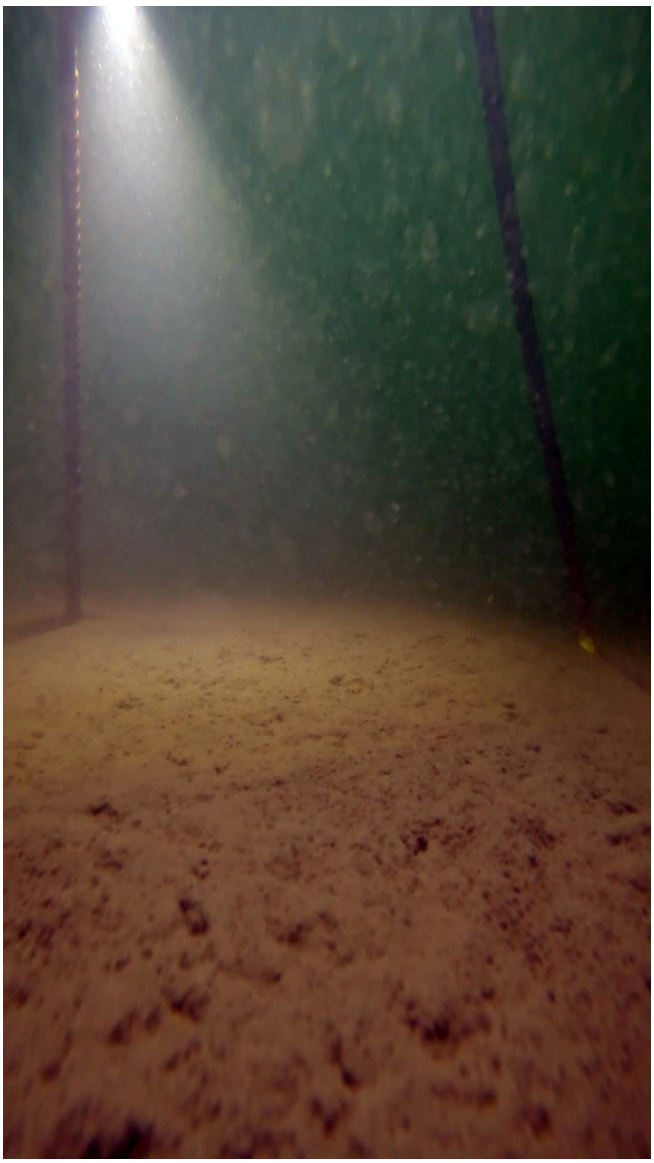
Survey Area:	***South Boston − Reserved Channel***		Station:	***SB-15***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.342188*	Longitude (NAD83): *-71.035435*	Water Depth (FT): *-7.5*		

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.

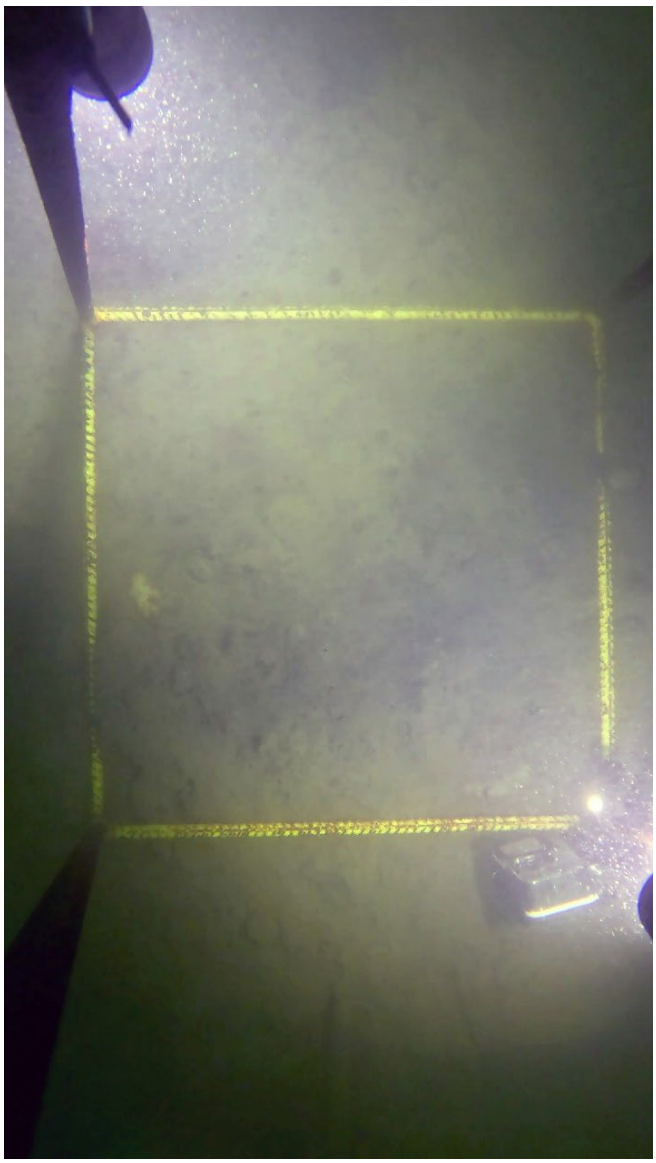
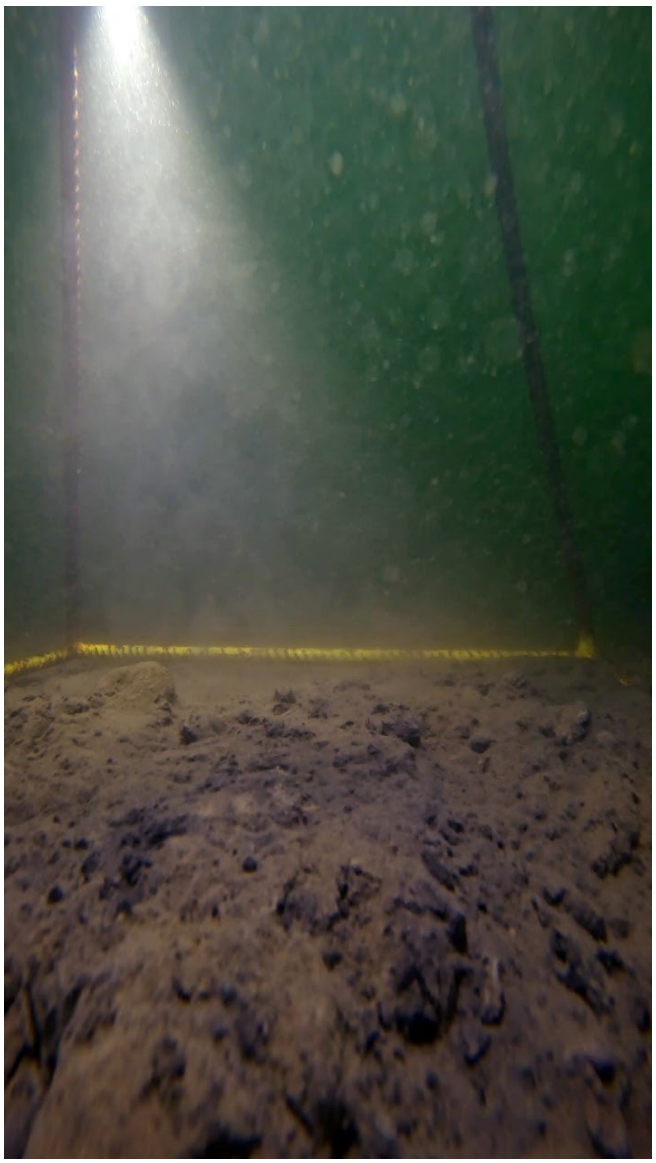
Survey Area:	***South Boston − Reserved Channel***		Station:	***SB-16***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.342757*	Longitude (NAD83): *-71.034740*	Water Depth (FT): *-36.4*		

Plan View	Profile View
	

Notes:

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

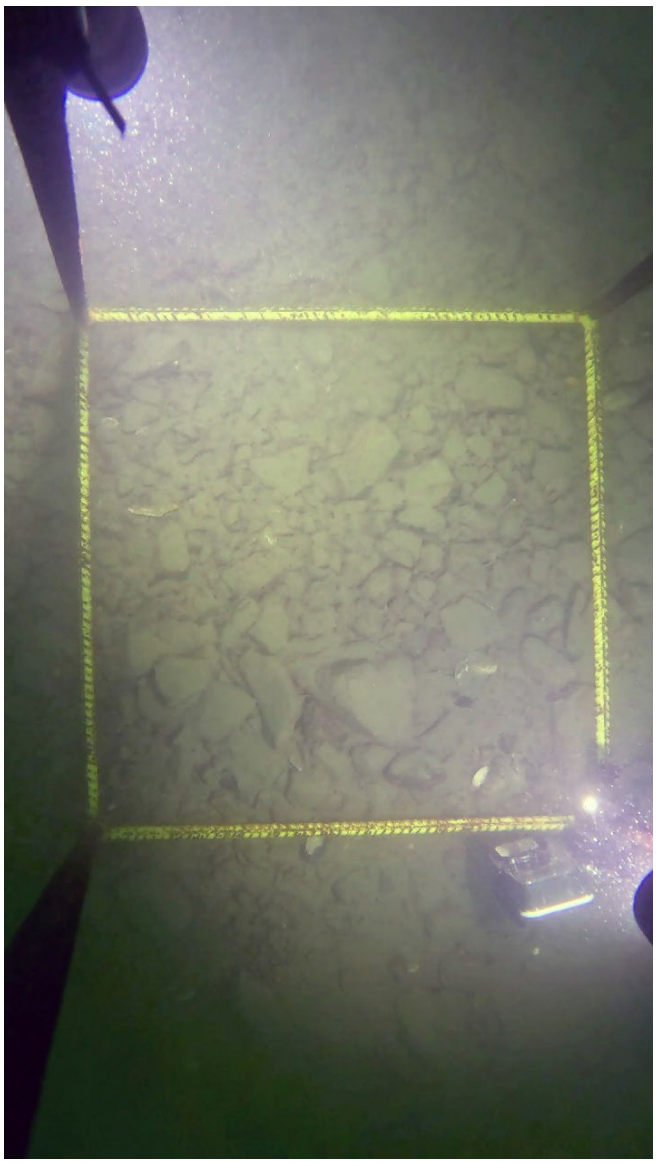
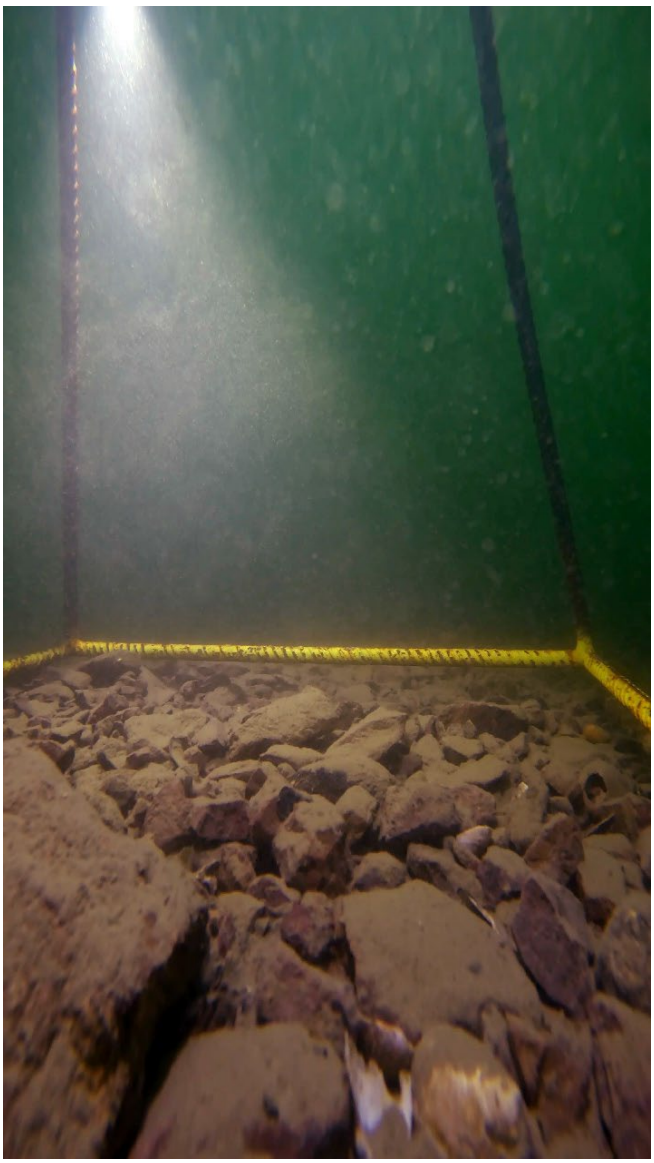
Survey Area:	***South Boston − Reserved Channel***		Station:	***SB-17***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.343299*	Longitude (NAD83): *-71.031417*	Water Depth (FT): *-38.5*		

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.

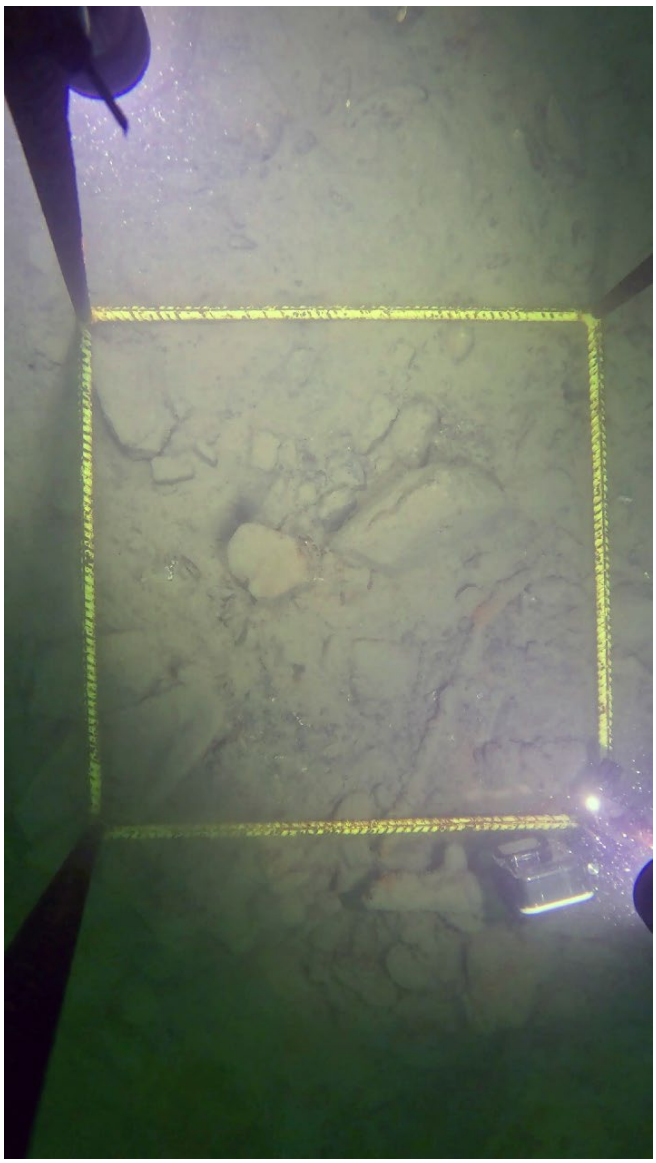
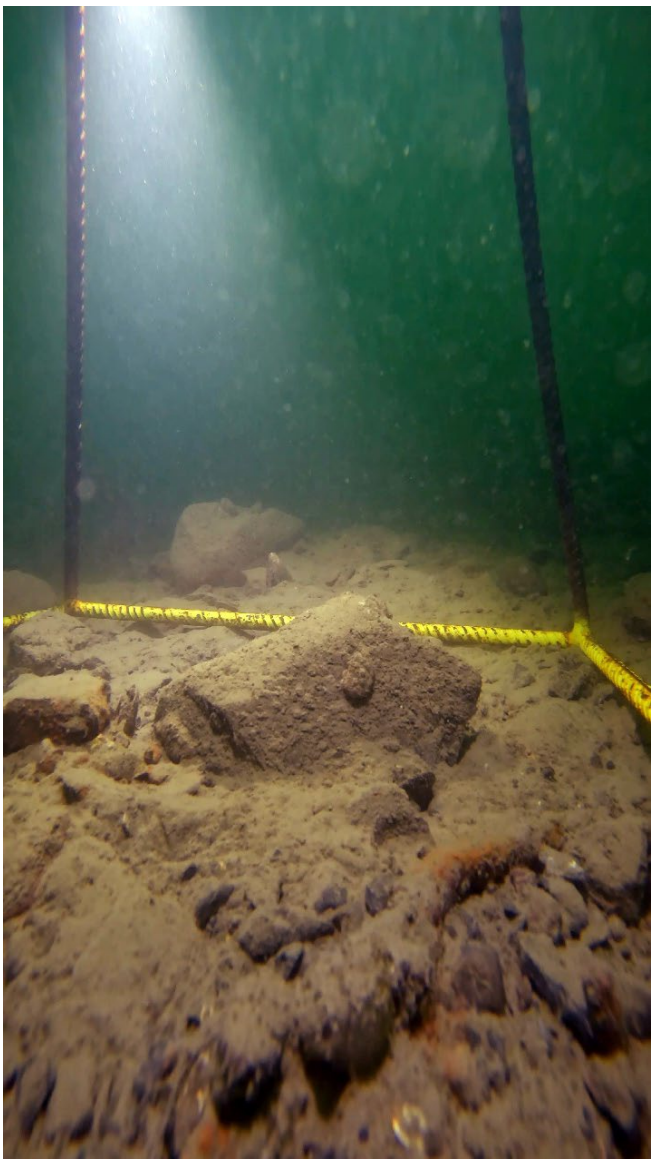
Survey Area:	***South Boston − Reserved Channel***		Station:	***SB-18***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.343336*	Longitude (NAD83): *-71.029401*	Water Depth (FT): *-40.3*		

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.

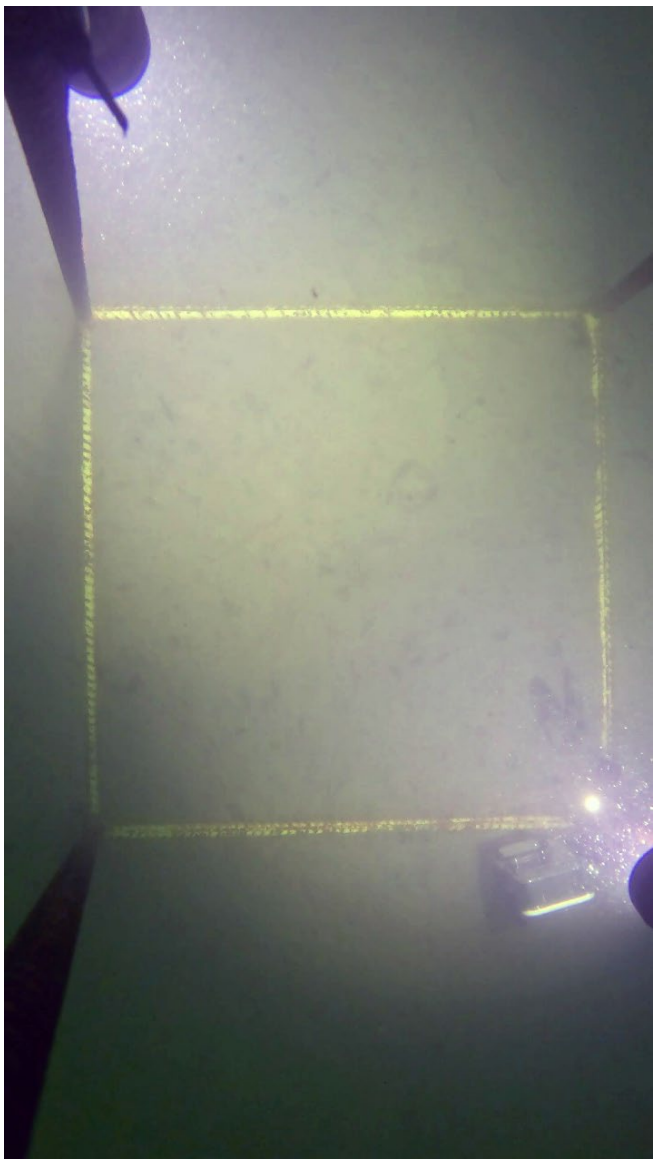
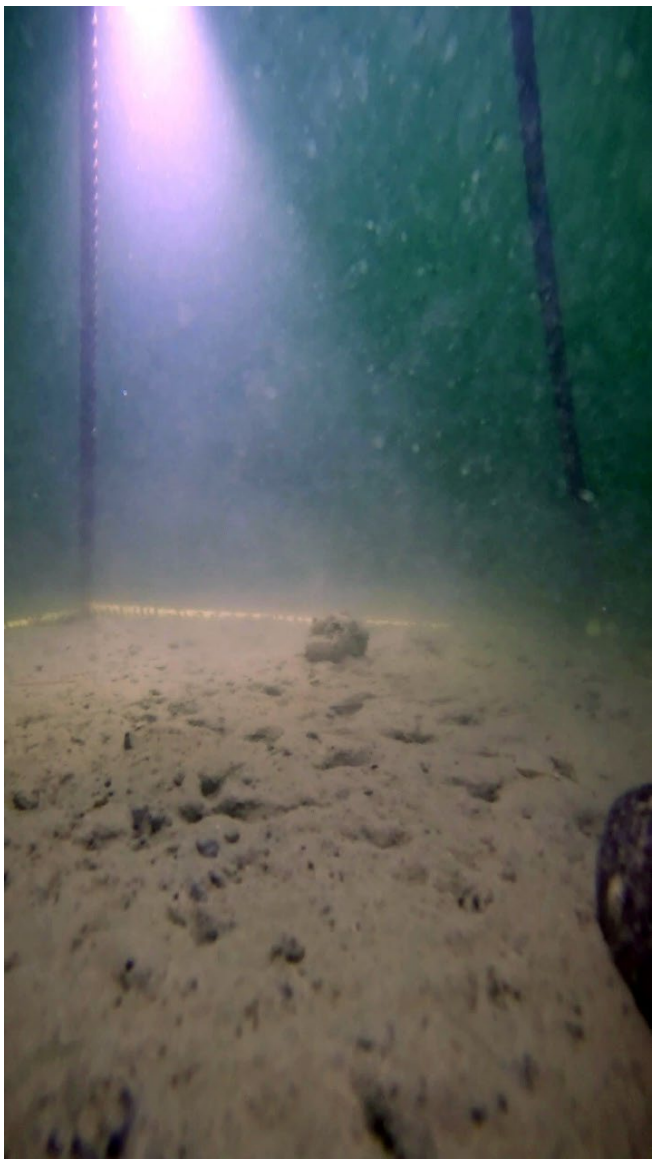
Survey Area:	***South Boston − Reserved Channel***		Station:	***SB-19***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.343415*	Longitude (NAD83): *-71.026280*	Water Depth (FT): *-38.5*		

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.

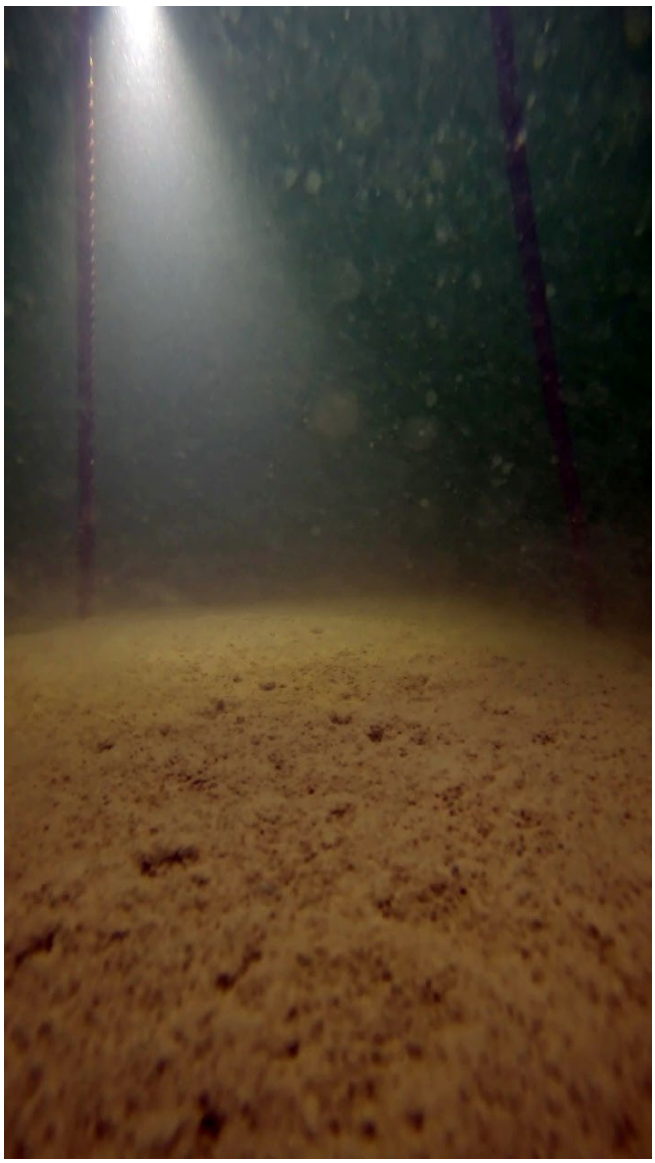
Survey Area:	***South Boston − Reserved Channel***		Station:	***SB-20***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.343800*	Longitude (NAD83): *-71.021748*	Water Depth (FT): *-38.7*		

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.

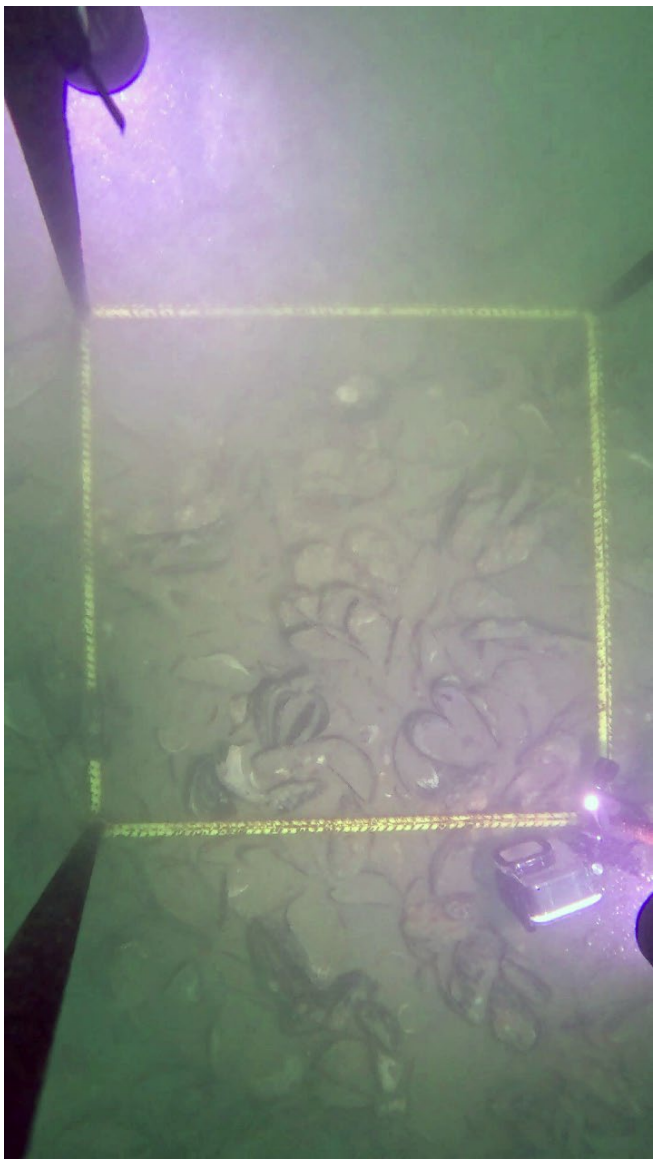
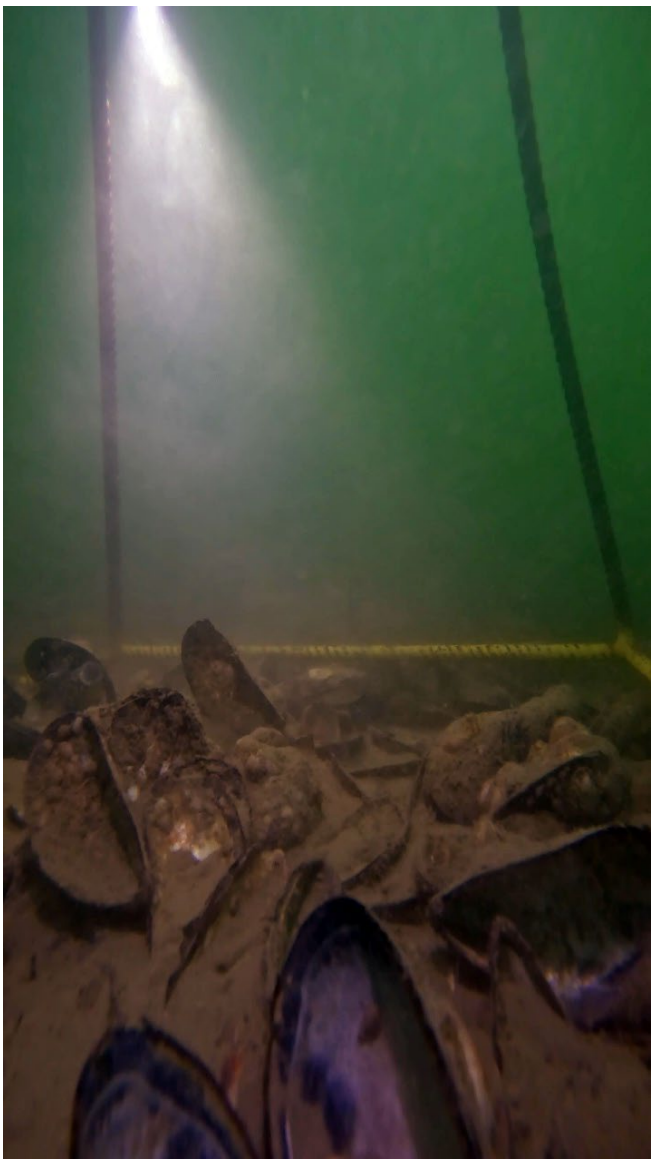
Survey Area:	***South Boston – Dry Dock***		Station:	***SB-21***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.345240*	Longitude (NAD83): *-71.024321*	Water Depth (FT): *-41.2*		

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.

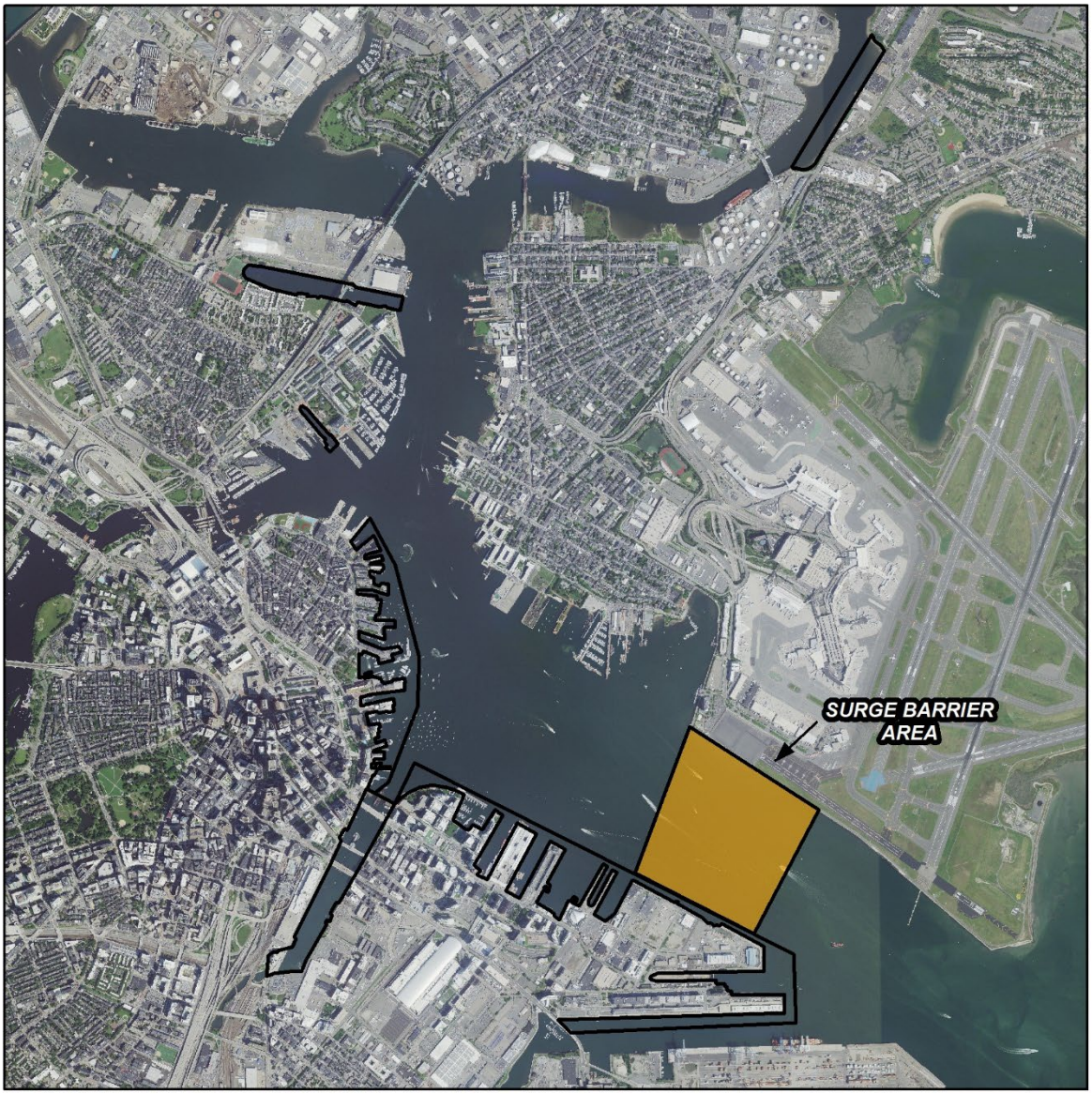
Survey Area:	***South Boston – Dry Dock***		Station:	***SB-22***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.346222*	Longitude (NAD83): *-71.023109*	Water Depth (FT): *-27.3*		

Plan View	Profile View
	

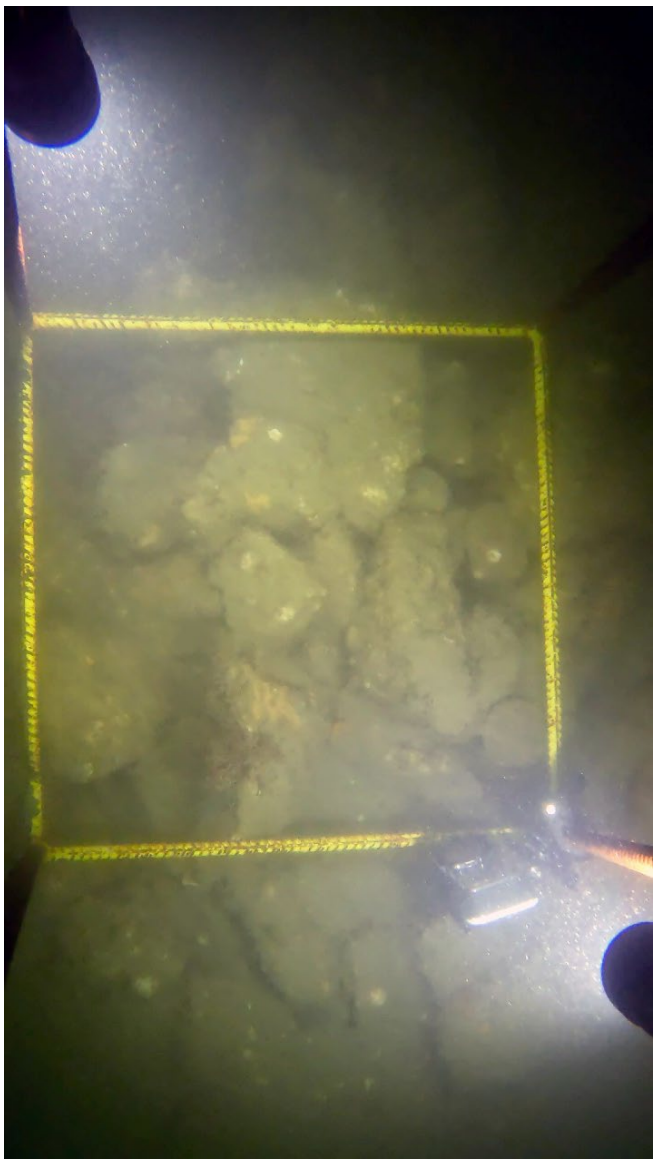
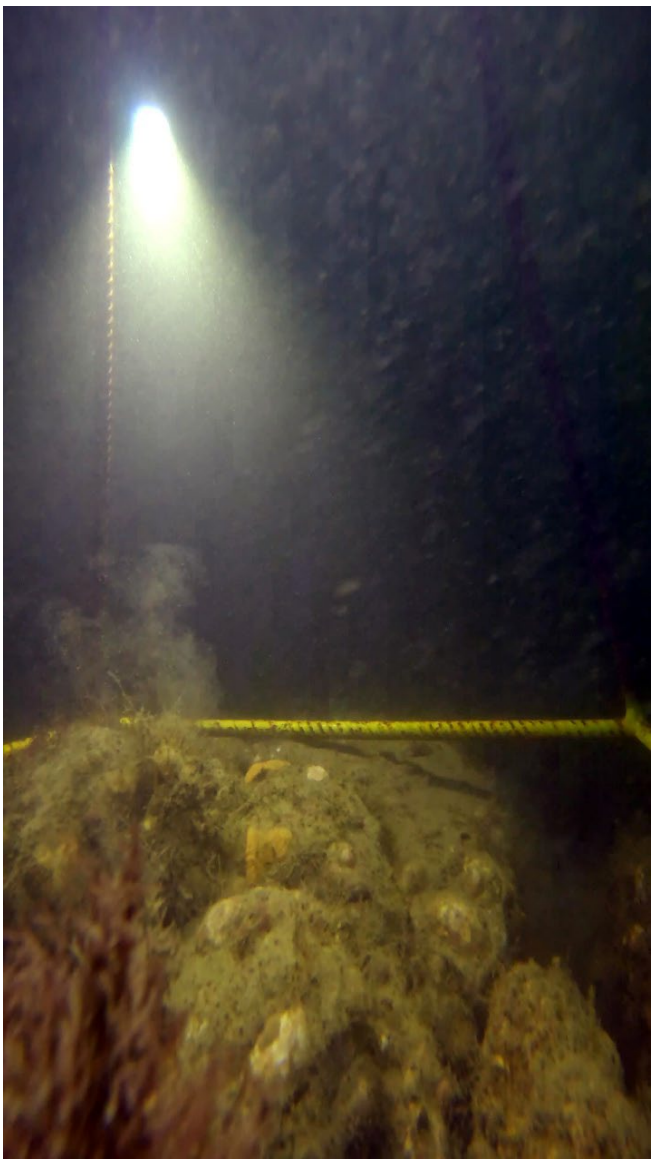
Notes:

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

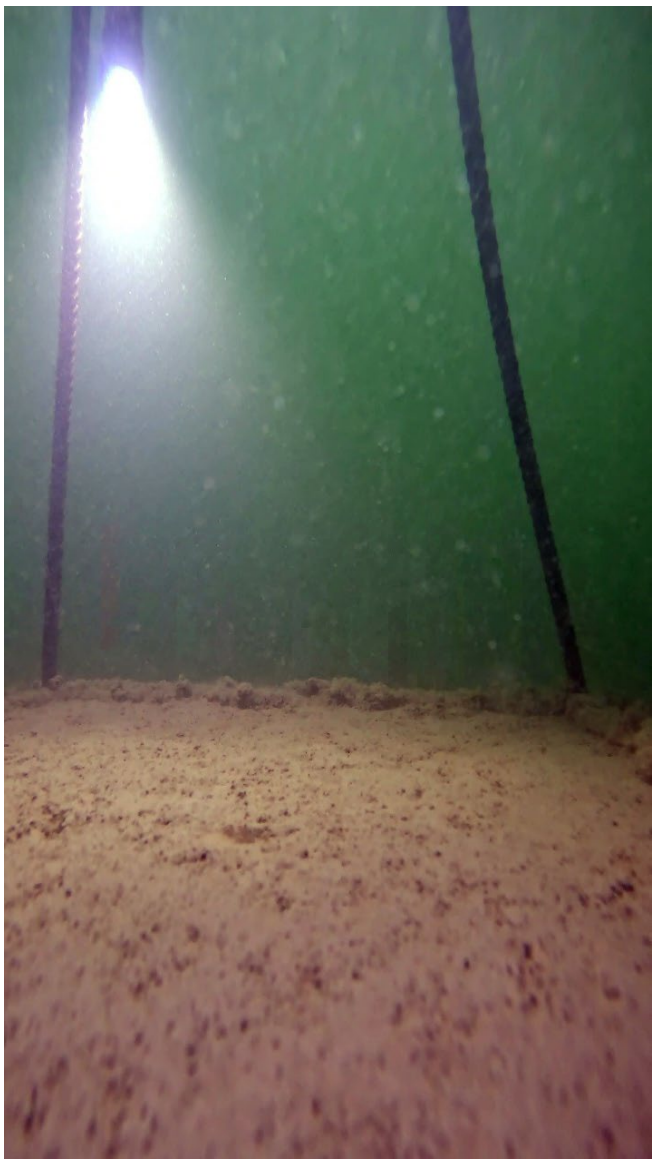


Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-1***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355373*	Longitude (NAD83): *-71.027333*	Water Depth (FT): *-36.5*		

Plan View	Profile View
	

Notes:

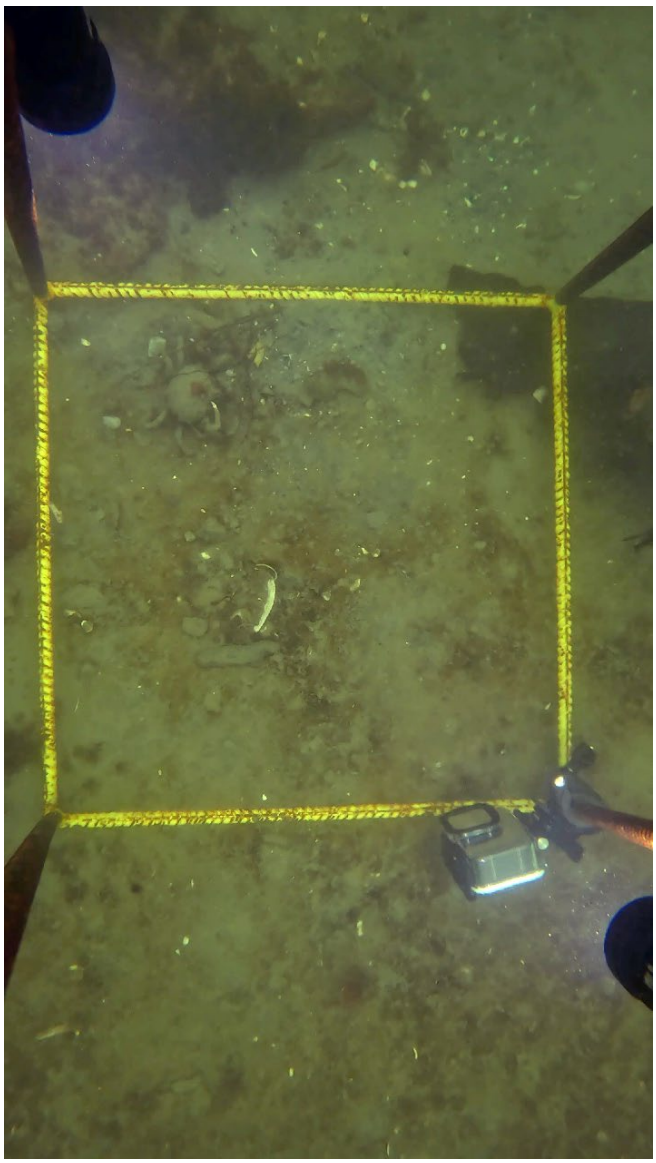
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-2***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355100*	Longitude (NAD83): *-71.025412*	Water Depth (FT): *-30.4*		

Plan View	Profile View
	

Notes:

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

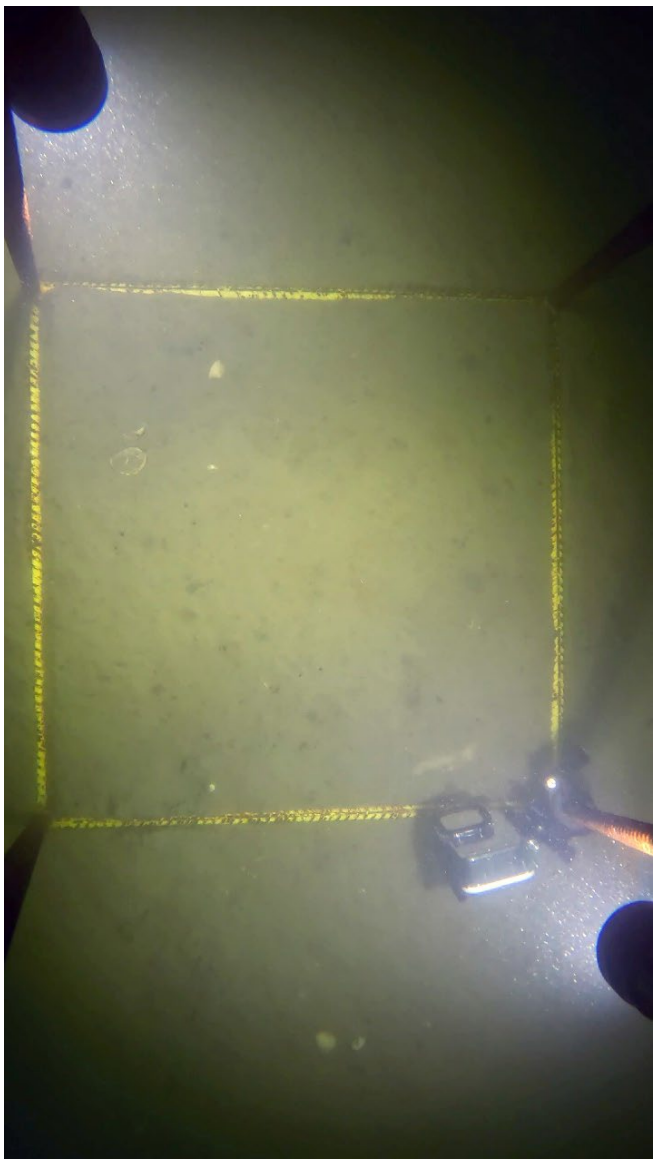
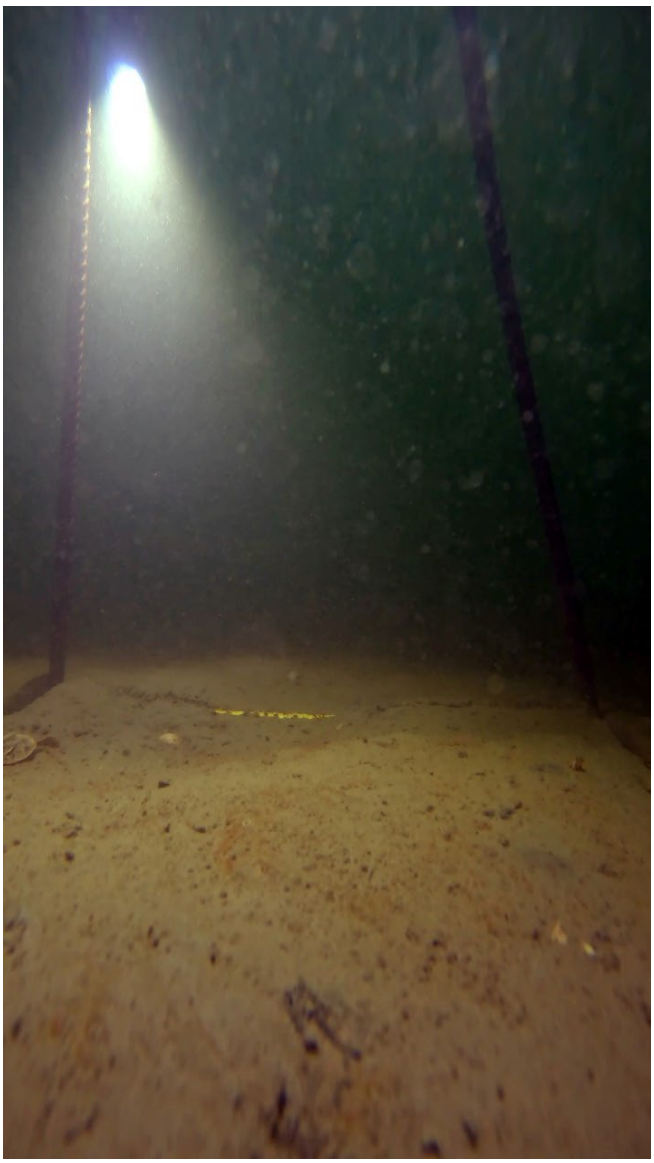
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-3***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355750*	Longitude (NAD83): *-71.024199*	Water Depth (FT): *-6.3*		

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.

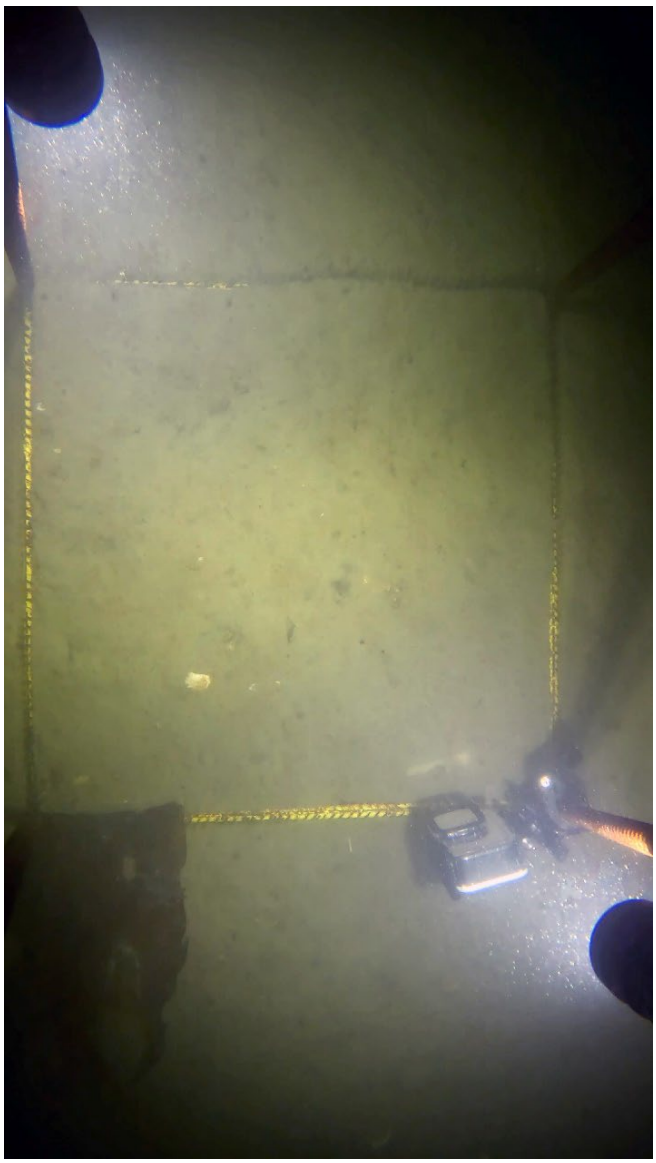
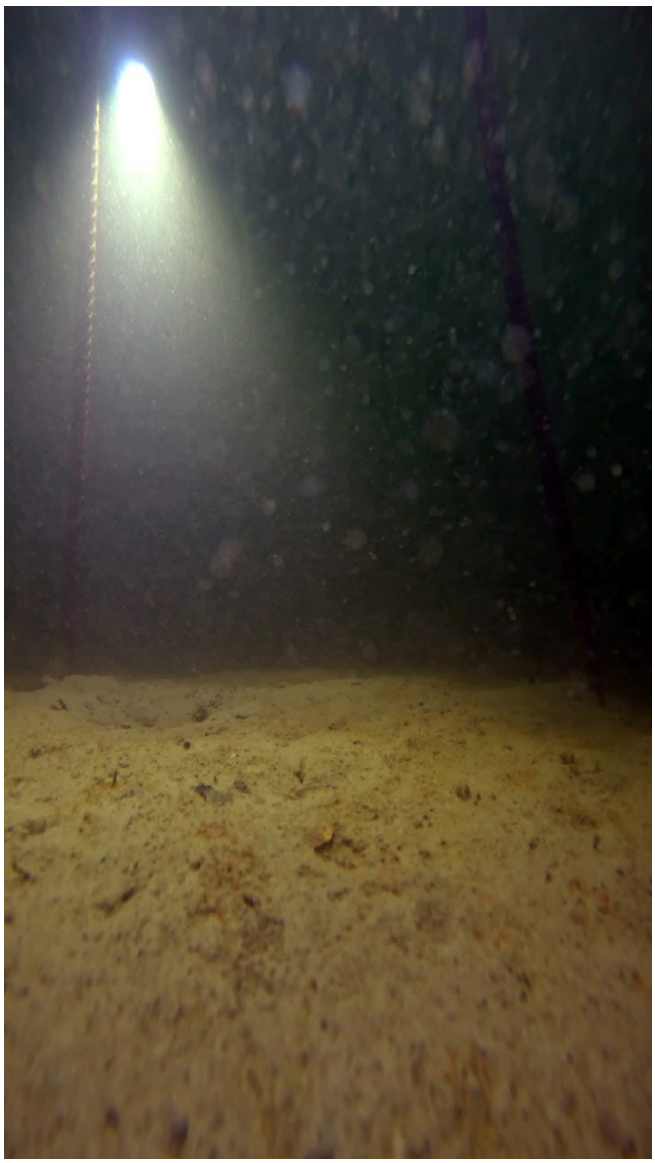
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-4***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.354030*	Longitude (NAD83): *-71.028310*	Water Depth (FT): *-38.3*		

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.

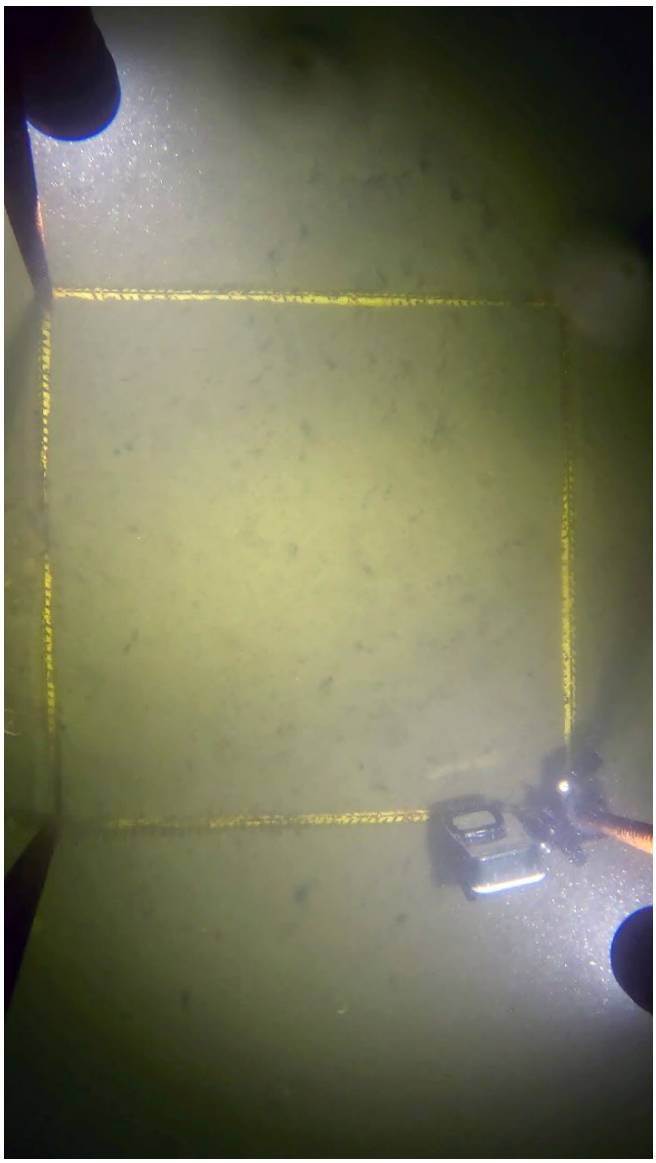
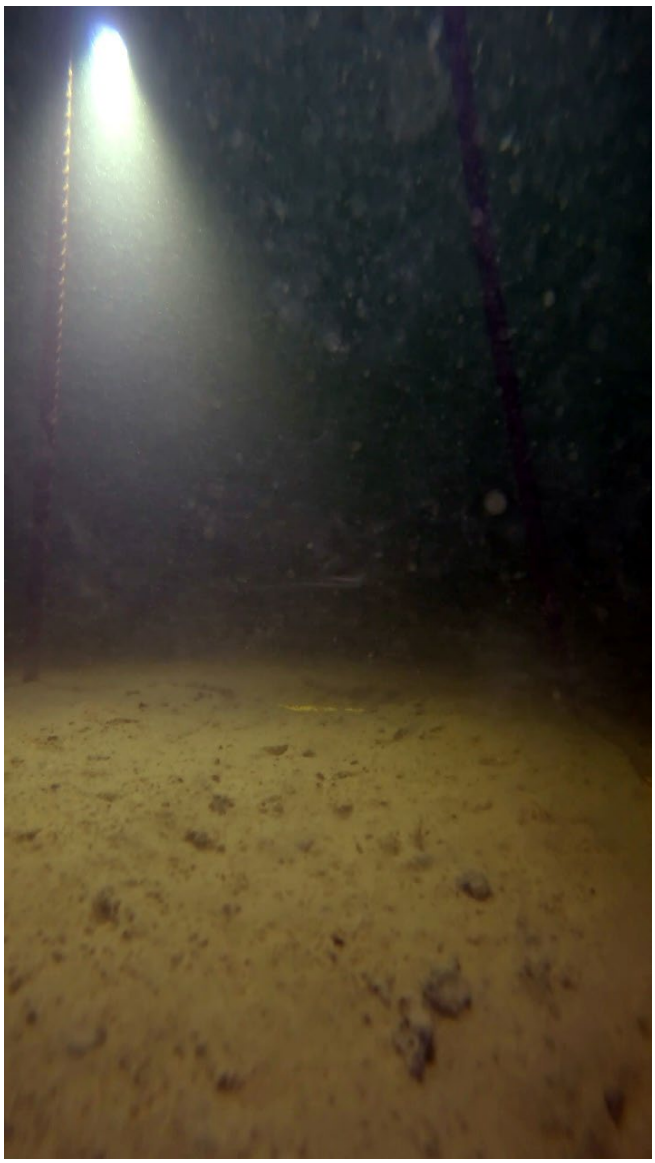
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-5***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.351979*	Longitude (NAD83): *-71.029603*	Water Depth (FT): *-45.2*		

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.

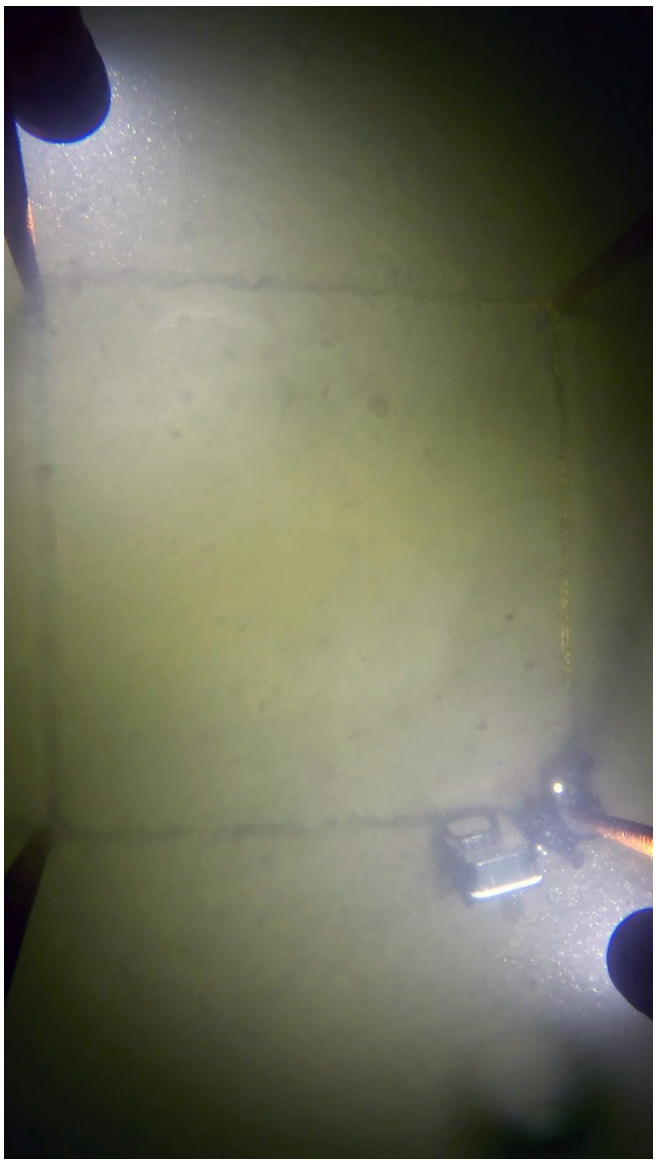
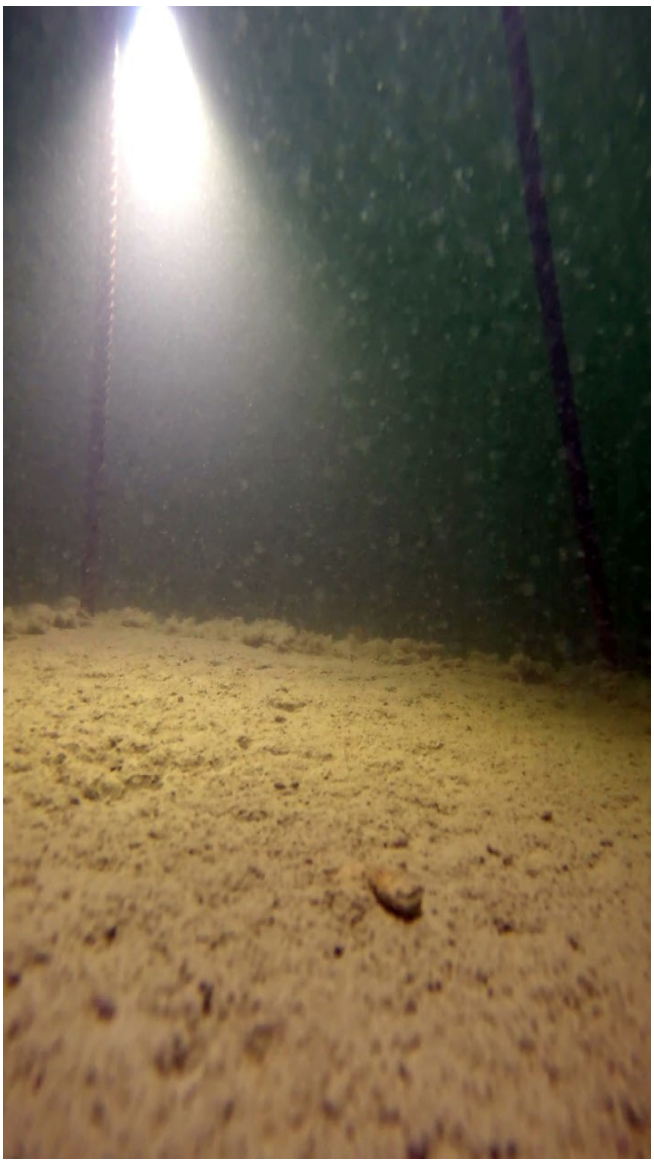
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-6-2***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350961*	Longitude (NAD83): *-71.030649*	Water Depth (FT): *-37.7*		

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).

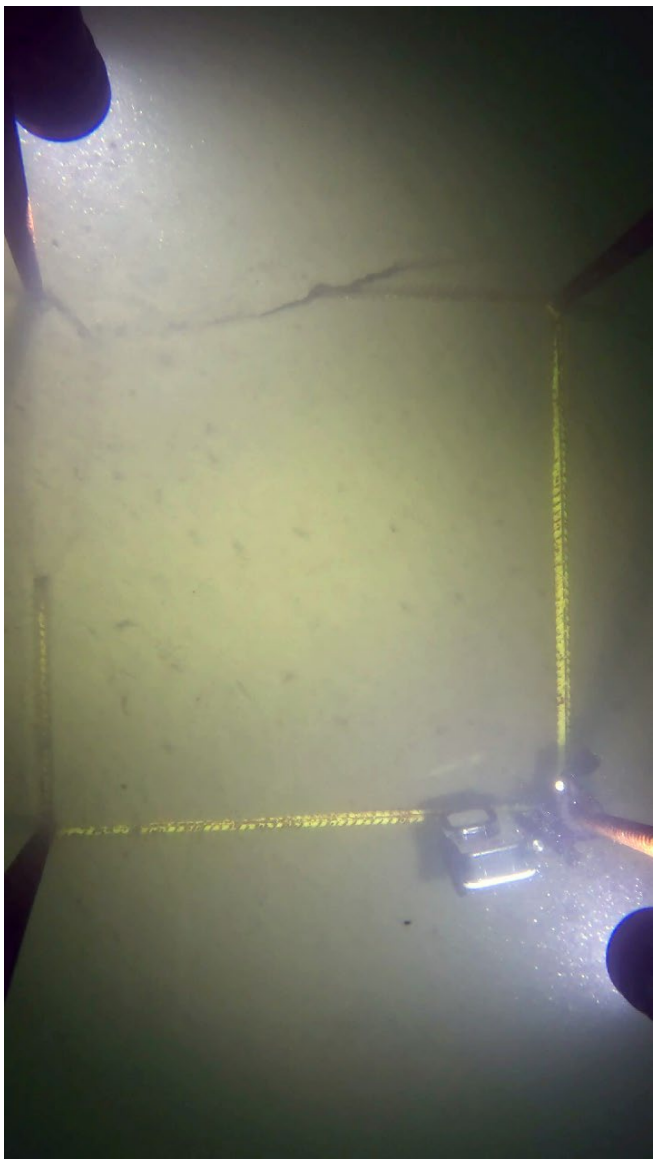
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-7***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350306*	Longitude (NAD83): *-71.027155*	Water Depth (FT): *-42.6*		

Plan View	Profile View
	

Notes:

Bare silt with small infaunal invertebrate tubes and burrows. Located within the 40-foot Main Ship Channel.

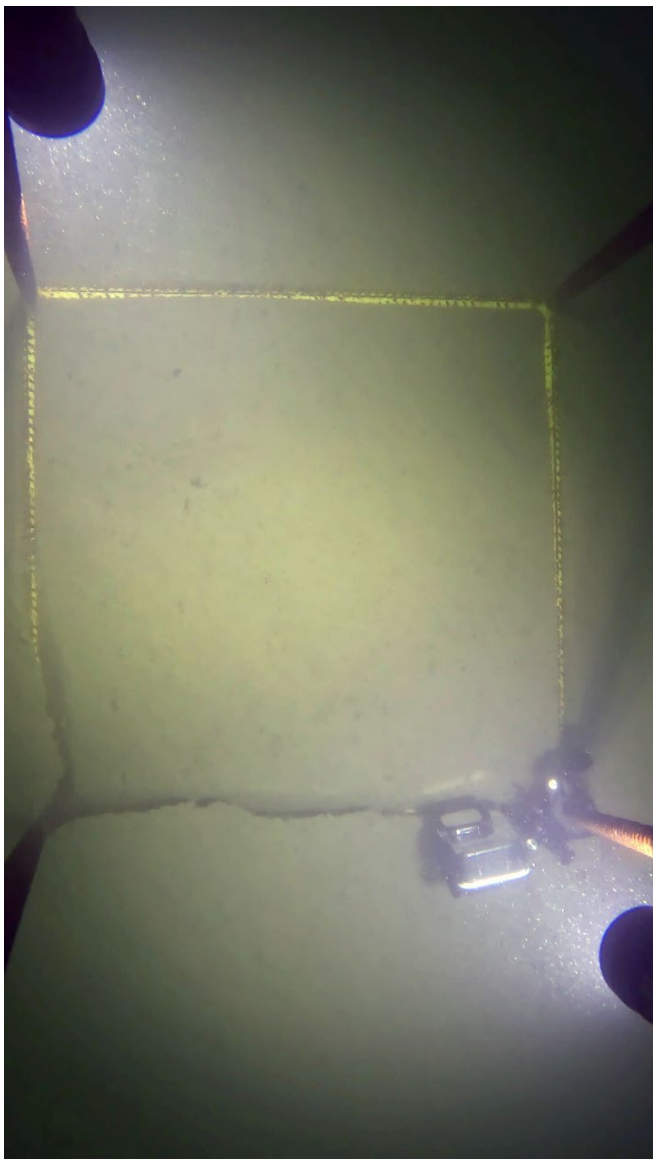
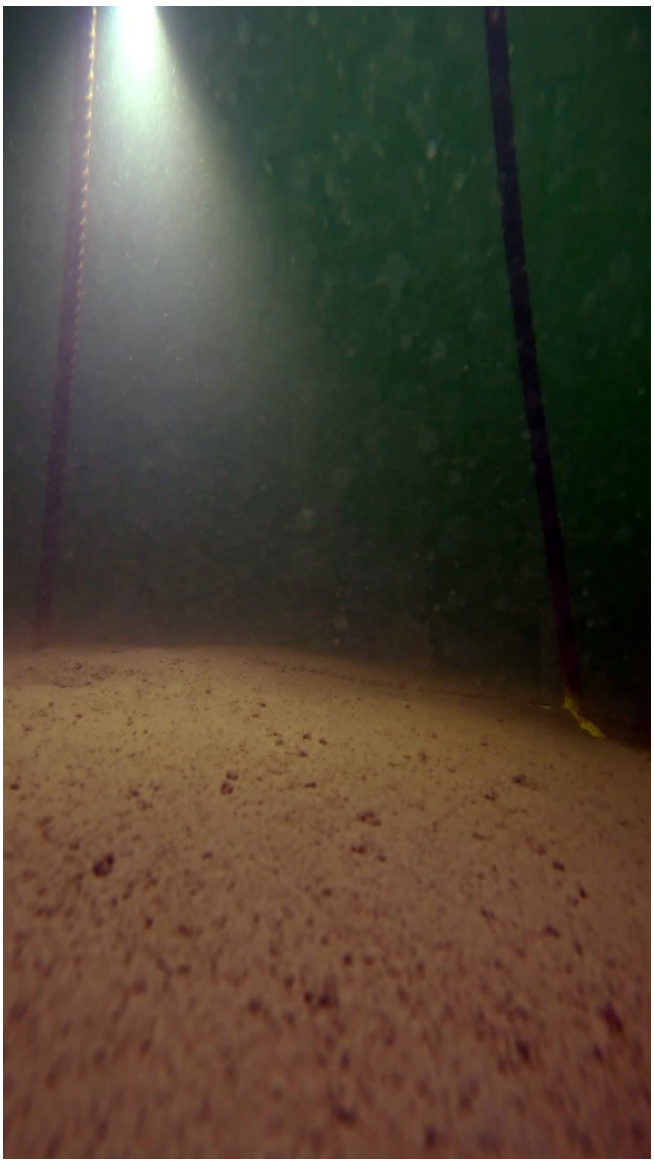
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-8***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350985*	Longitude (NAD83): *-71.024721*	Water Depth (FT): *-38.2*		

Plan View	Profile View
	

Notes:

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

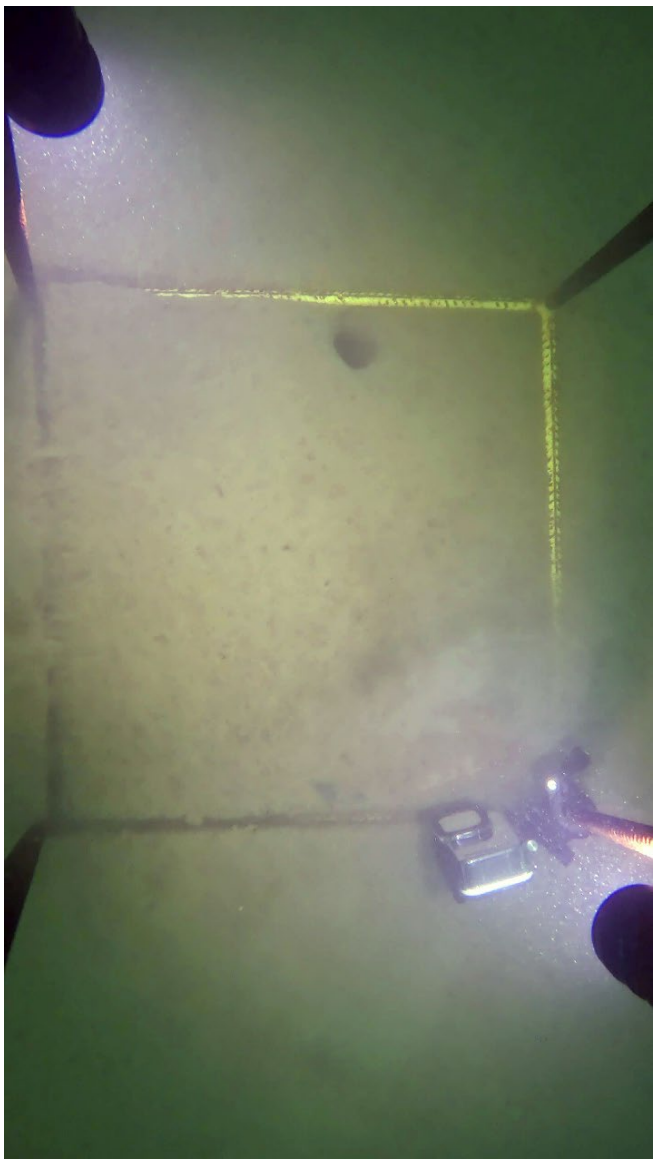
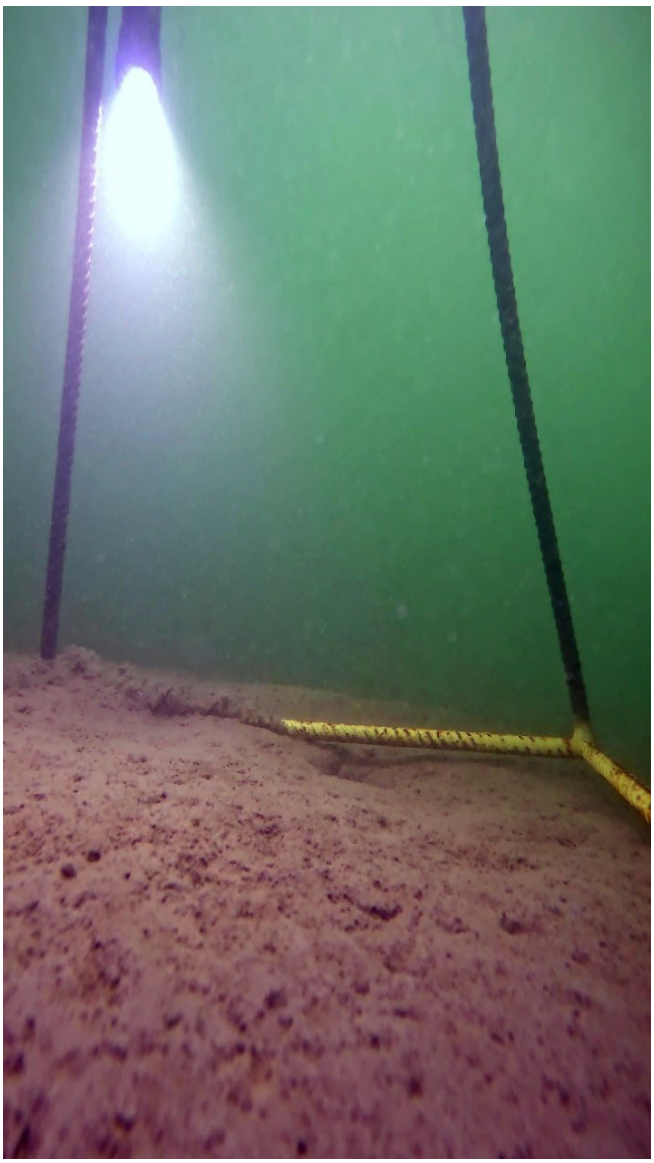
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-9***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350602*	Longitude (NAD83): *-71.024051*	Water Depth (FT): *-39.6*		

Plan View	Profile View
	

Notes:

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

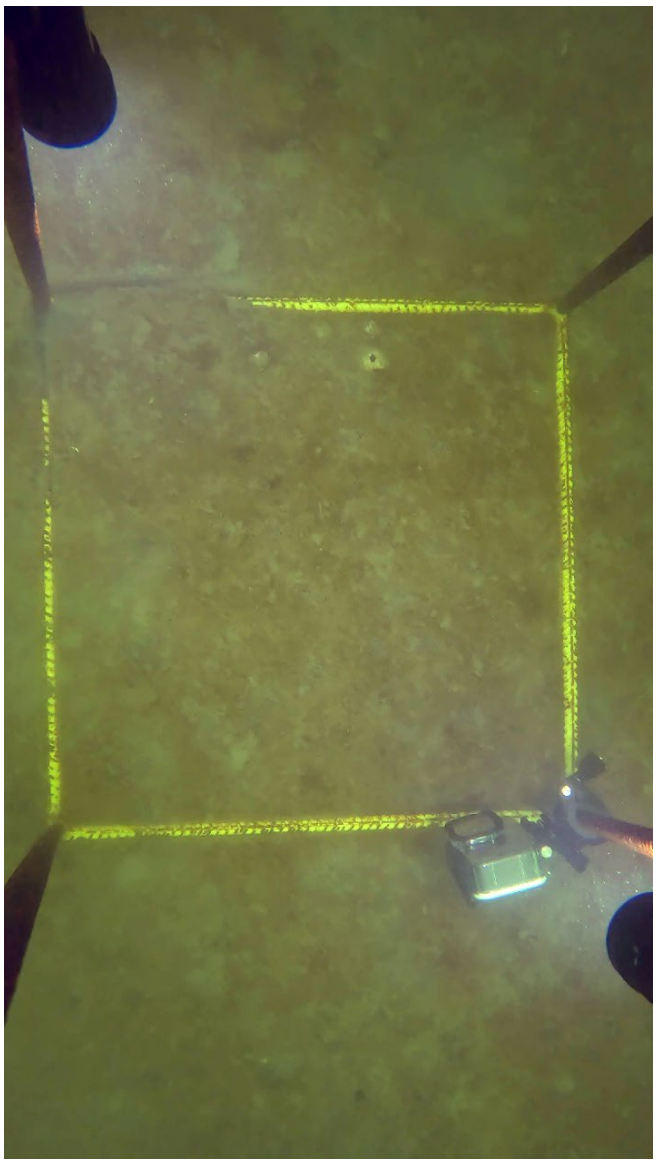
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-10***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.352380*	Longitude (NAD83): *-71.022302*	Water Depth (FT): *-28.0*		

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.

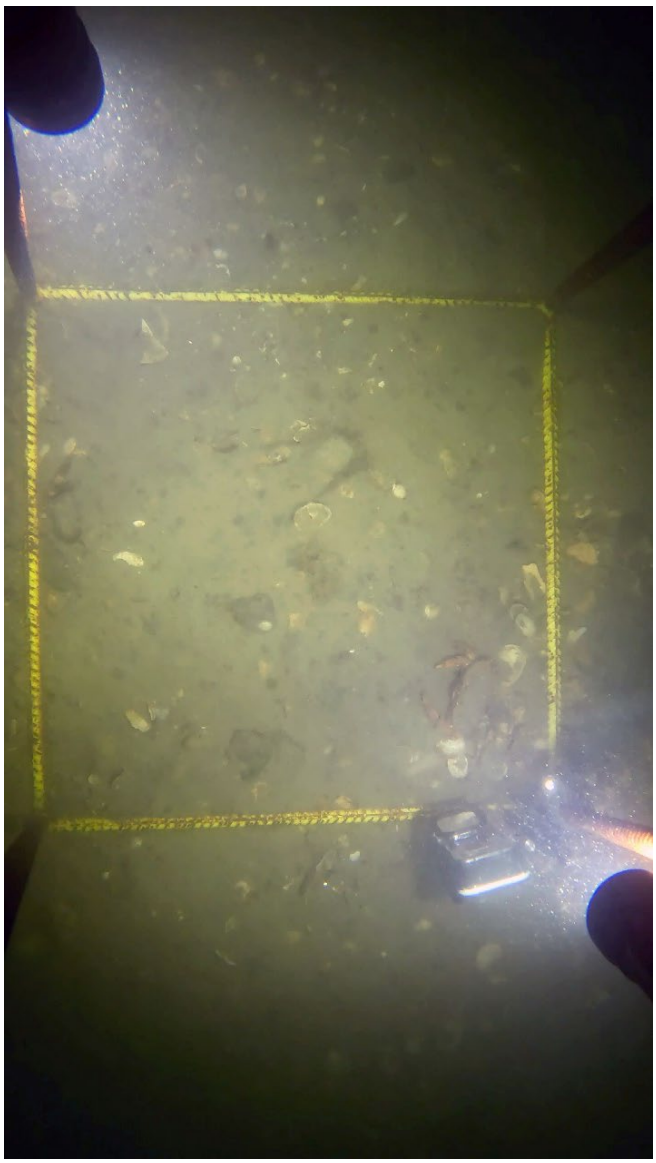
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-11***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.354132*	Longitude (NAD83): *-71.021260*	Water Depth (FT): *-15.8*		

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.

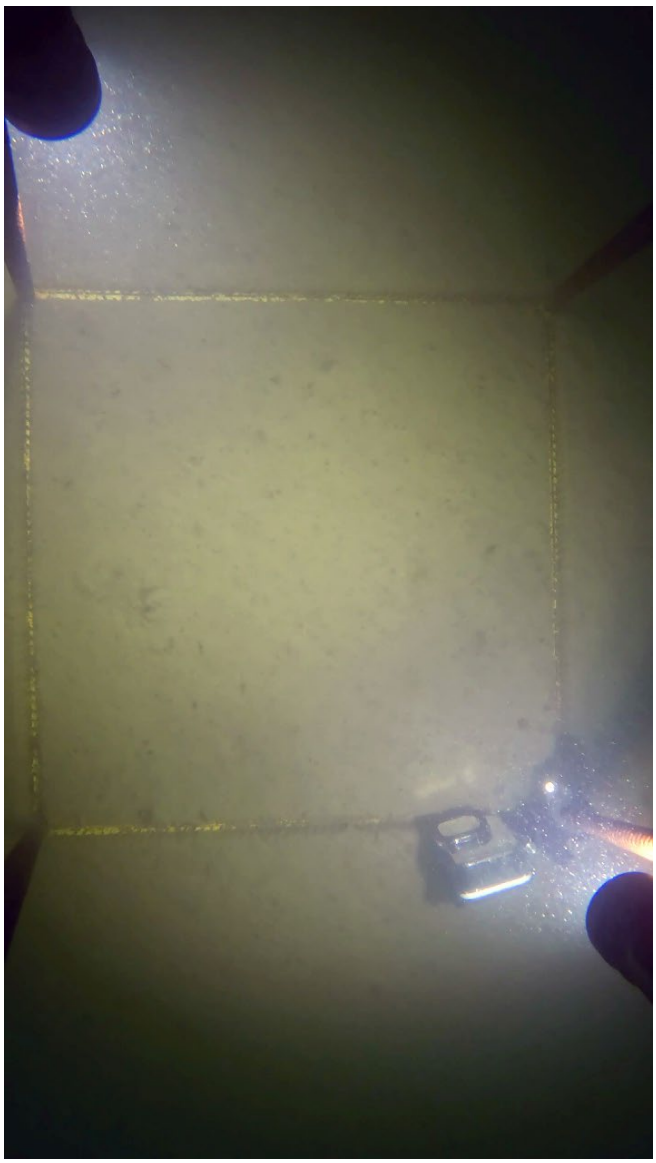
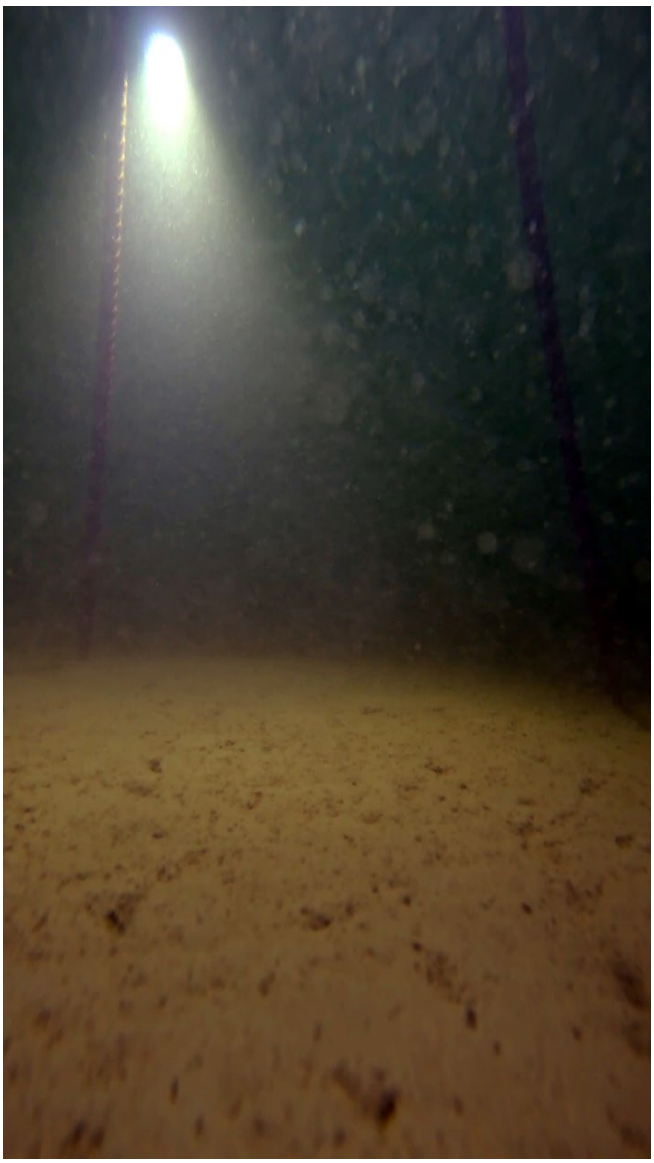
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-12***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.349222*	Longitude (NAD83): *-71.024749*	Water Depth (FT): *-44.0*		

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.

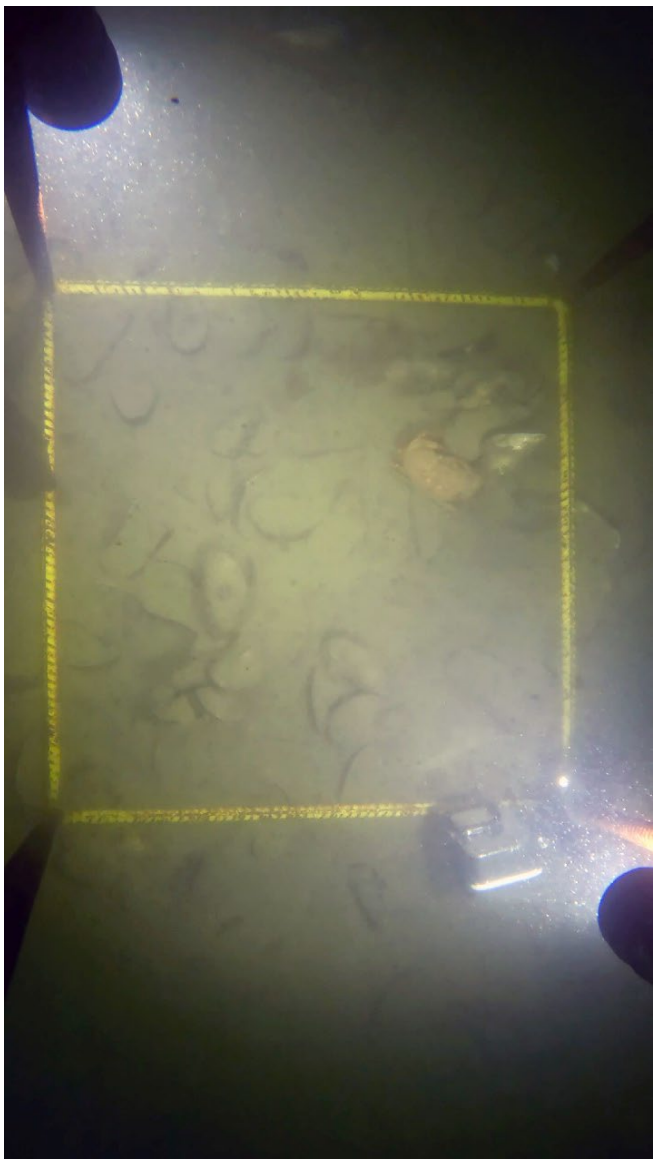
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-13***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.348040*	Longitude (NAD83): *-71.024915*	Water Depth (FT): *-42.6*		

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.

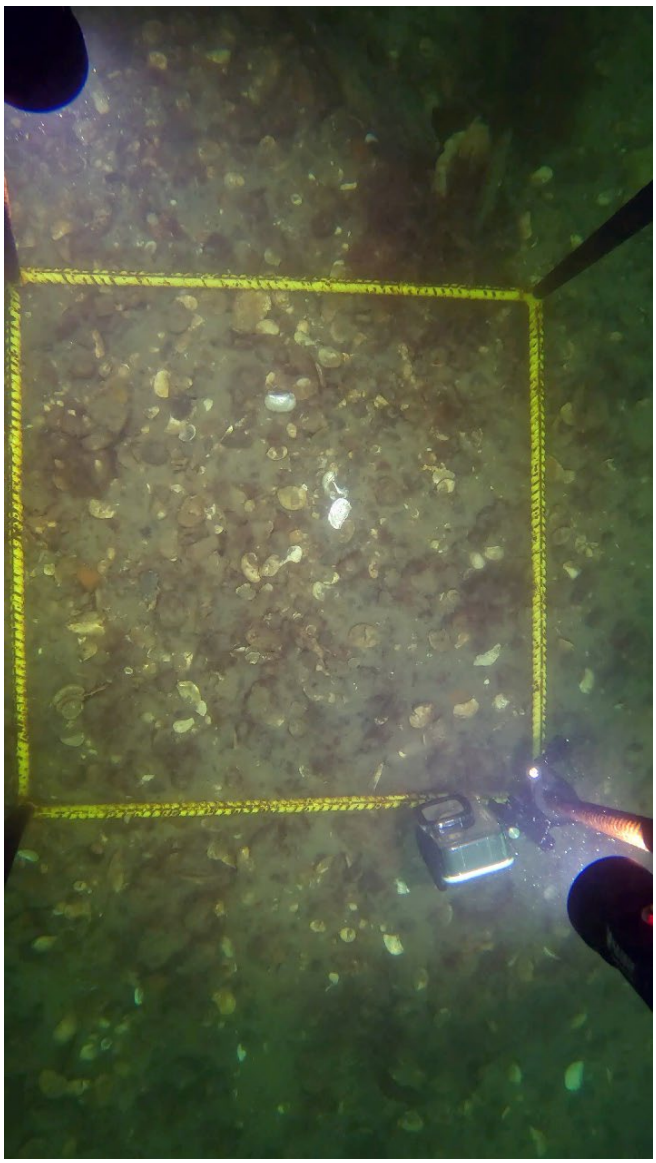
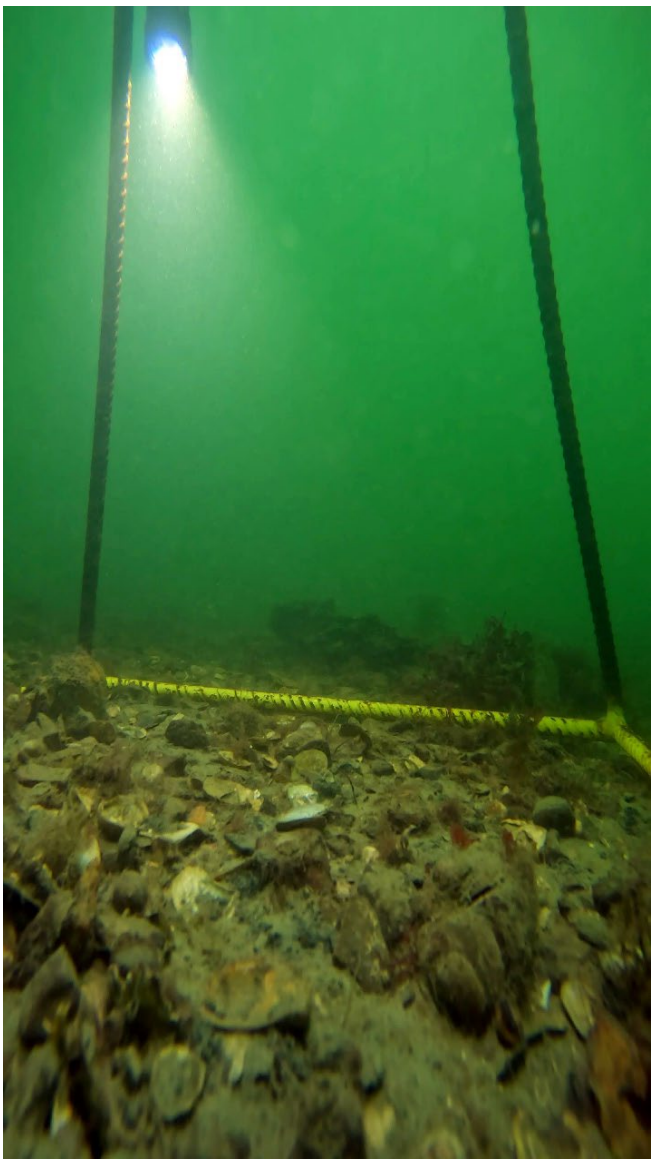
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-14***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.348037*	Longitude (NAD83): *-71.025802*	Water Depth (FT): *-32.9*		

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.

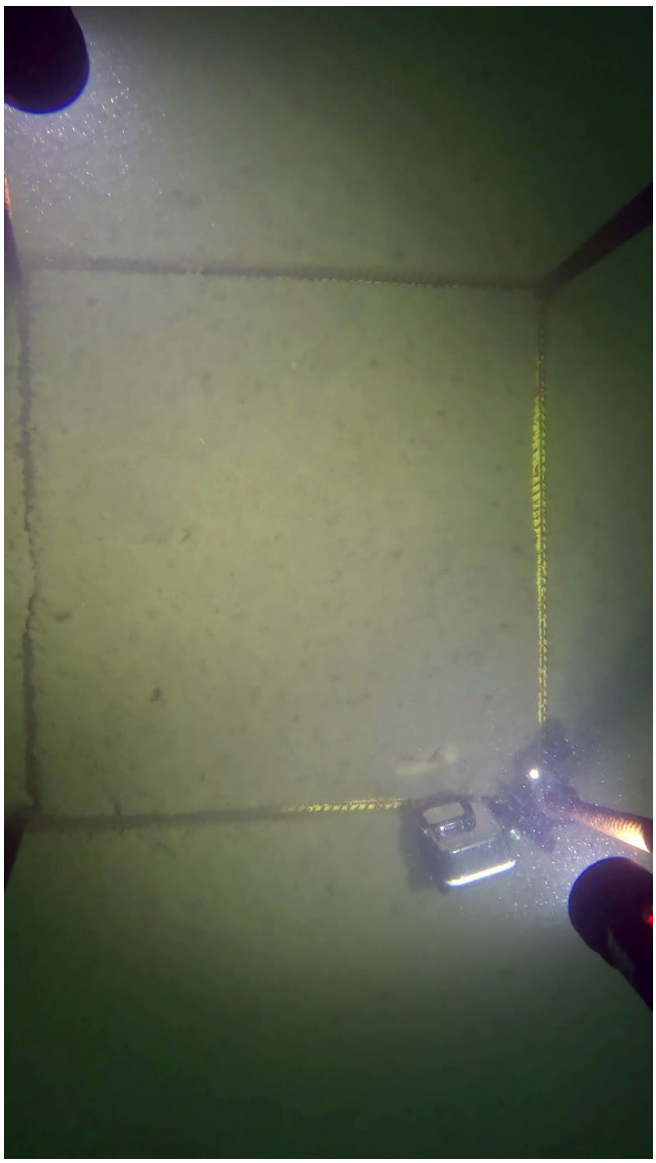
Survey Area:	***Boston Harbor Surge Barrier***		Station:	***MSC-15***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.349168*	Longitude (NAD83): *-71.028750*	Water Depth (FT): *-11.0*		

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:	***Boston Harbor Surge Barrier***		Station:	***MSC-16***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.349950*	Longitude (NAD83): *-71.029409*	Water Depth (FT): *-29.8*		

Plan View	Profile View
	

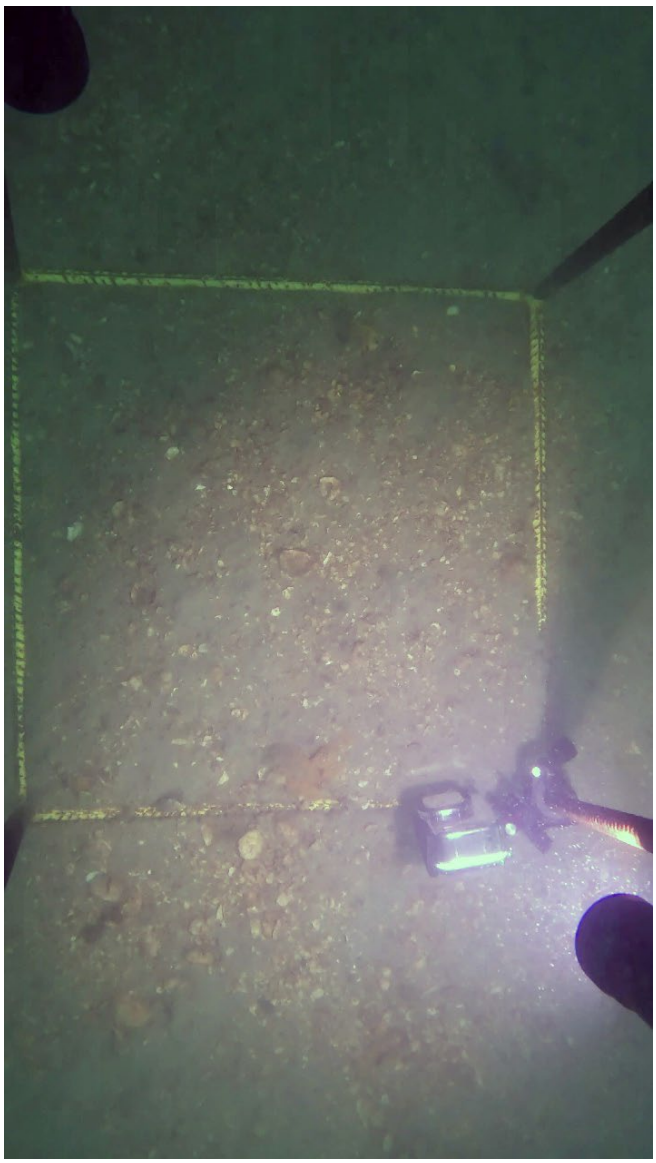
Notes:

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

Survey Area:	***Boston Harbor Surge Barrier***	Station:	***MSC-17***

Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*

Latitude (NAD83): *42.350495*	Longitude (NAD83): *-71.031262*	Water Depth (FT): *-28.0*

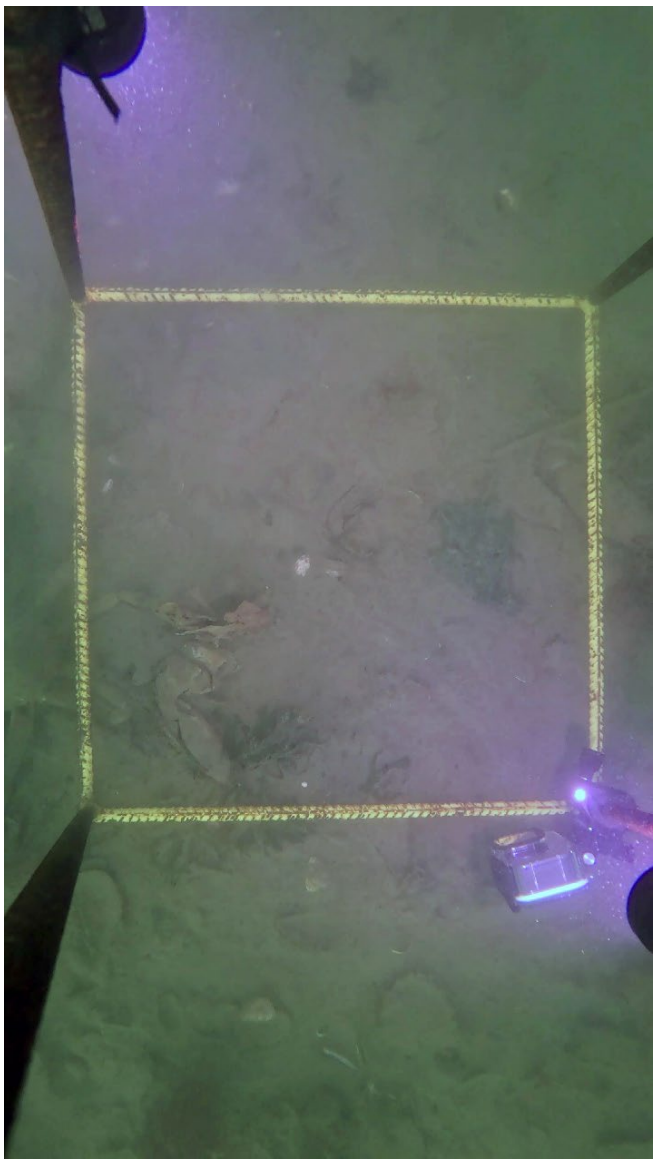
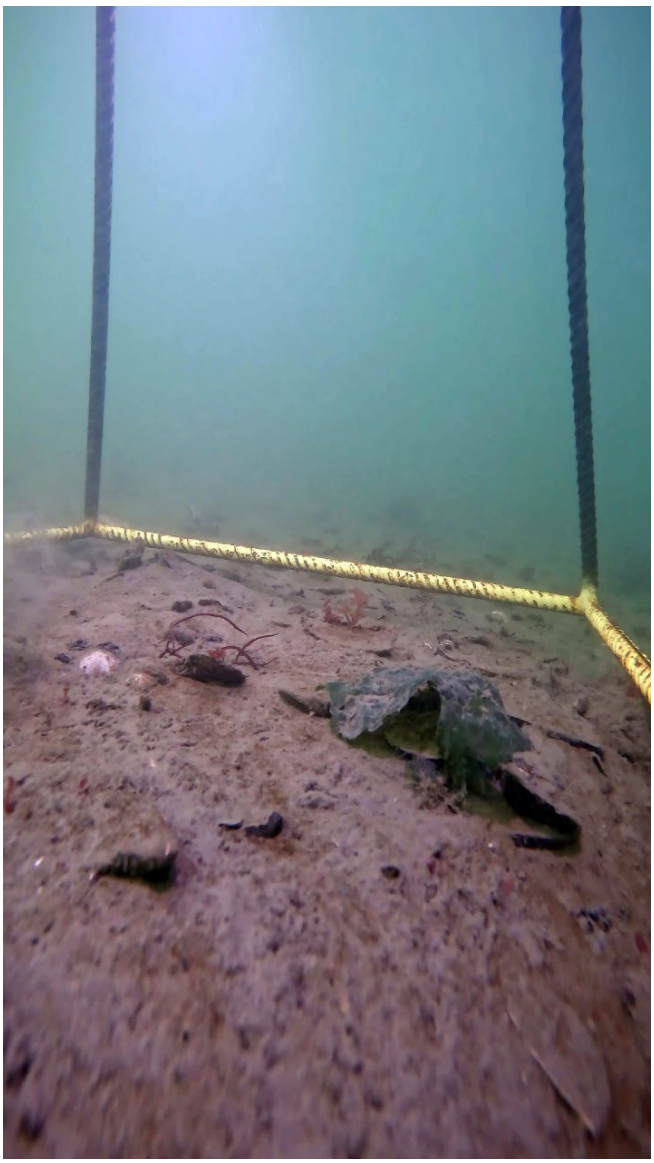
Plan View	Profile View
	

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

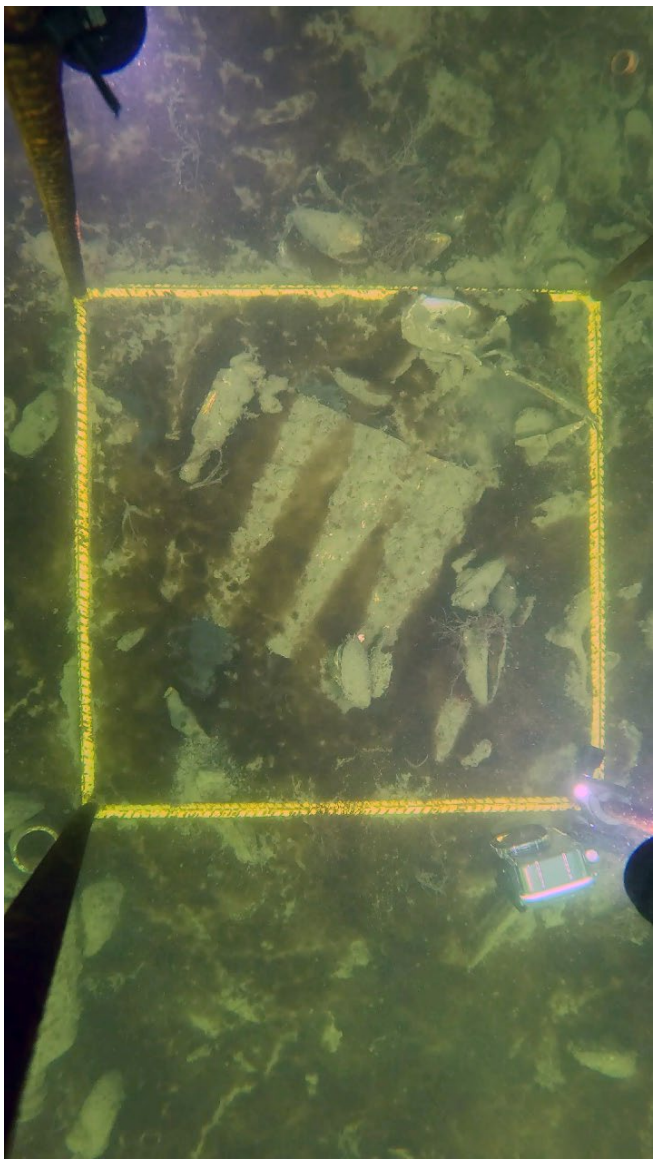
Survey Area:	***Fort Point Channel***		Station:	***FP-1***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.354713*	Longitude (NAD83): *-71.049691*	Water Depth (FT): *-18.0*		

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

Plan View	Profile View
	

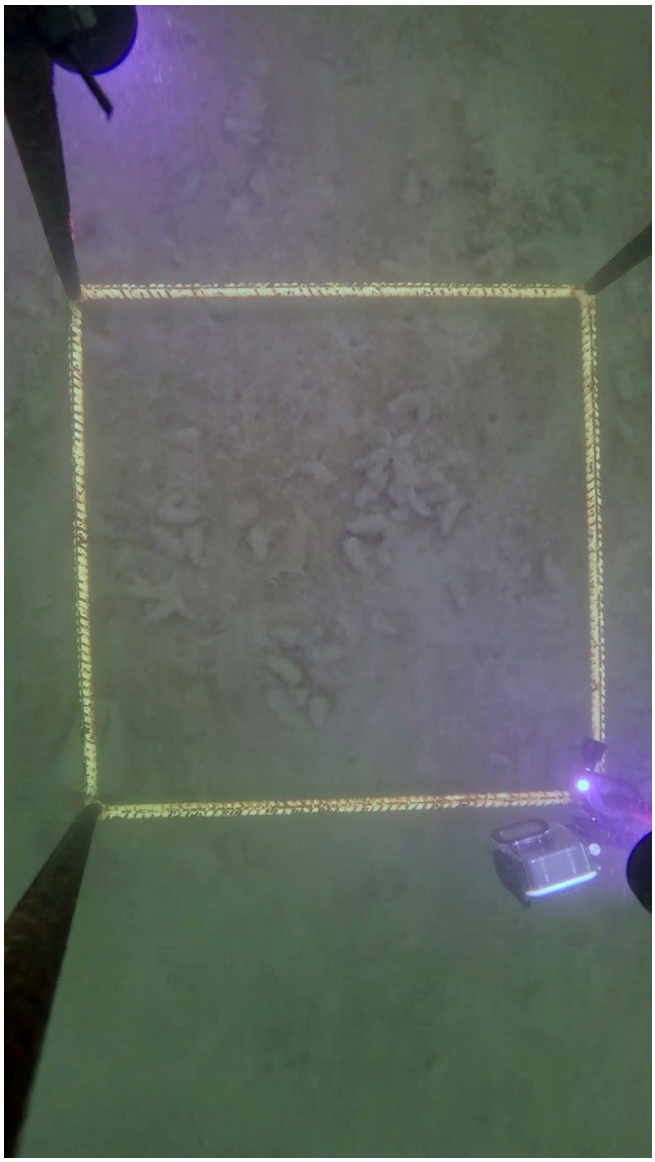
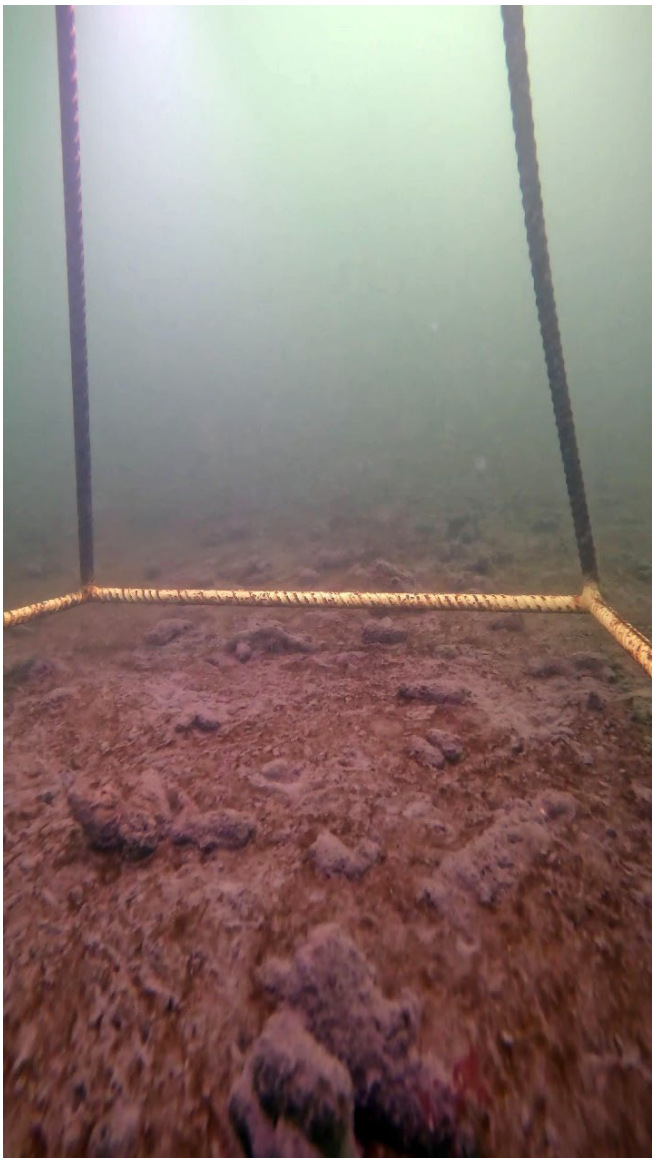
Notes:

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
	

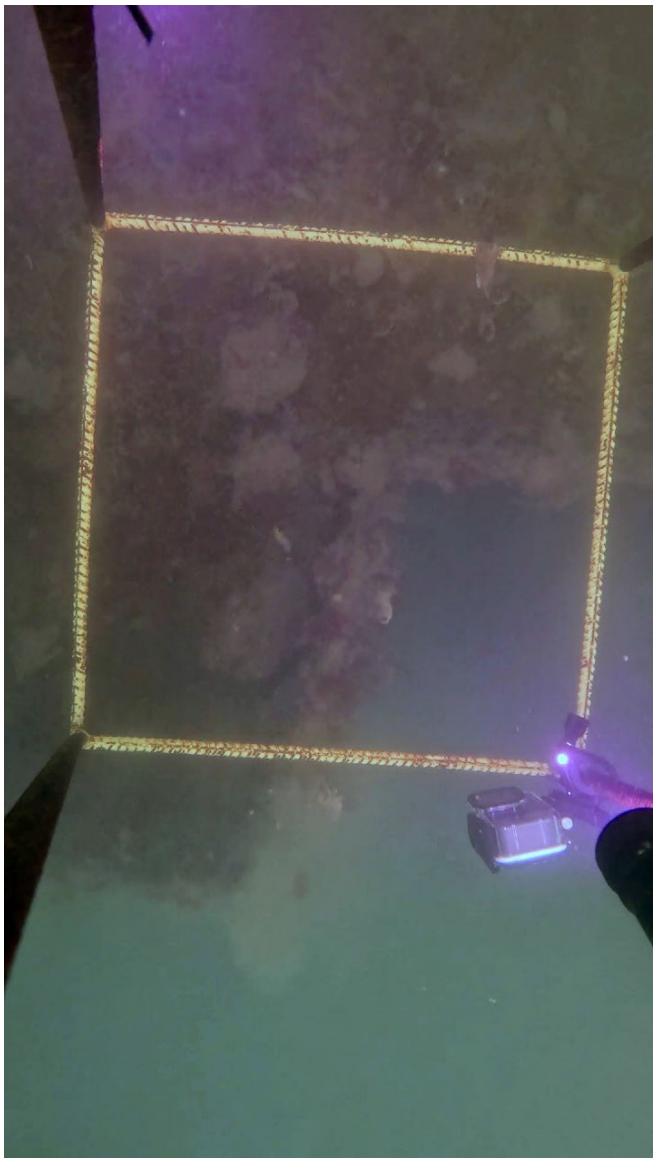
Notes:

MBTA tunnel surface silt with a thin microbial algal mat and moderate density of tunicates (likely Molgulidae sp., Styaela clava, or Ascidiella 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
	

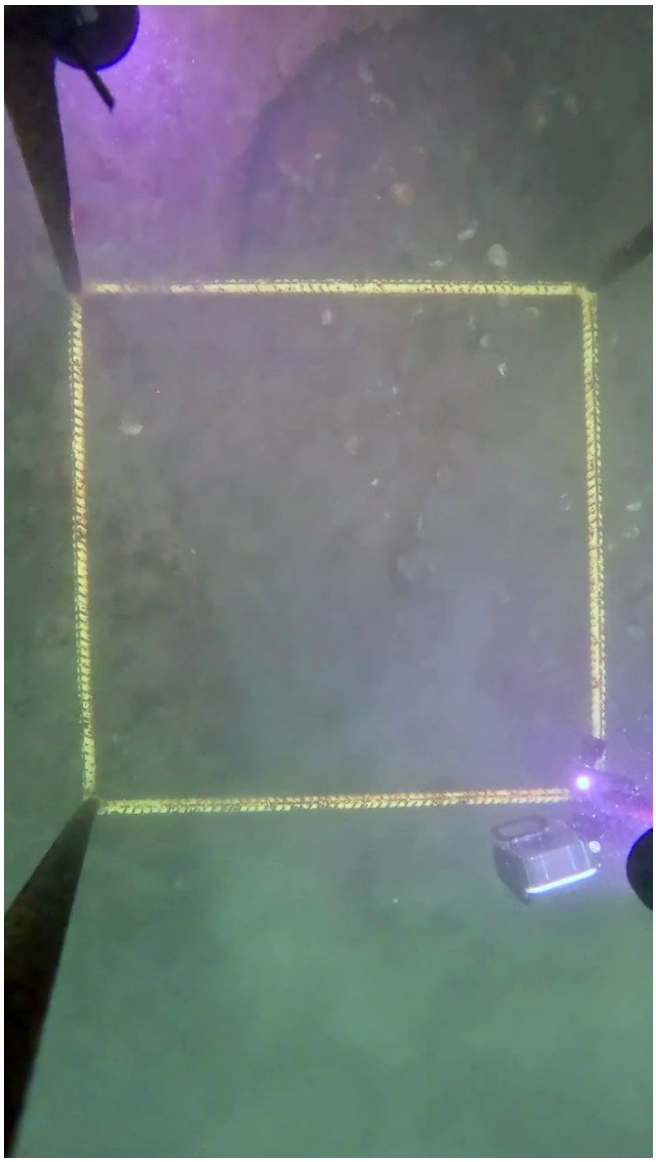
Notes:

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*

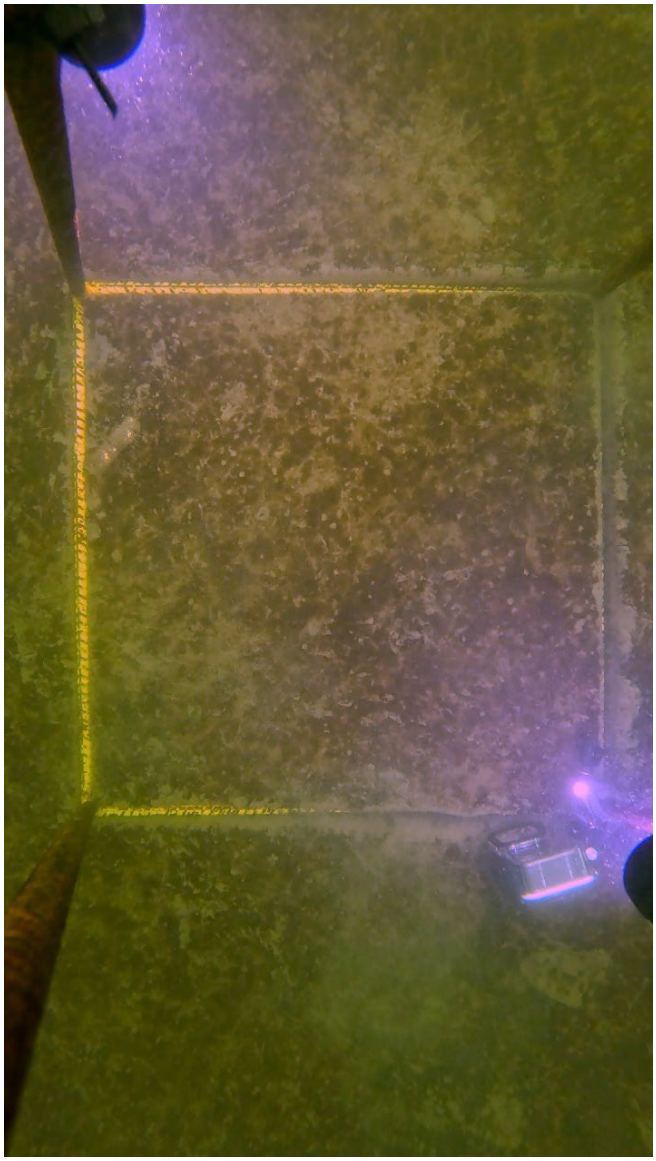
Start Coordinates (NAD83): *42.353388, -71.050851*	Stop Coordinates (NAD83): *42.353139, -71.050924*	Water Depth (FT): *-17.9*

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.

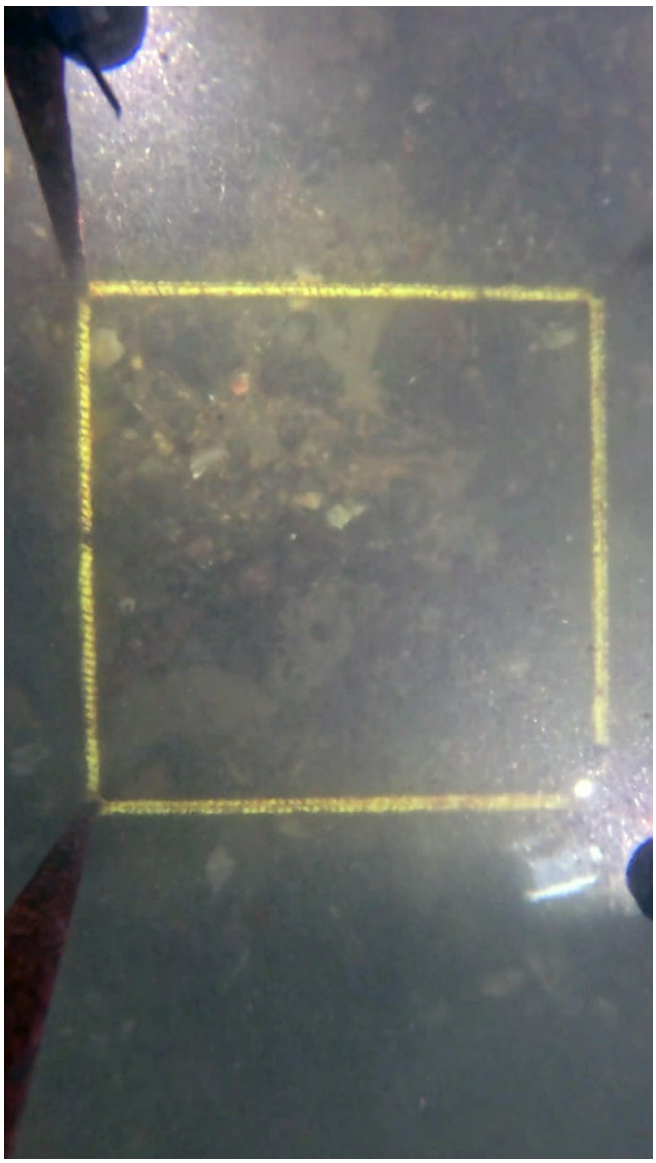
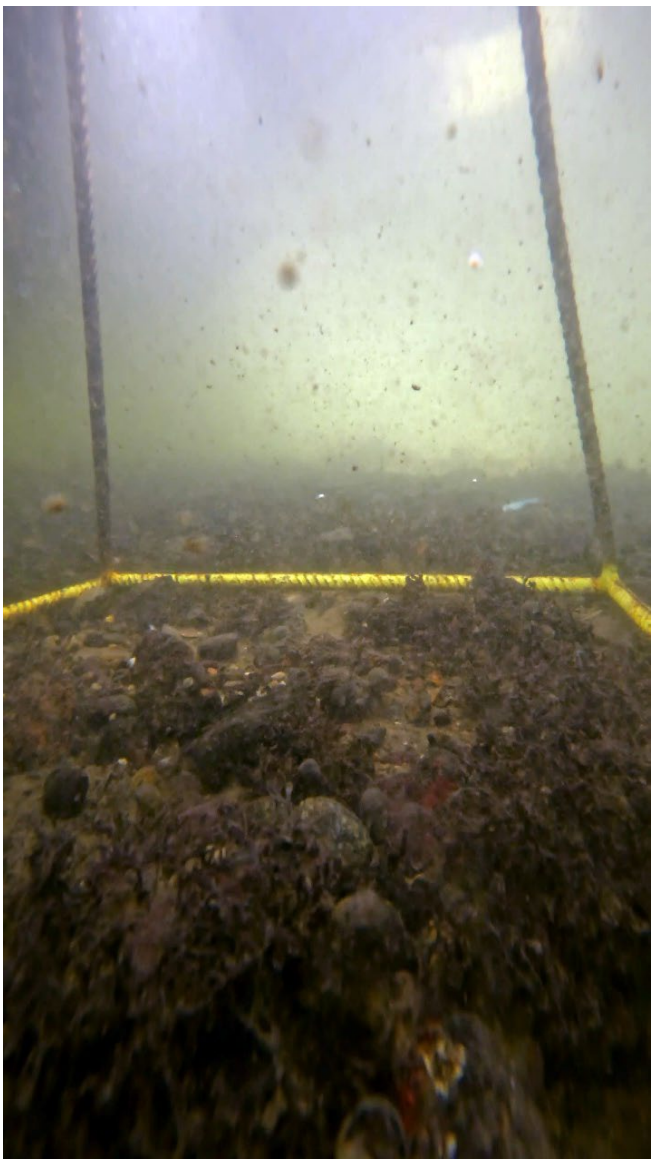
Survey Area:	***Fort Point Channel***		Station:	***FP-4***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.352721*	Longitude (NAD83): *-71.051285*	Water Depth (FT): *-16.5*		

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:	***Fort Point Channel***		Station:	***FP-5***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.351813*	Longitude (NAD83): *-71.052293*	Water Depth (FT): *-5.8*		

Plan View	Profile View
	

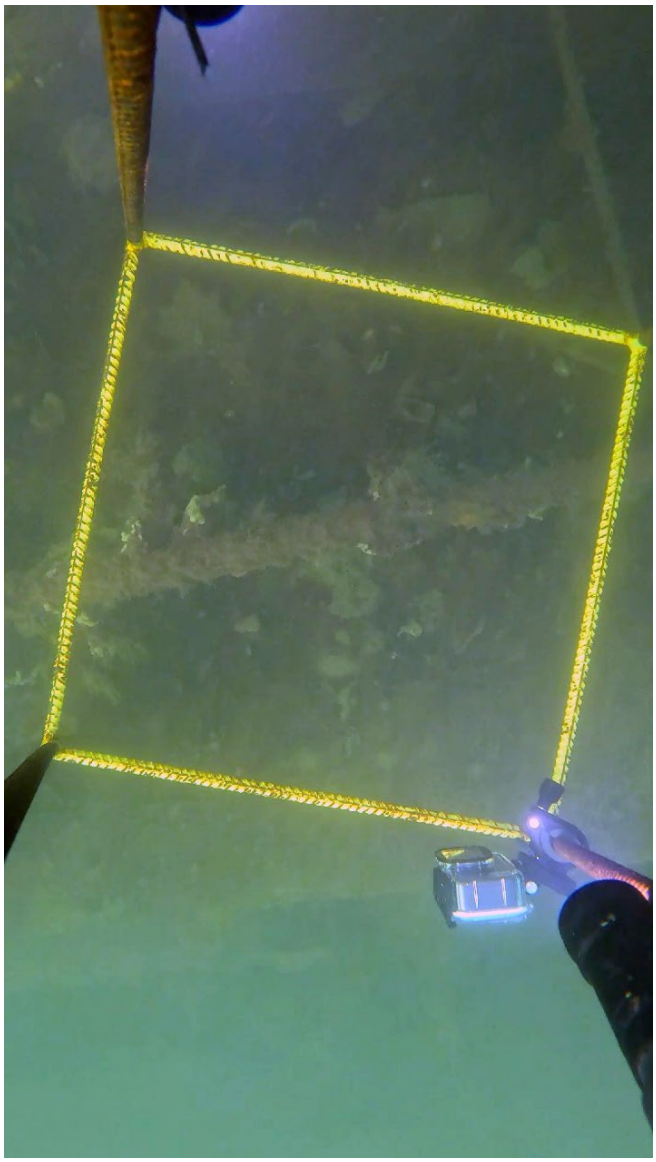
Notes:

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): *42.350197, -71.052903*	Stop Coordinates (NAD83): *42.350126, -71.052902*	Water Depth (FT): *-11.4*

Plan View	Profile View
	

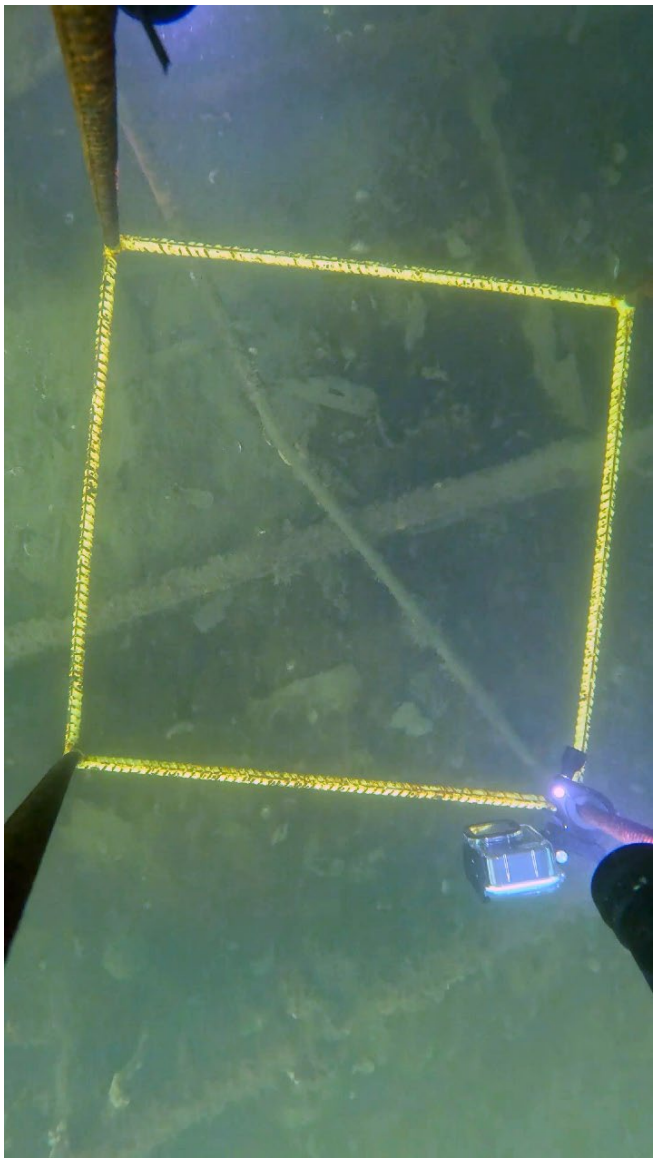
Notes:

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
	

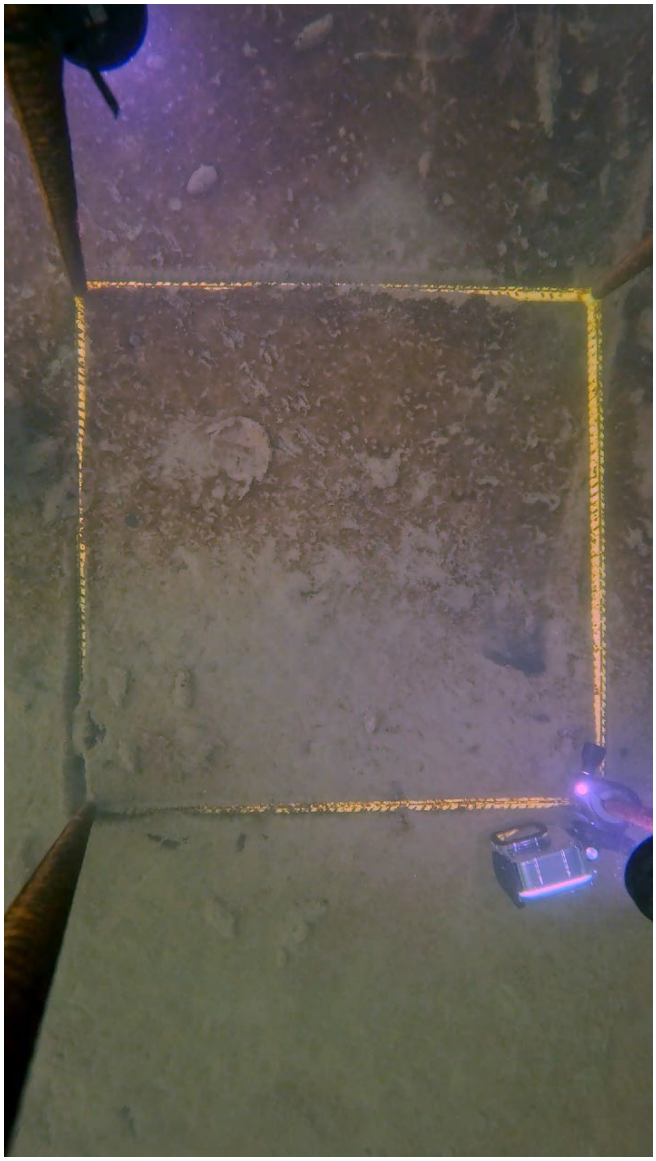
Notes:

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*

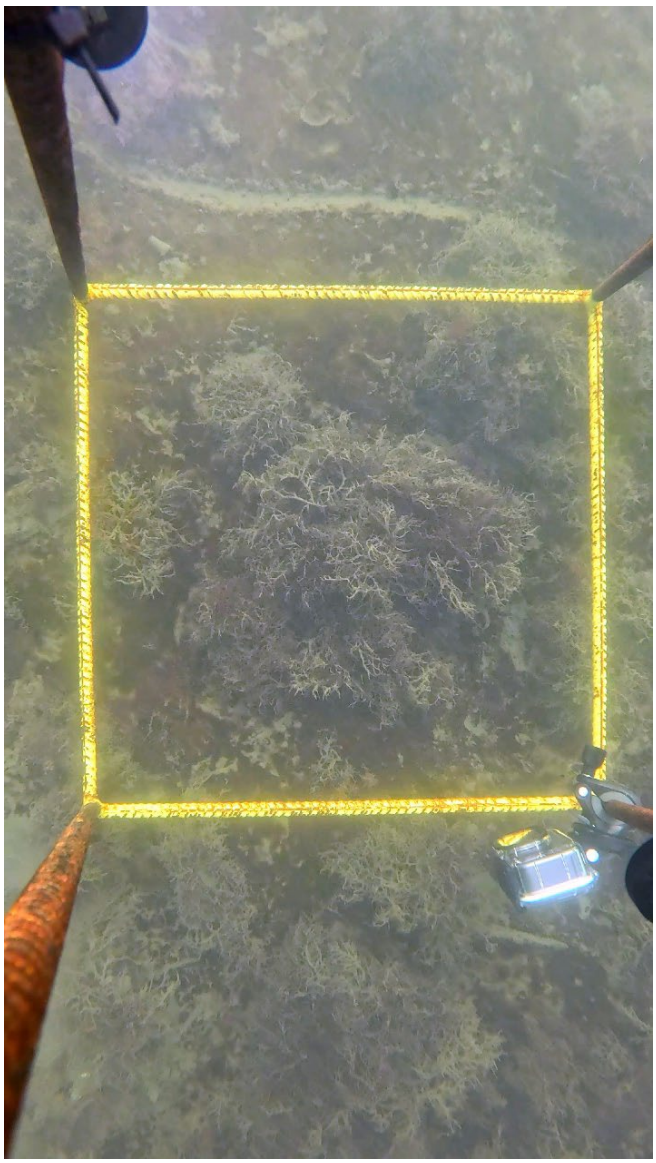
Start Coordinates (NAD83): *42.350197, -71.052903*	Stop Coordinates (NAD83): *42.350126, -71.052902*	Water Depth (FT): *-13.3*

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:	***Fort Point Channel***		Station:	***FP-7***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.350070*	Longitude (NAD83): *-71.053392*	Water Depth (FT): *-7.4*		

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

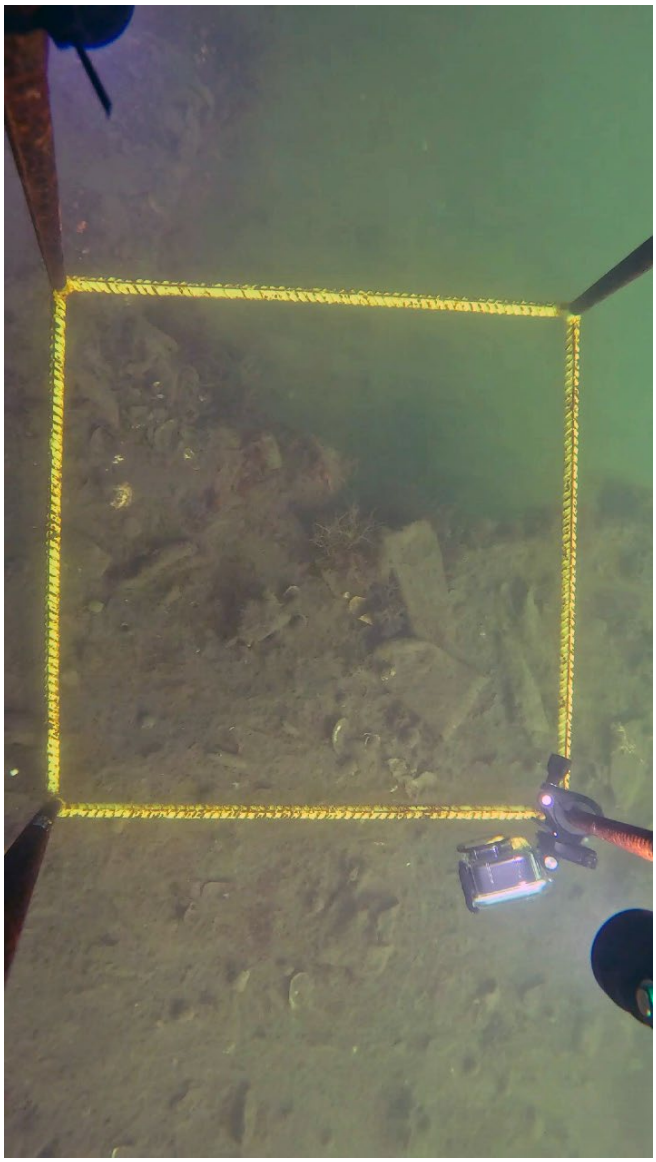
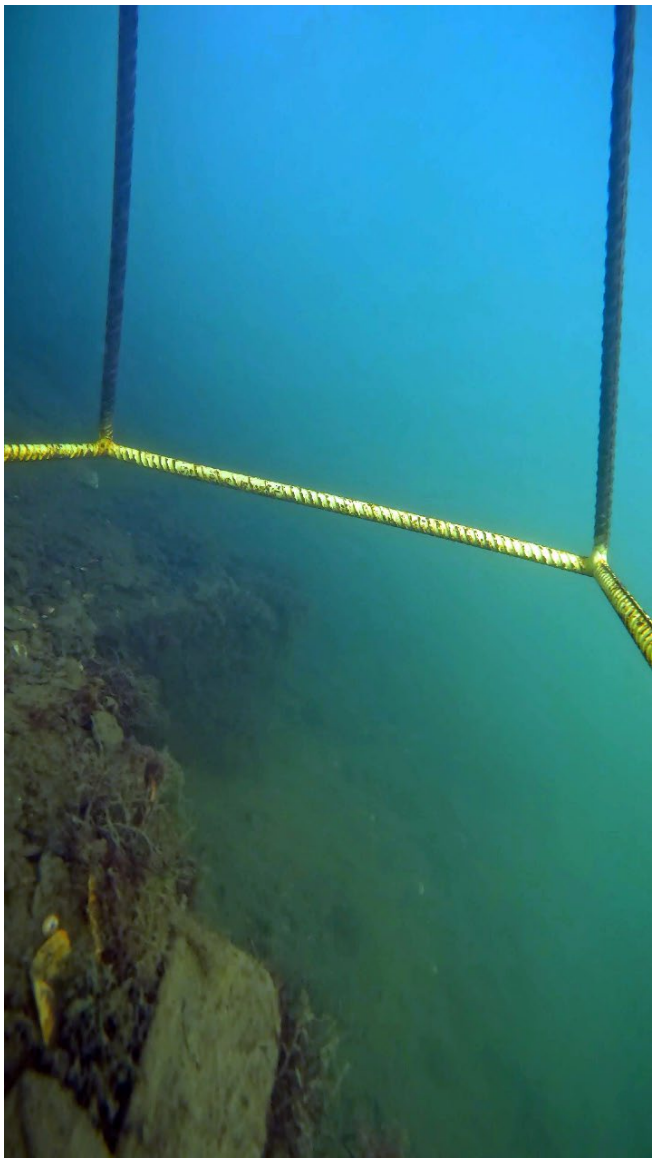
Notes:

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): *42.348469, -71.054460*	Stop Coordinates (NAD83): *42.348675, -71.054432*	Water Depth (FT): *-7.5*

Plan View	Profile View
	

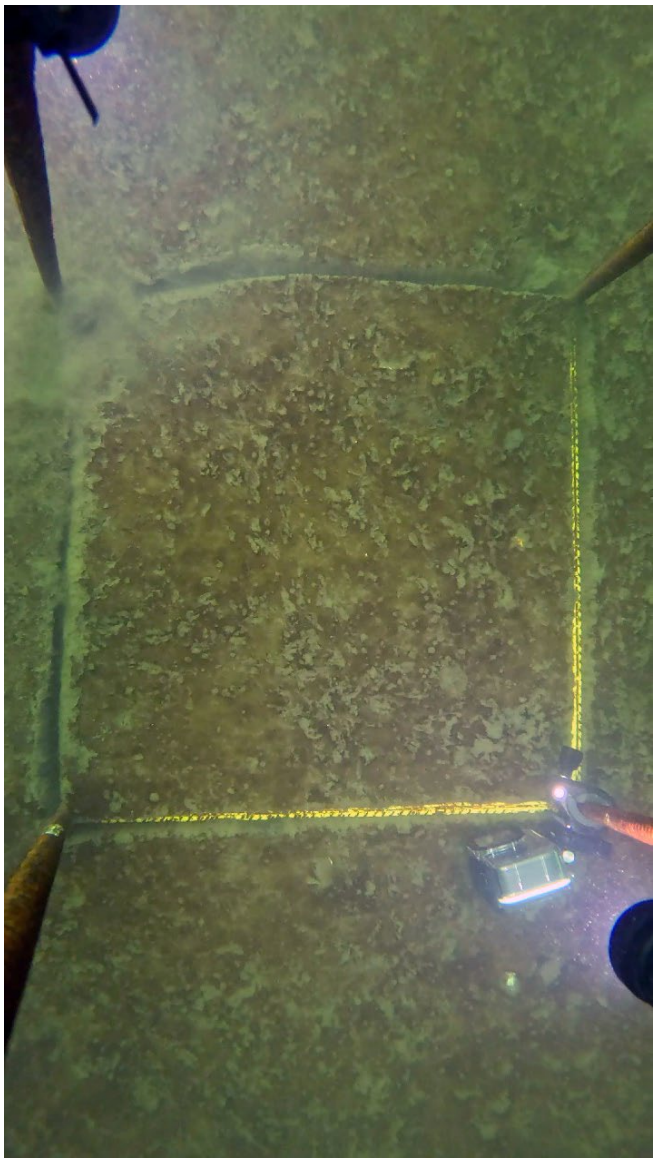
Notes:

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
	

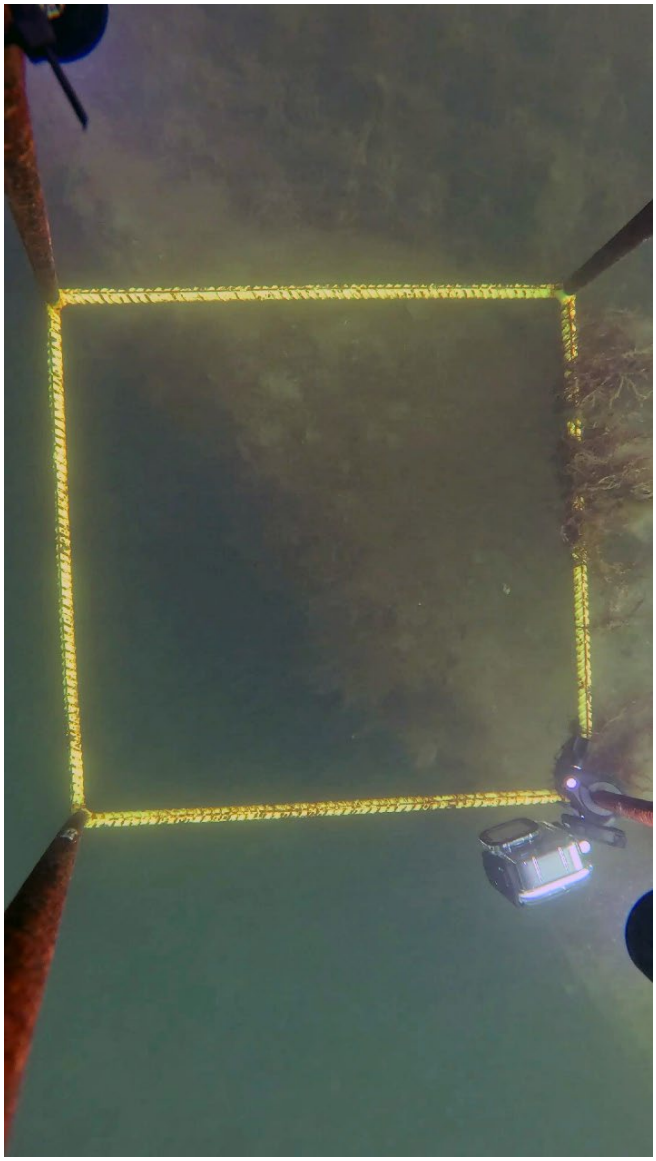
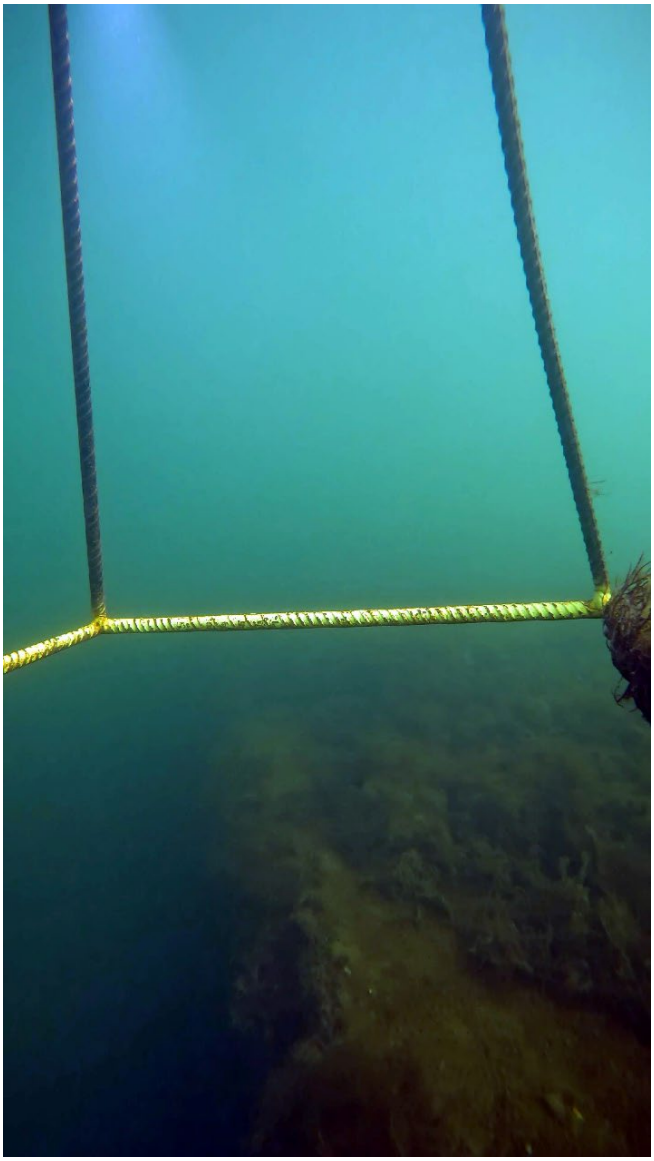
Notes:

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
	

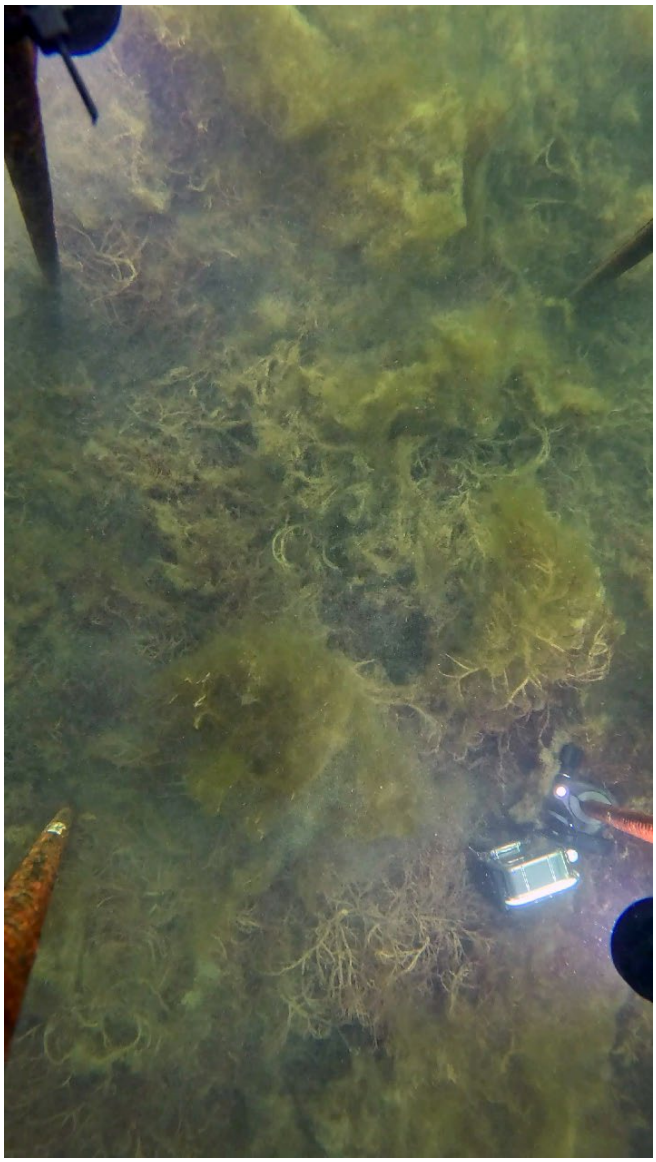
Notes:

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
	

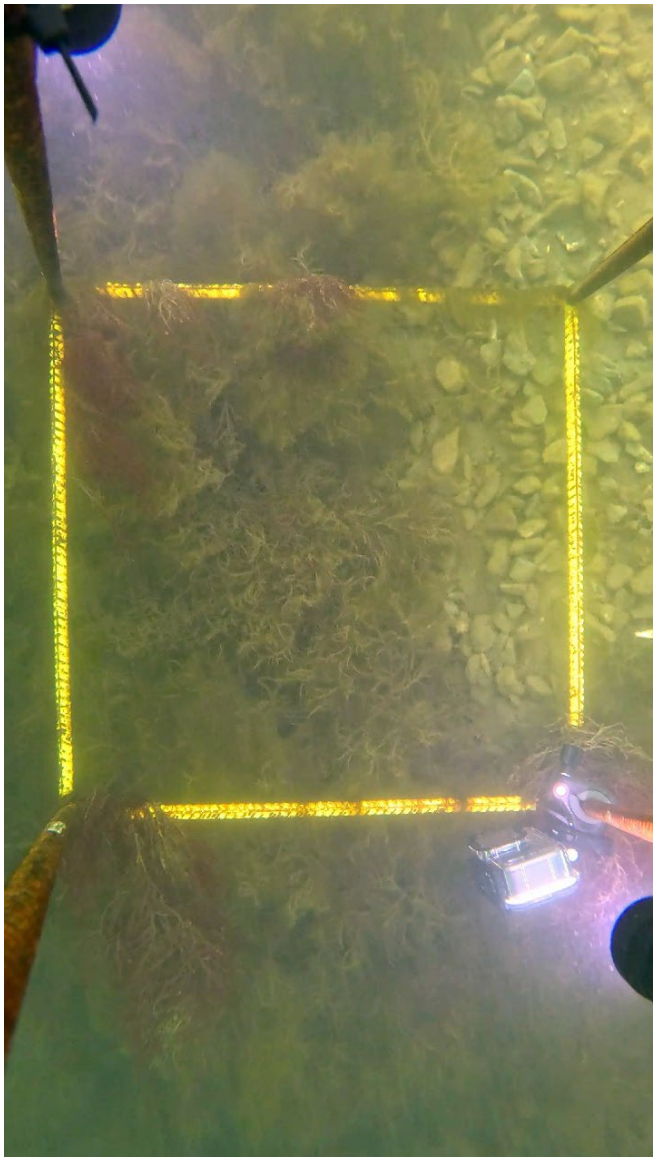
Notes:

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:	***Fort Point Channel***		Station:	***FP-10***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.345884*	Longitude (NAD83): *-71.055464*	Water Depth (FT): *-11.0*		

Plan View	Profile View

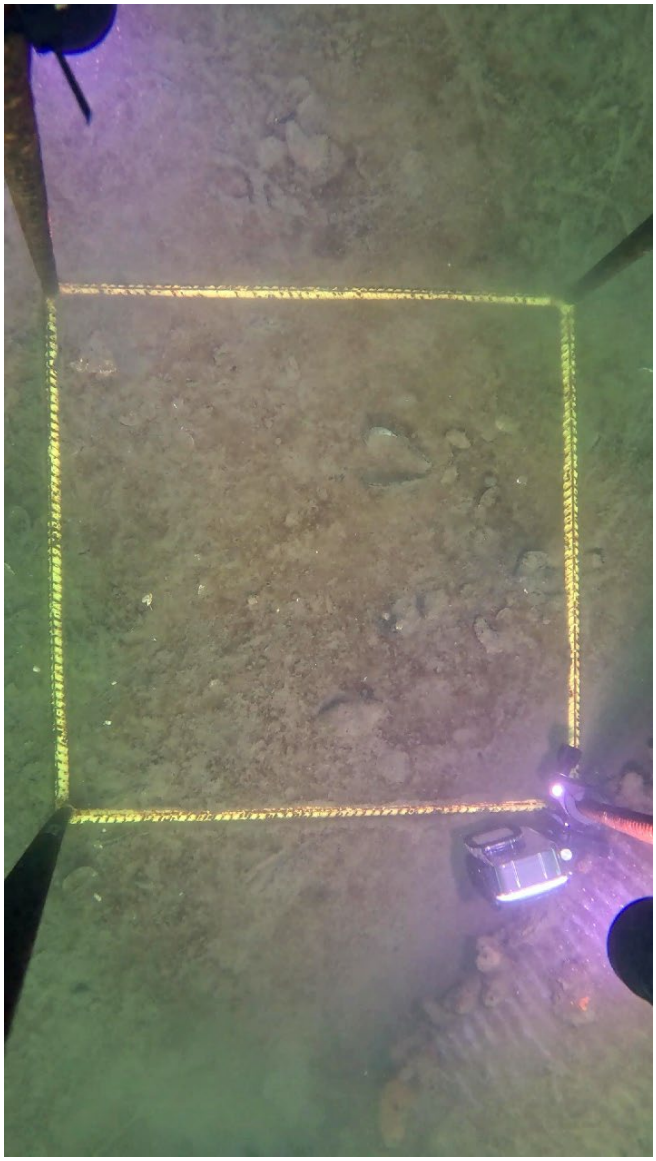
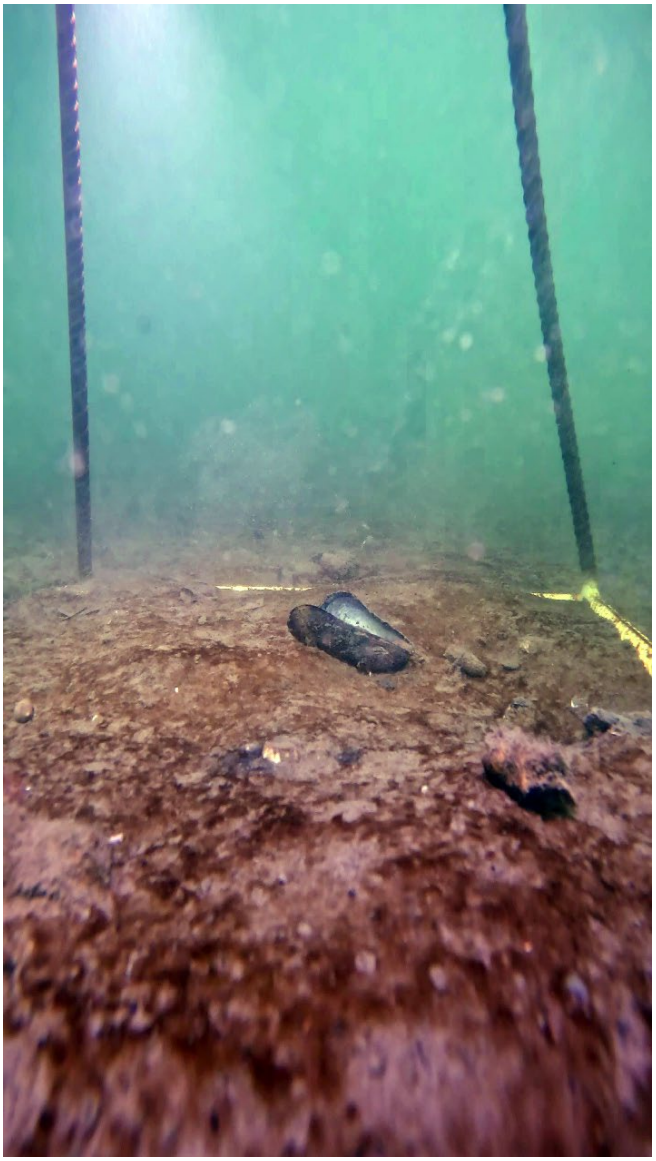
Notes:

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
	

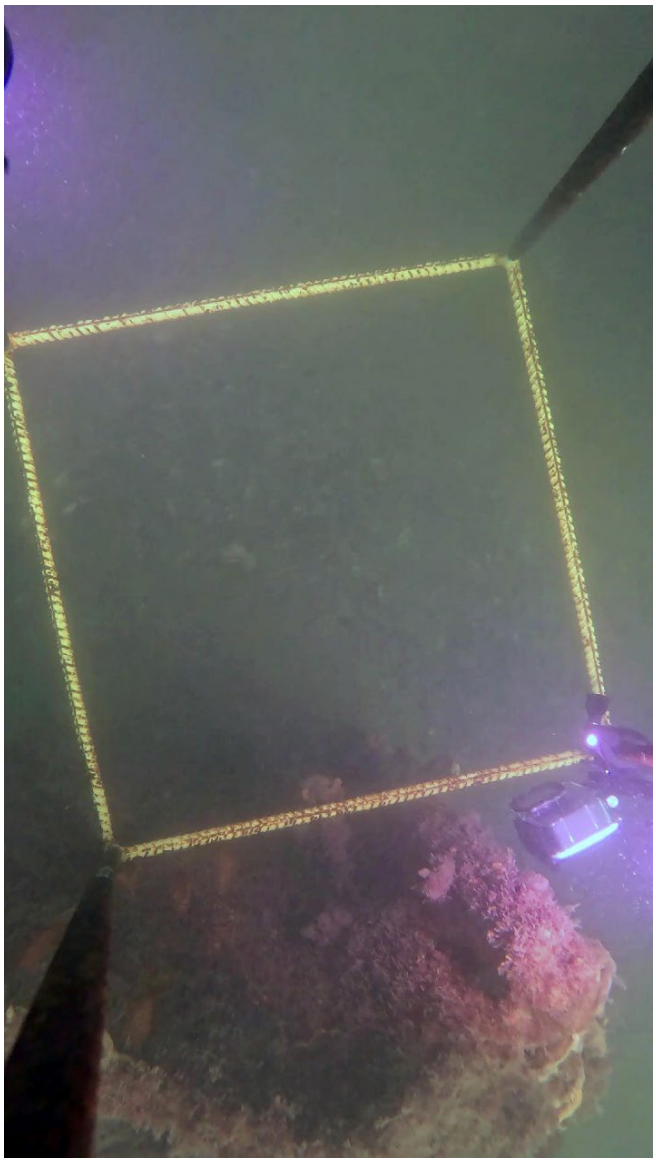
Notes:

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
	

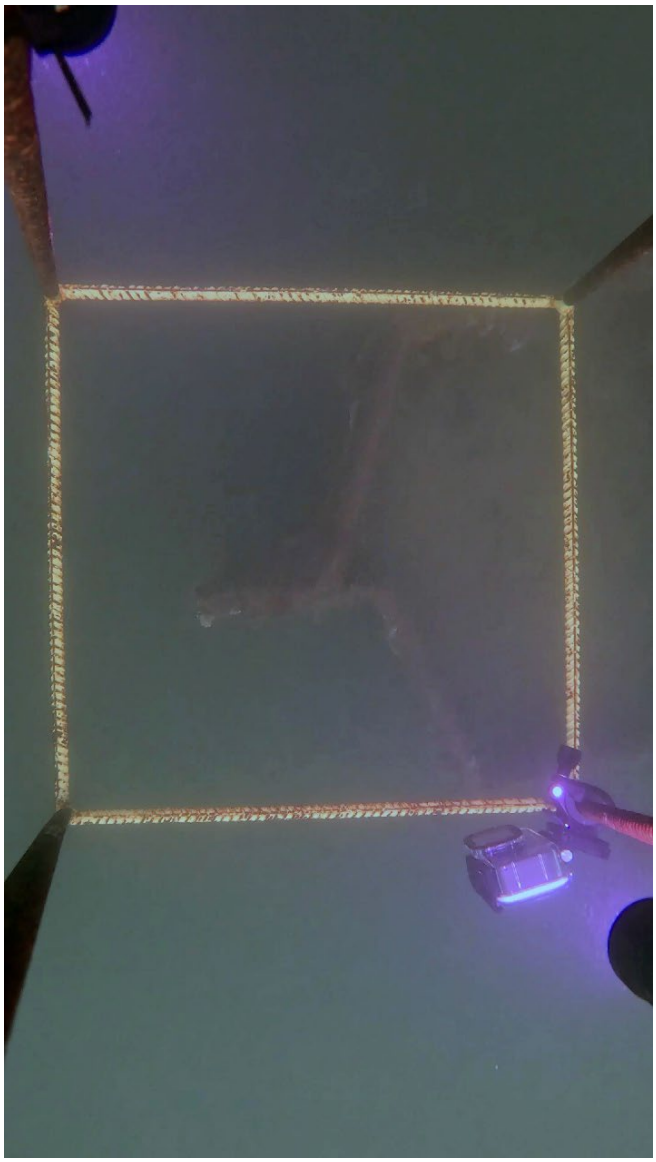
Notes:

Silt with shells and large anthropogenic structure including a fallen wooden piling. Structures covered with tunciates, 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): *42.347992, -71.053582*	Stop Coordinates (NAD83): *42.348037, -71.053444*	Water Depth (FT): *-21.5*

Plan View	Profile View
	

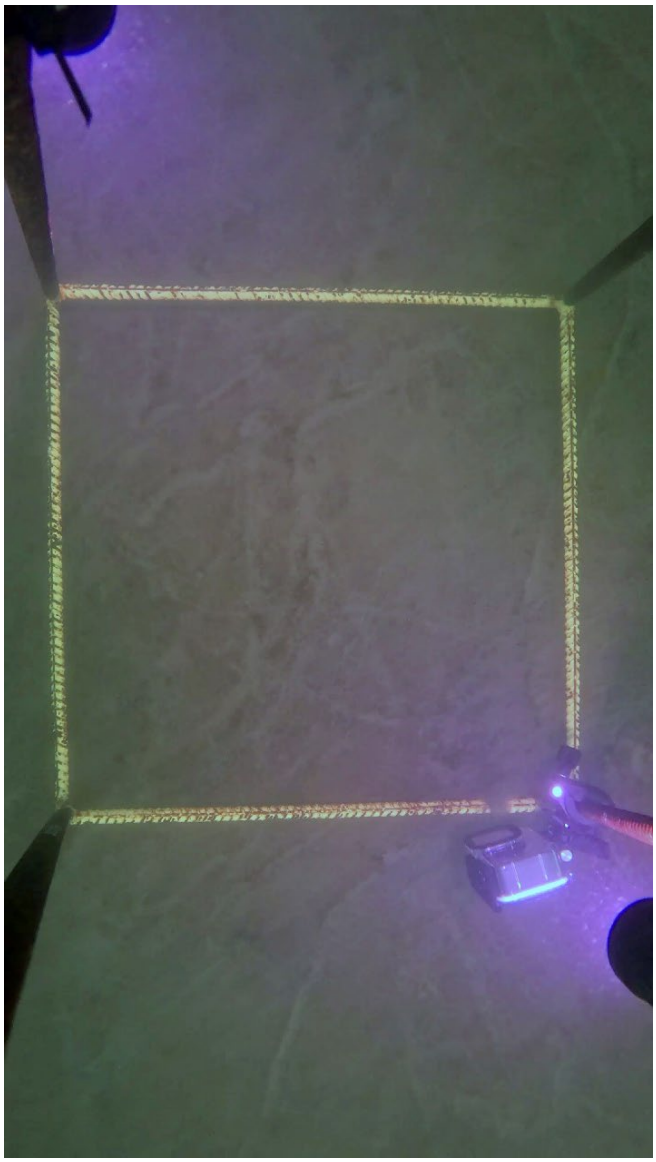
Notes:

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*

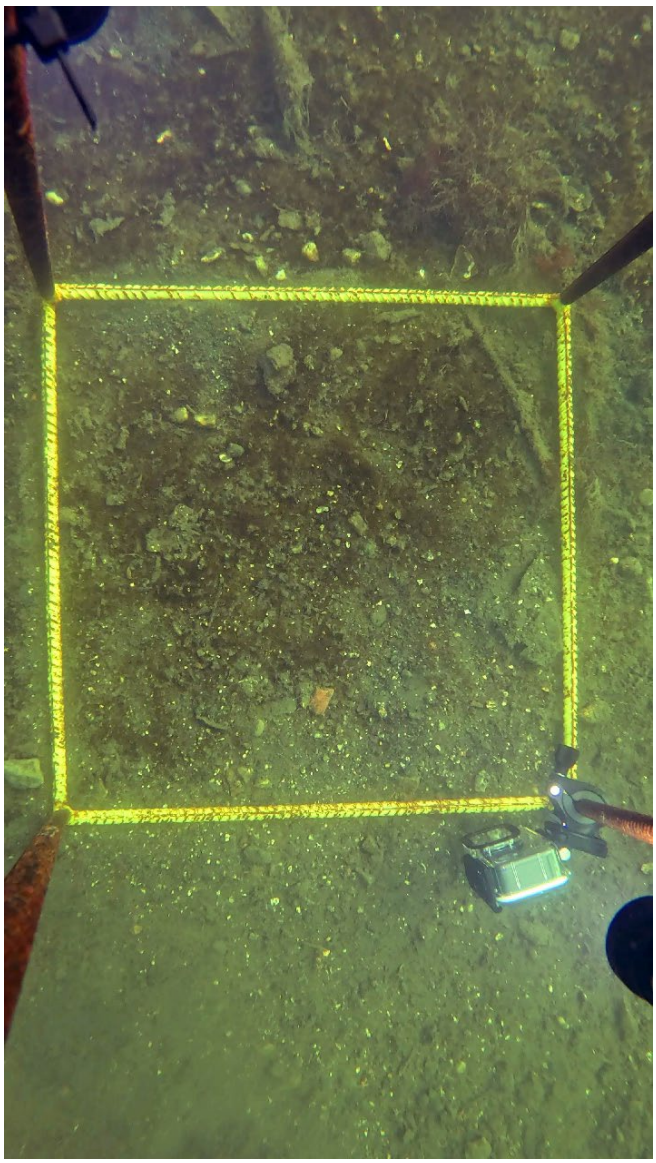
Start Coordinates (NAD83): *42.347992, -71.053582*	Stop Coordinates (NAD83): *42.348037, -71.053444*	Water Depth (FT): *-21.5*

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:	***Fort Point Channel***		Station:	***FP-12***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.349922*	Longitude (NAD83): *-71.051858*	Water Depth (FT): *-14.3*		

Plan View	Profile View
	

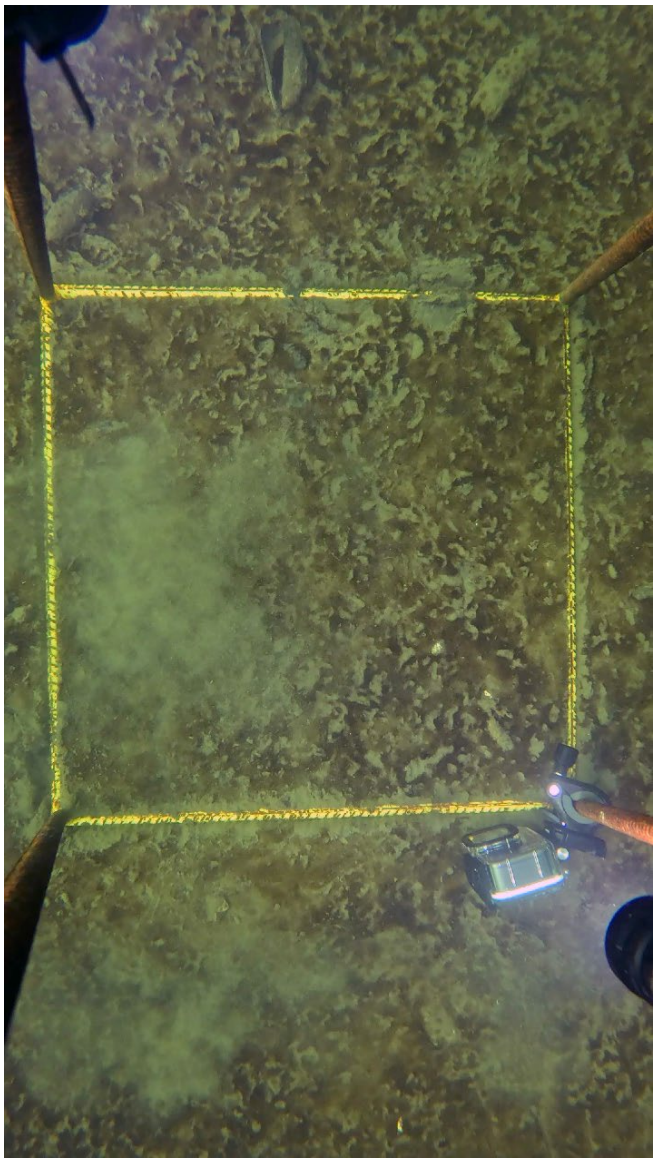
Notes:

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): *42.352554, -71.049784*	Stop Coordinates (NAD83): *42.352605, -71.049833*	Water Depth (FT): *-10.9*

Plan View	Profile View
	

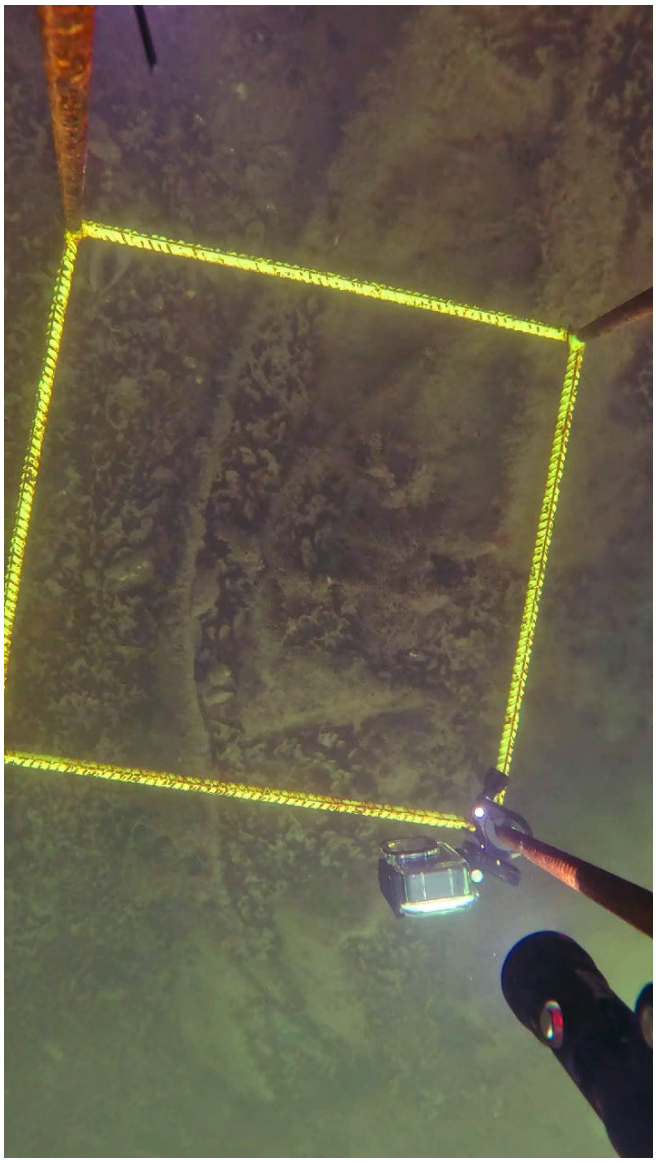
Notes:

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
	

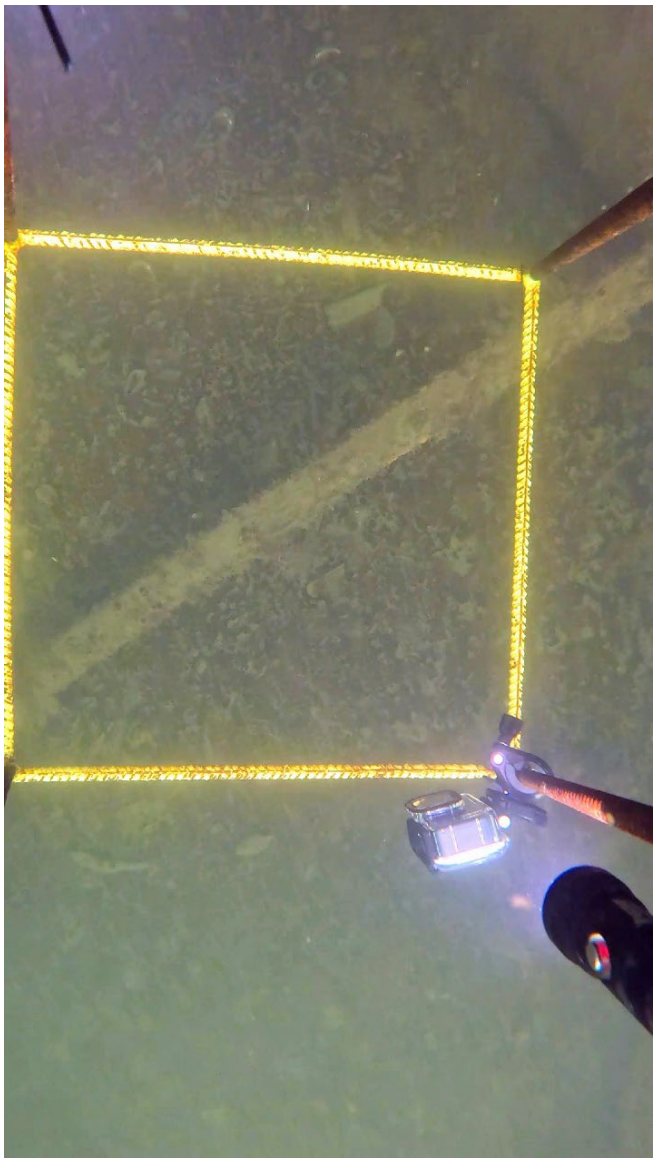
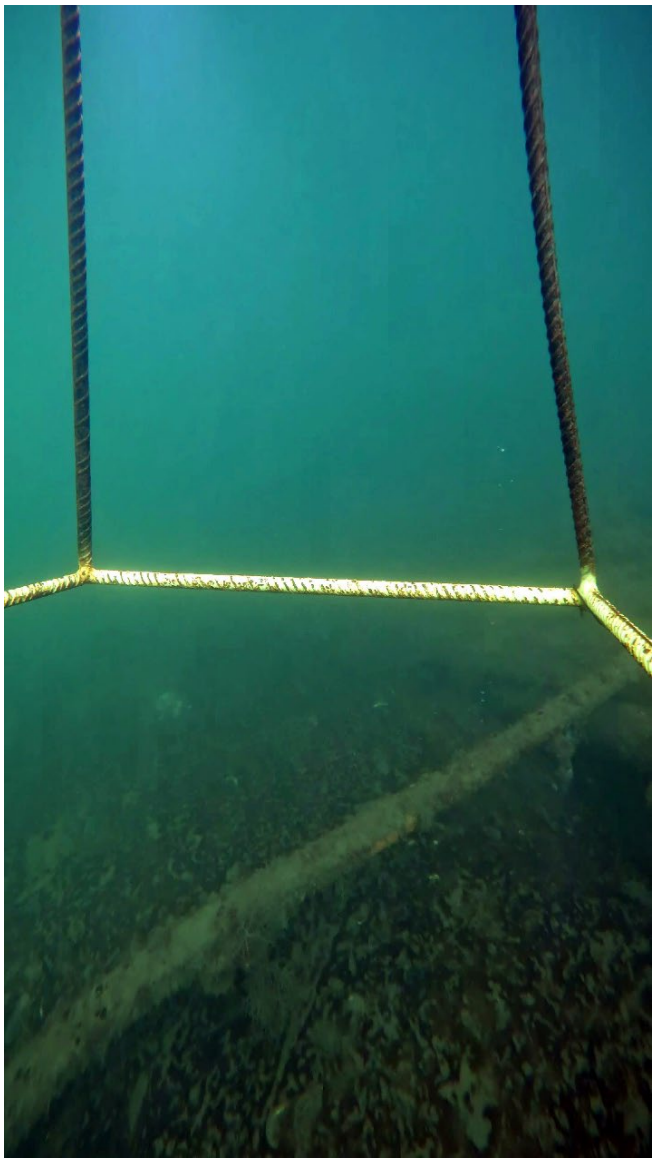
Notes:

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
	

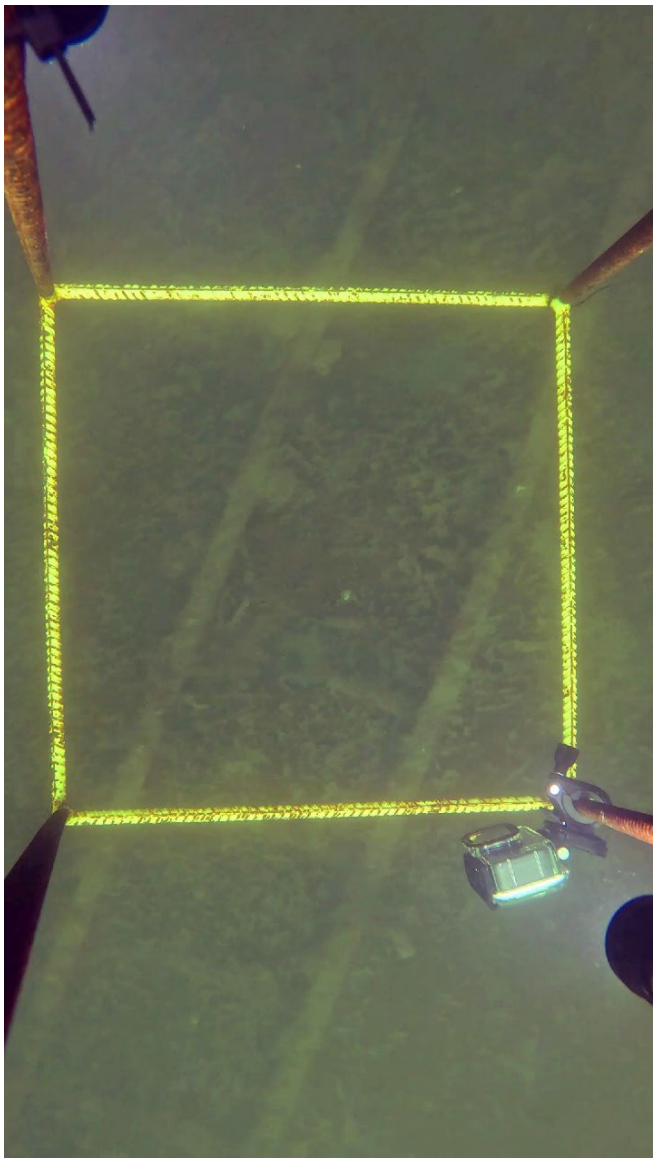
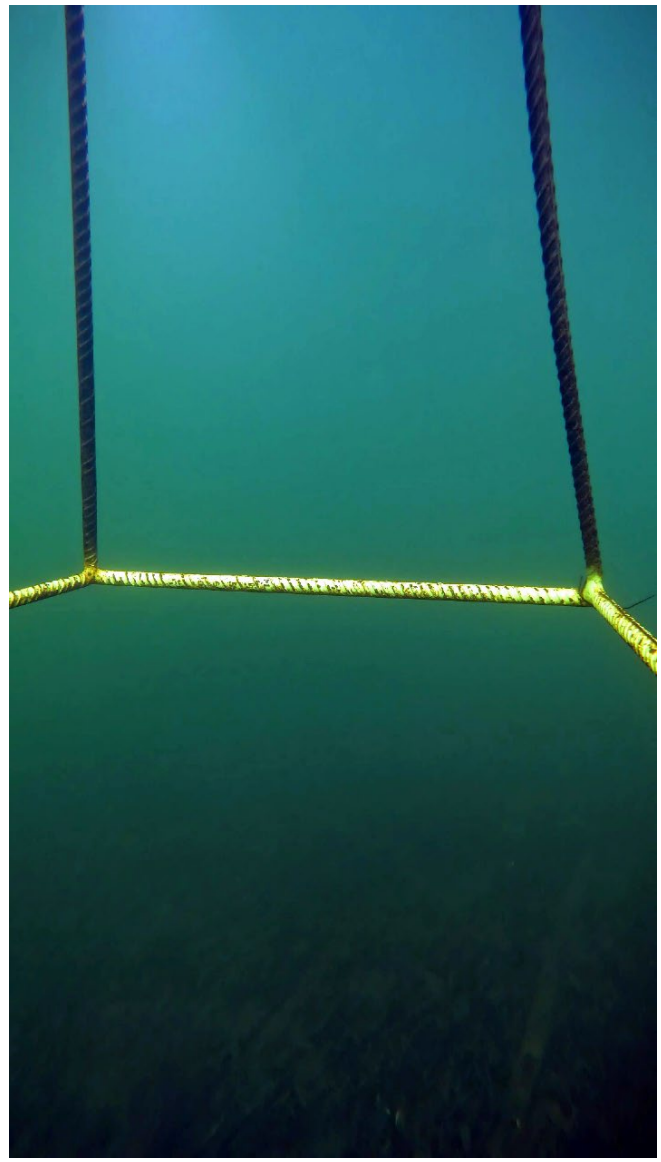
Notes:

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*

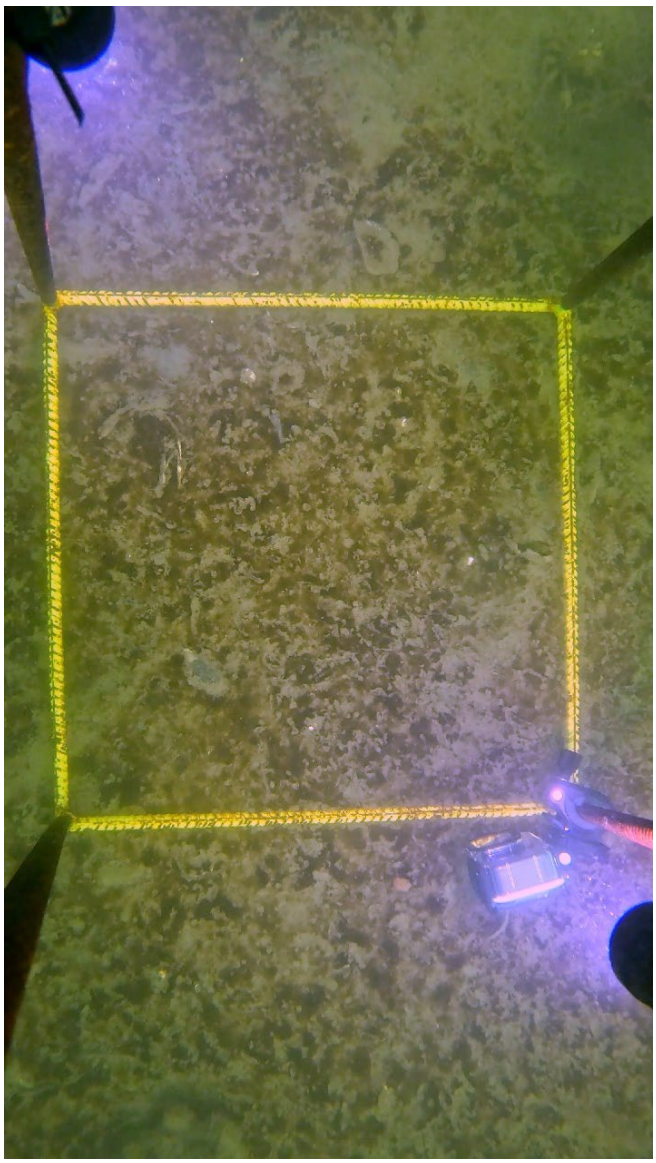
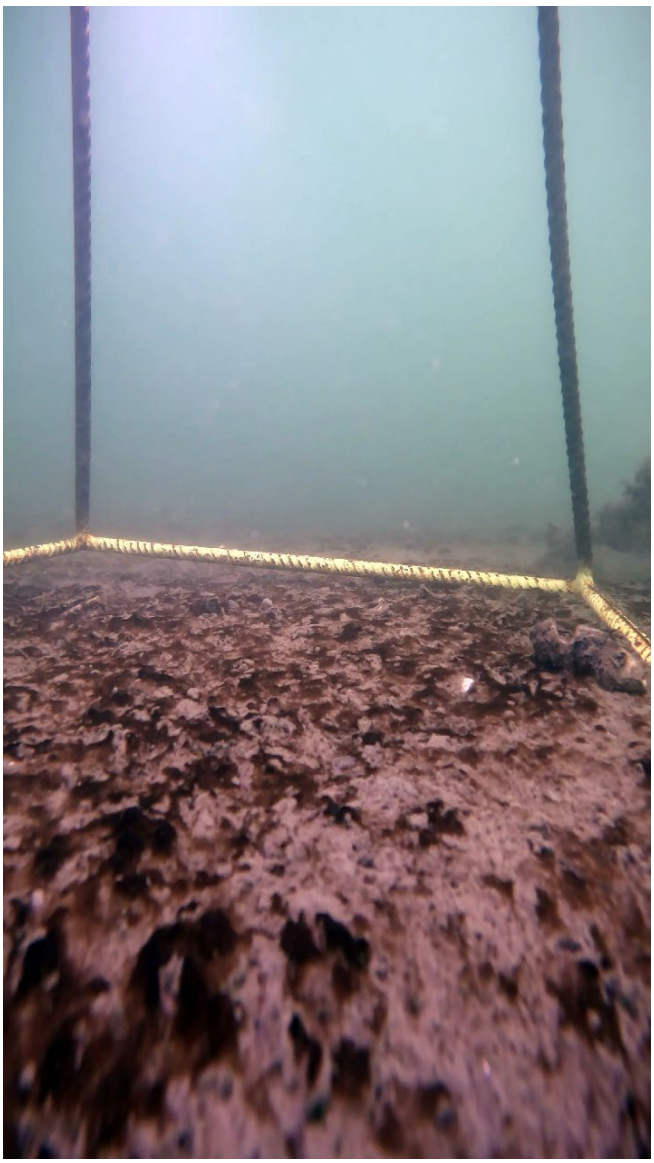
Start Coordinates (NAD83): *42.352554, -71.049784*	Stop Coordinates (NAD83): *42.352605, -71.049833*	Water Depth (FT): *-14.4*

Plan View	Profile View
	

Notes:

Silt with a thick cover of microbial algae and scattered anthropogenic debris. Two parralel metal rails visible in plan-view image. Located on the eastern edge of Fort Point Channel adjacent to Martin's Park.

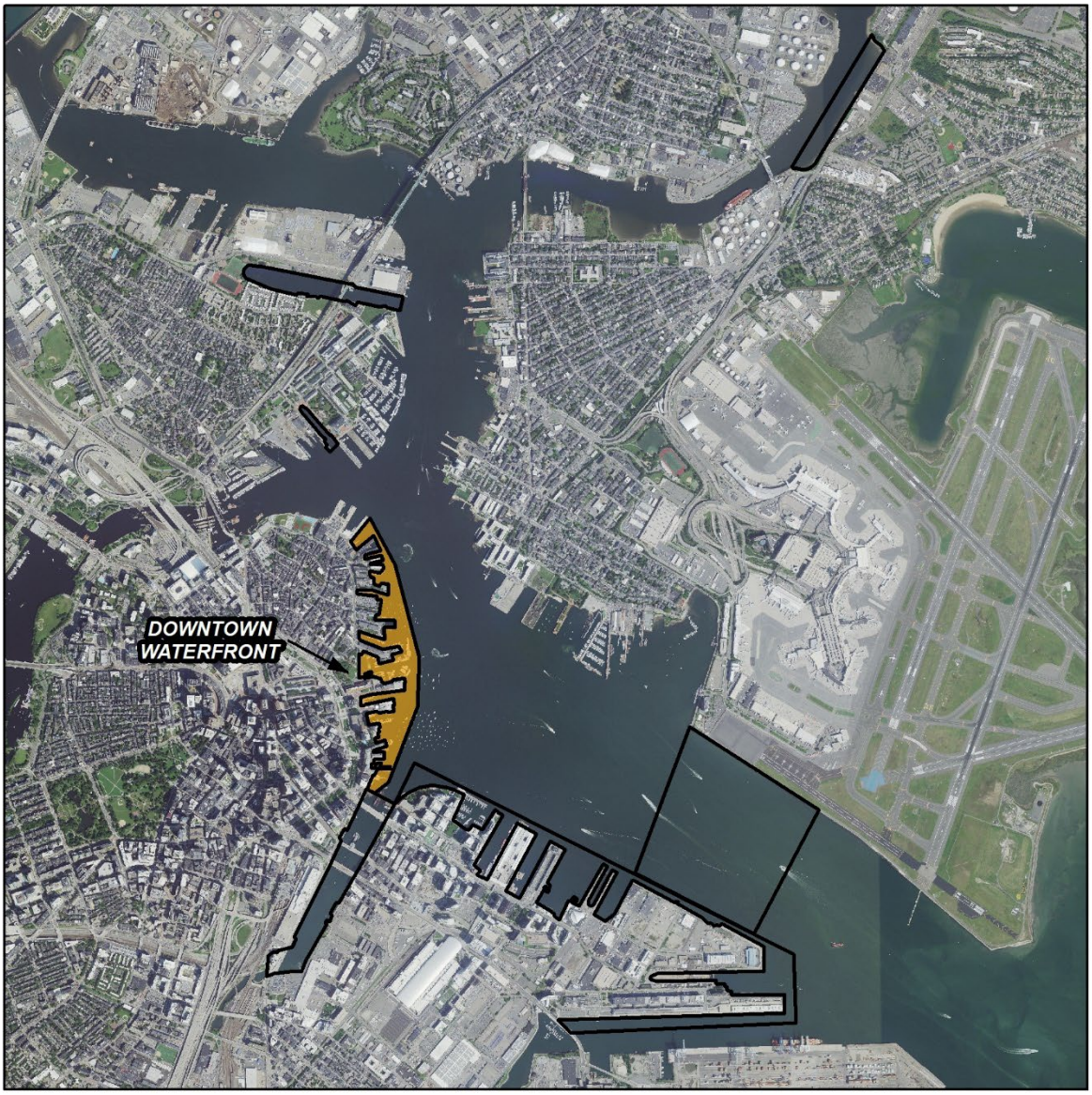
Survey Area:	***Fort Point Channel***		Station:	***FP-14***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.354645*	Longitude (NAD83): *-71.048761*	Water Depth (FT): *-16.9*		

Plan View	Profile View
	

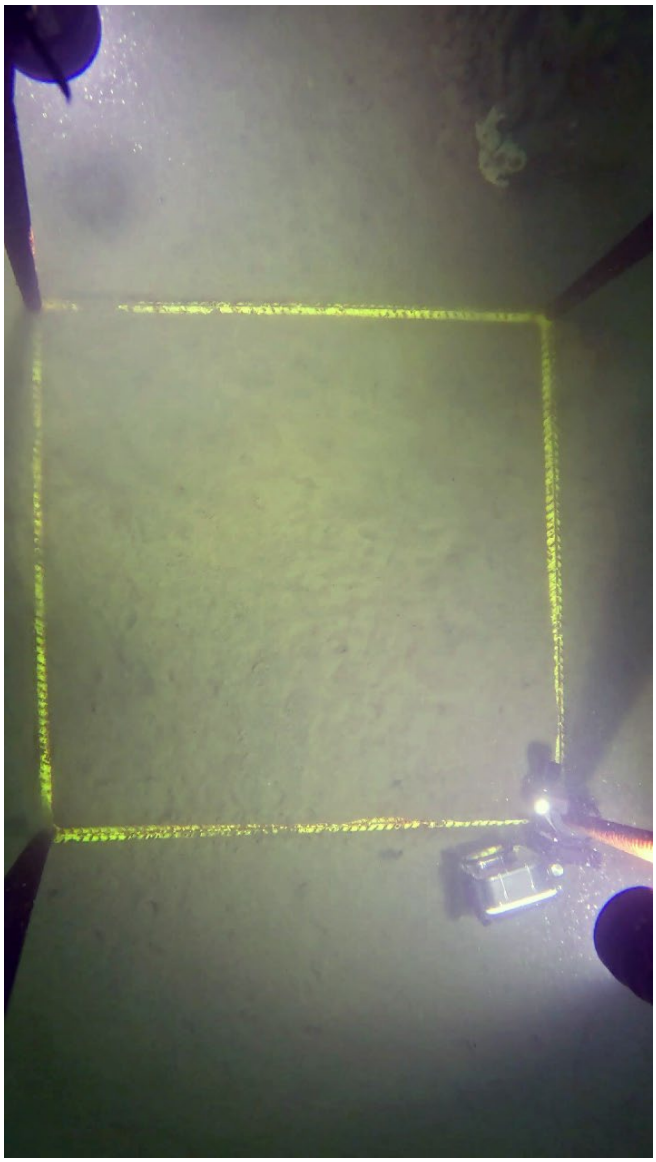
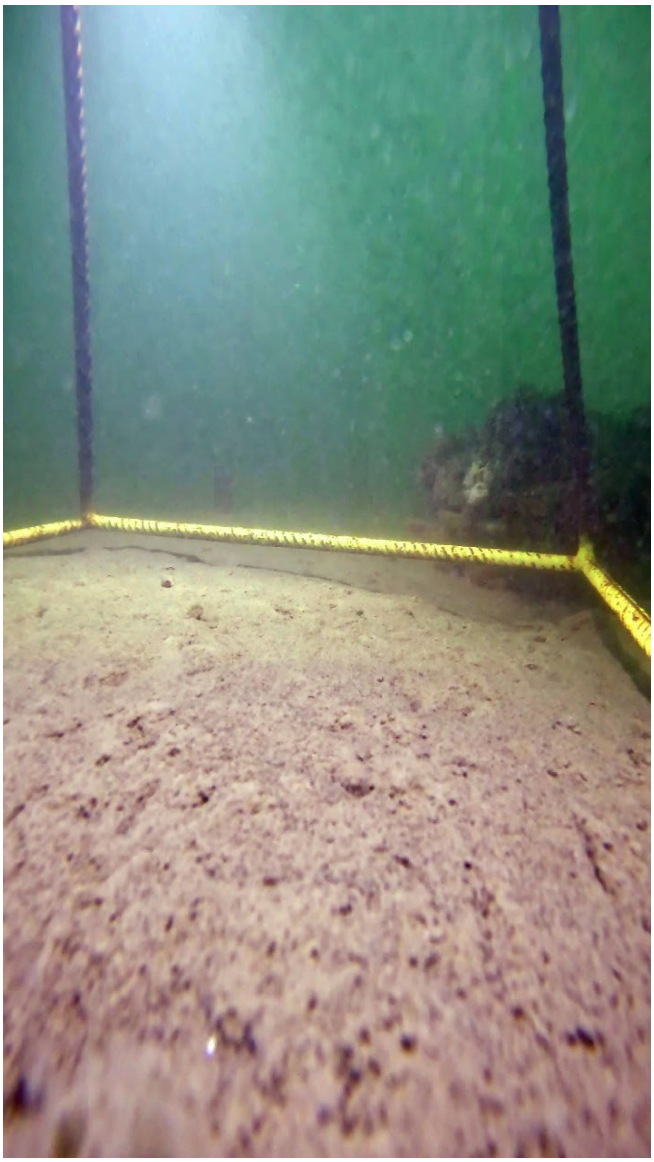
Notes:

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



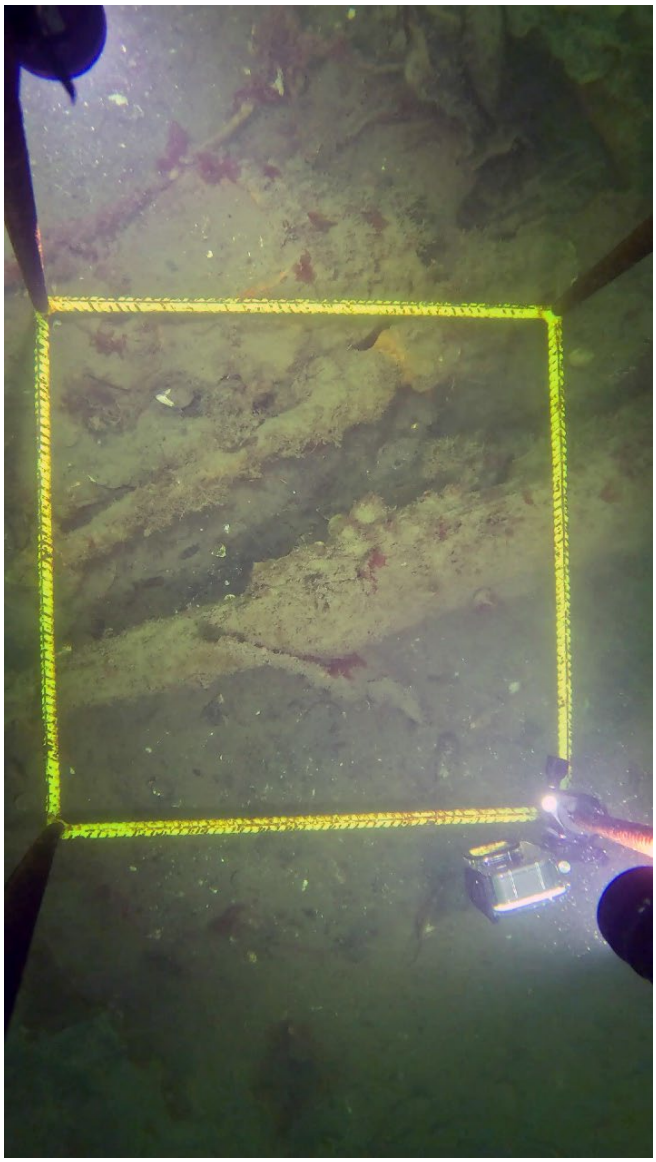
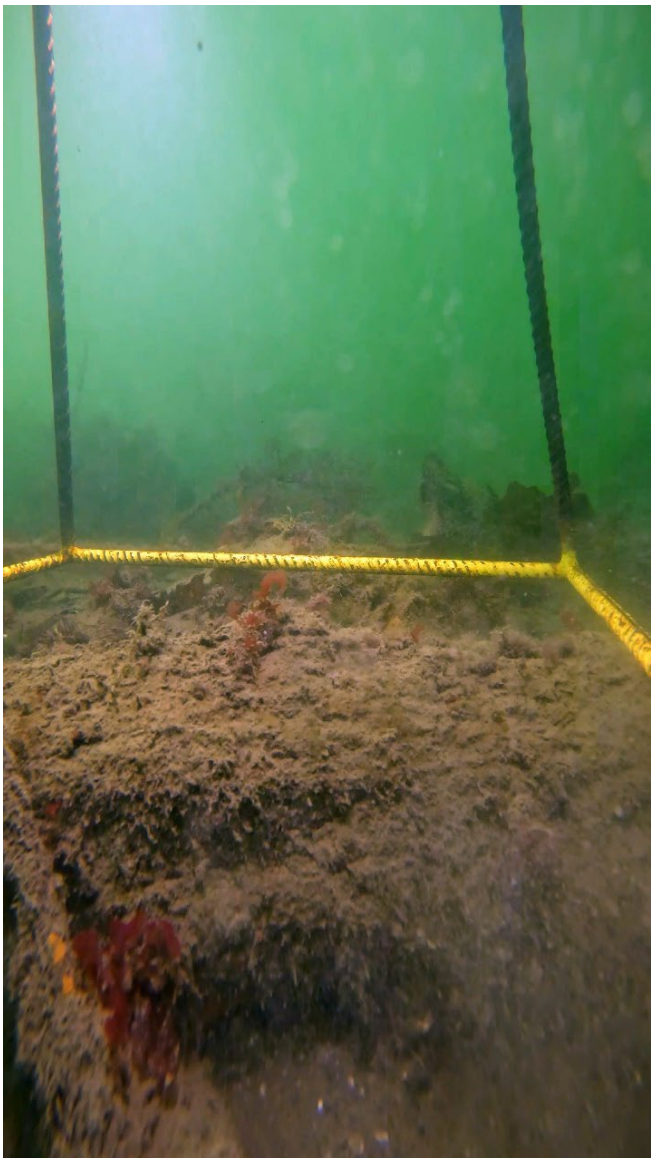
Survey Area:	***Downtown Waterfront***		Station:	***DT-1***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.368000*	Longitude (NAD83): *-71.049995*	Water Depth (FT): *-24.5*		

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.

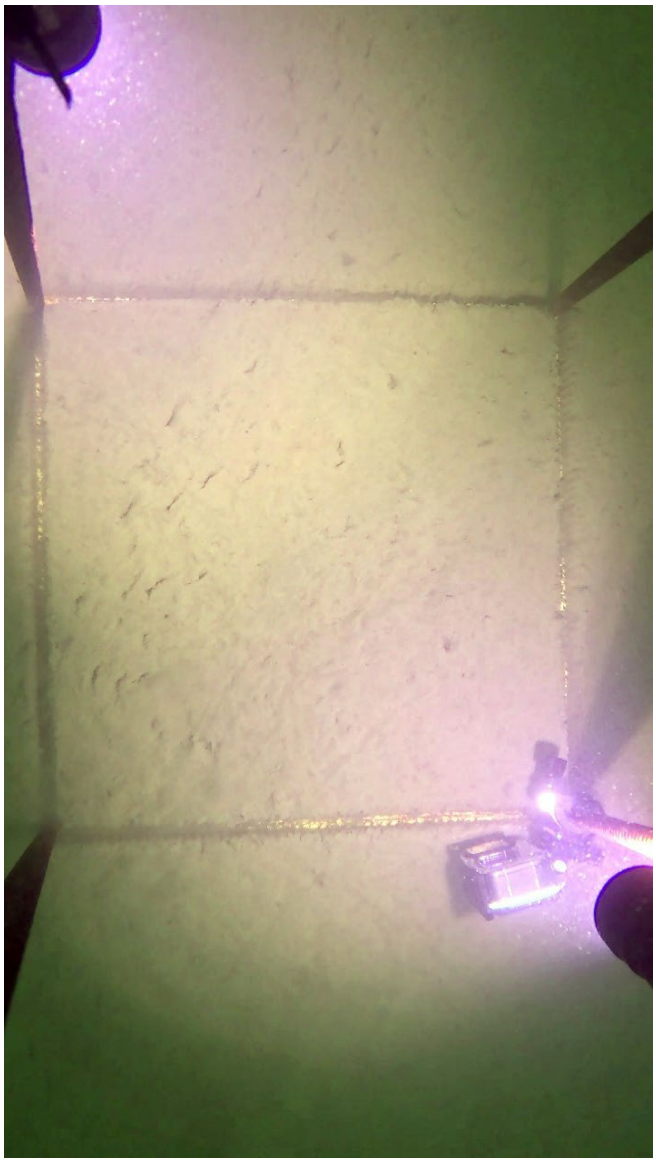
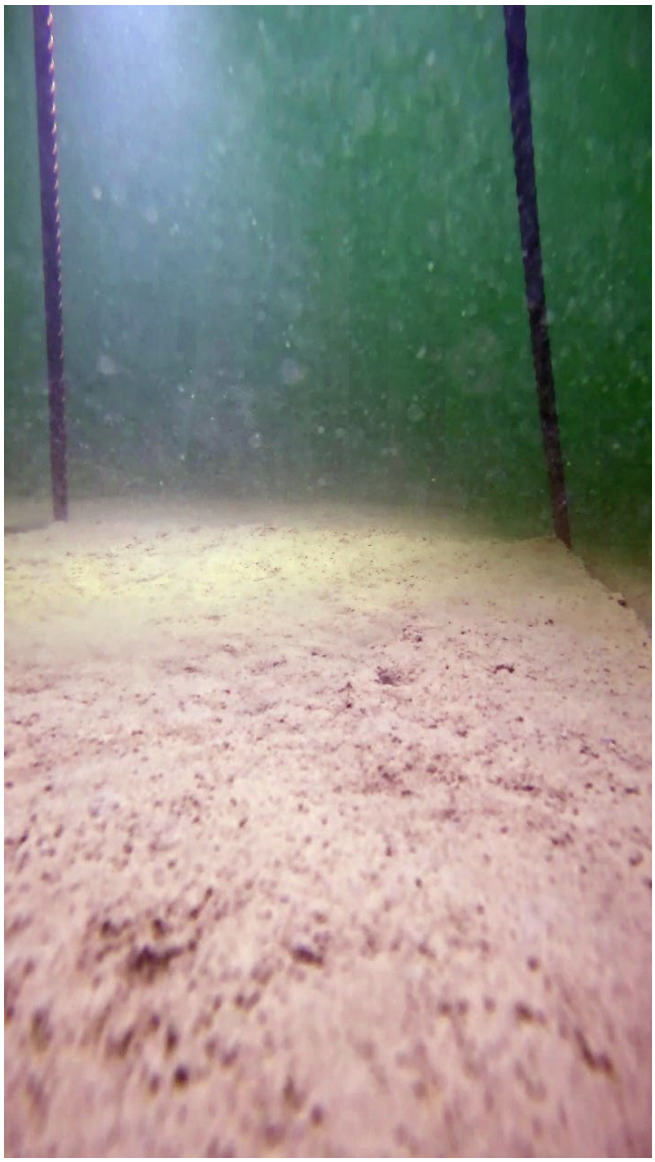
Survey Area:	***Downtown Waterfront***		Station:	***DT-2***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.367528*	Longitude (NAD83): *-71.049639*	Water Depth (FT): *-15.7*		

Plan View	Profile View
	

Notes:

Large submerged anthropogenic debris (likely historic/derelict wooden wharf structures) with mixed macroalgae, encrusting sponges (likely Halichondria panicea), ectoprocts (Bugula sp.), hydroids, and tunicates attached. Located in front of Battery Wharf.

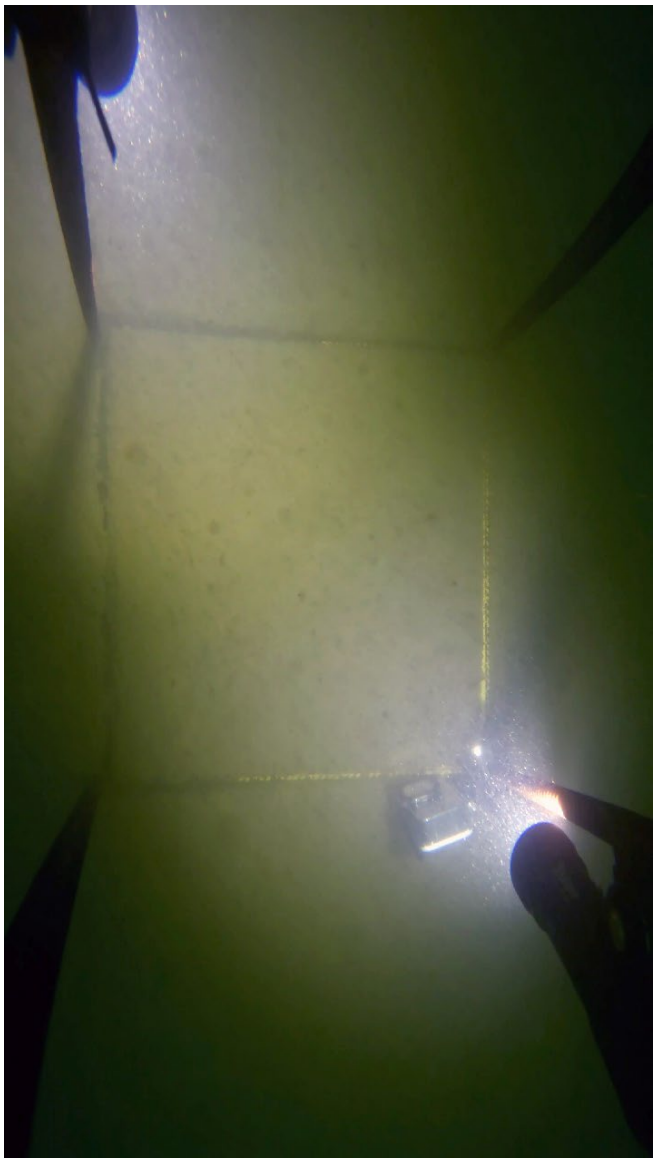
Survey Area:	***Downtown Waterfront***		Station:	***DT-3***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.367427*	Longitude (NAD83): *-71.049119*	Water Depth (FT): *-29.9*		

Plan View	Profile View
	

Notes:

Bare silt with small infaunal invertebrate tubes and burrows. Located adjacent to Battery Wharf.

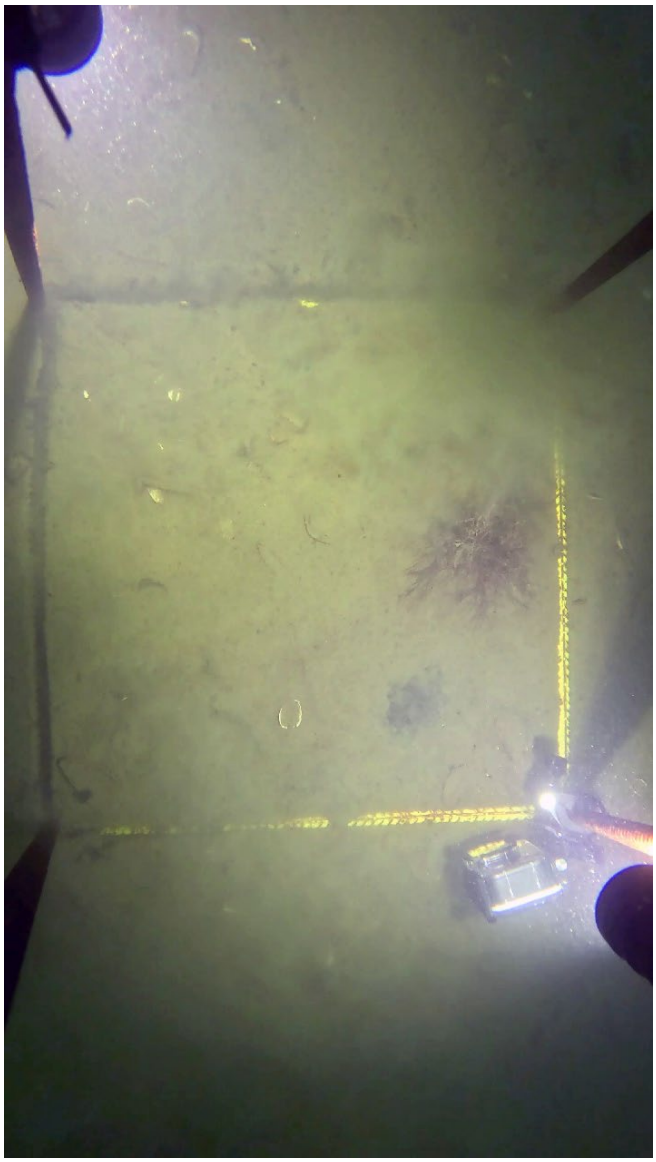
Survey Area:	***Downtown Waterfront***		Station:	***DT-4***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.367236*	Longitude (NAD83): *-71.048532*	Water Depth (FT): *-35.7*		

Plan View	Profile View
	*No image available*

Notes:

Bare silt with small infaunal invertebrate burrows. Located approximately 50 feet north of Sumner Tunnel.

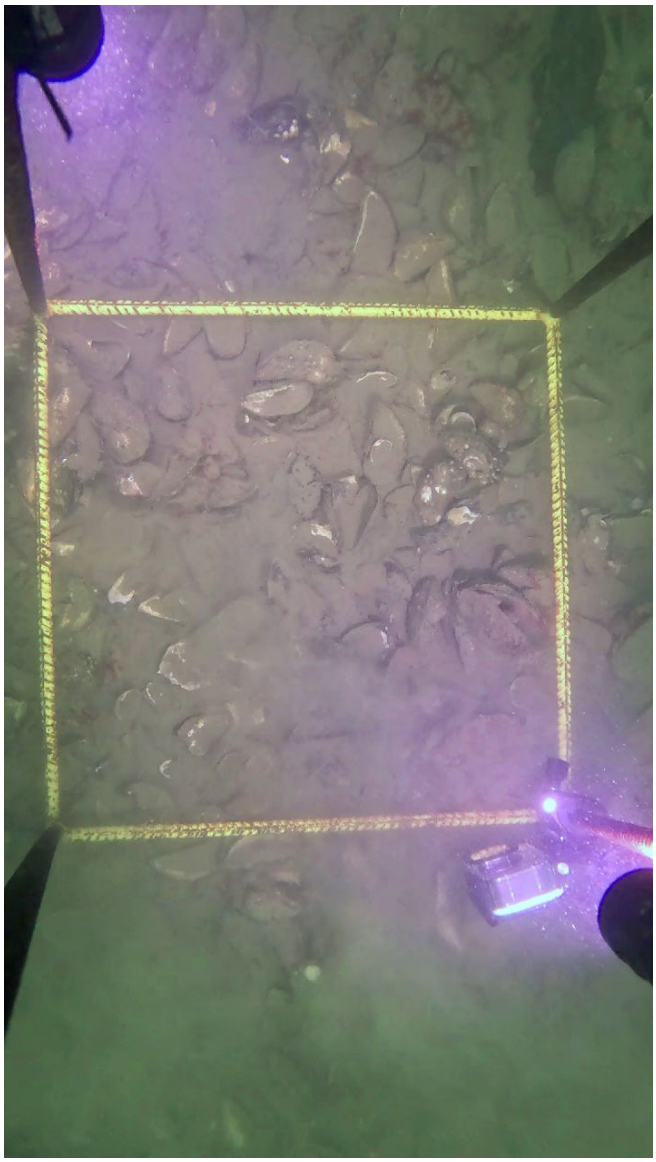
Survey Area:	***Downtown Waterfront***		Station:	***DT-5***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.366906*	Longitude (NAD83): *-71.049756*	Water Depth (FT): *-14.3*		

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.

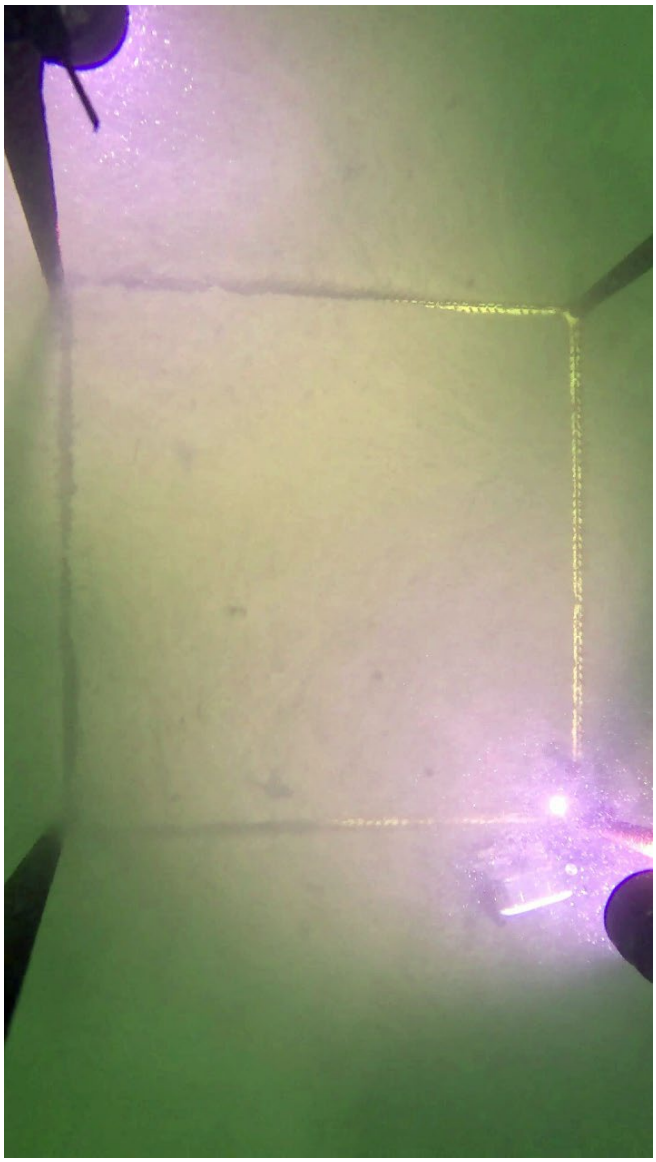
Survey Area:	***Downtown Waterfront***		Station:	***DT-7***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.365740*	Longitude (NAD83): *-71.049302*	Water Depth (FT): *-20.9*		

Plan View	Profile View

Notes:

Bare silt; epifaunal invertebrate tracks visible on sediment surface. Located between Burroughs and Union Wharves.

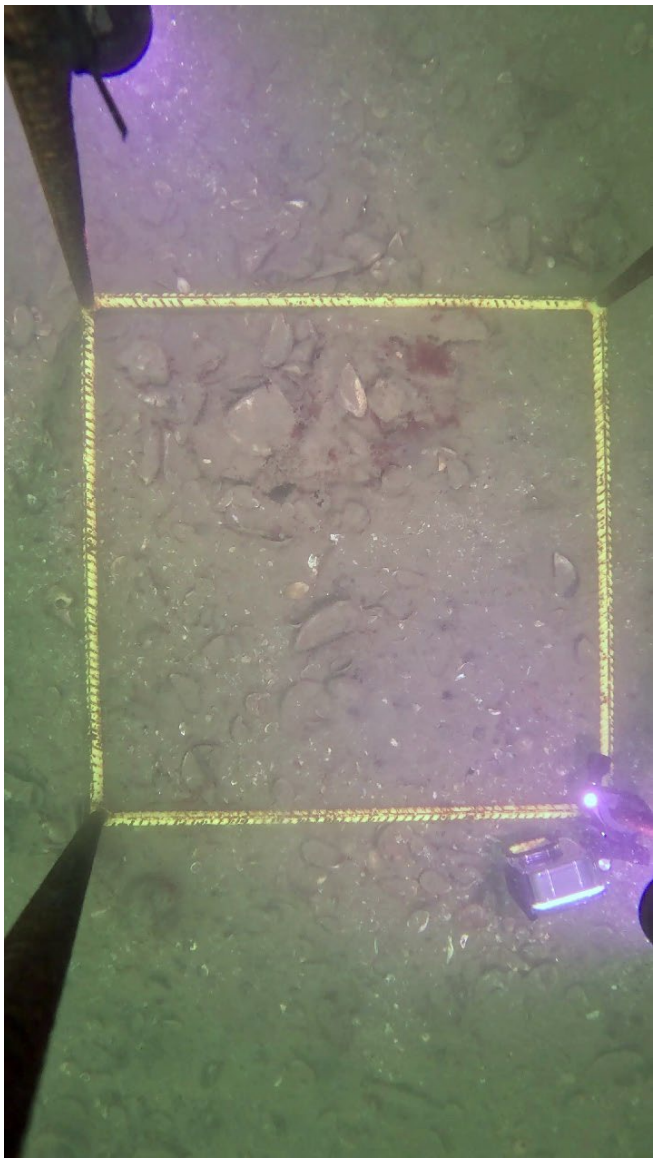
Survey Area:	***Downtown Waterfront***		Station:	***DT-8***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.365583*	Longitude (NAD83): *-71.048465*	Water Depth (FT): *-26.0*		

Plan View	Profile View
	

Notes:

Bare silt with sparse small infaunal invertebrate burrows. Located near Union Wharf.

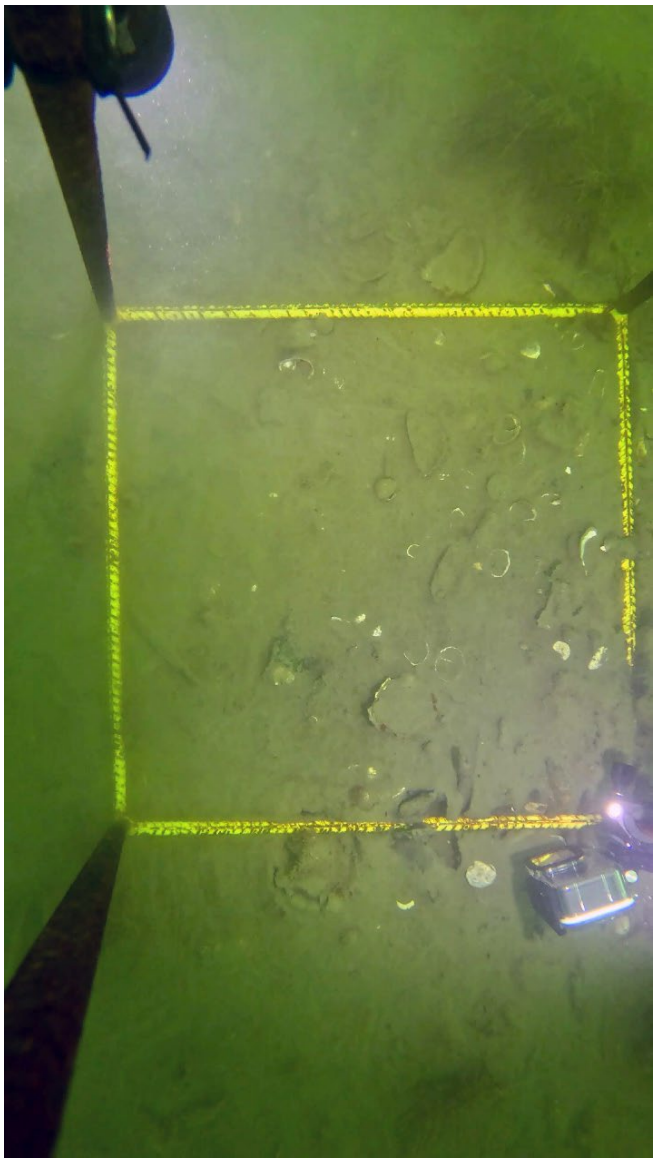
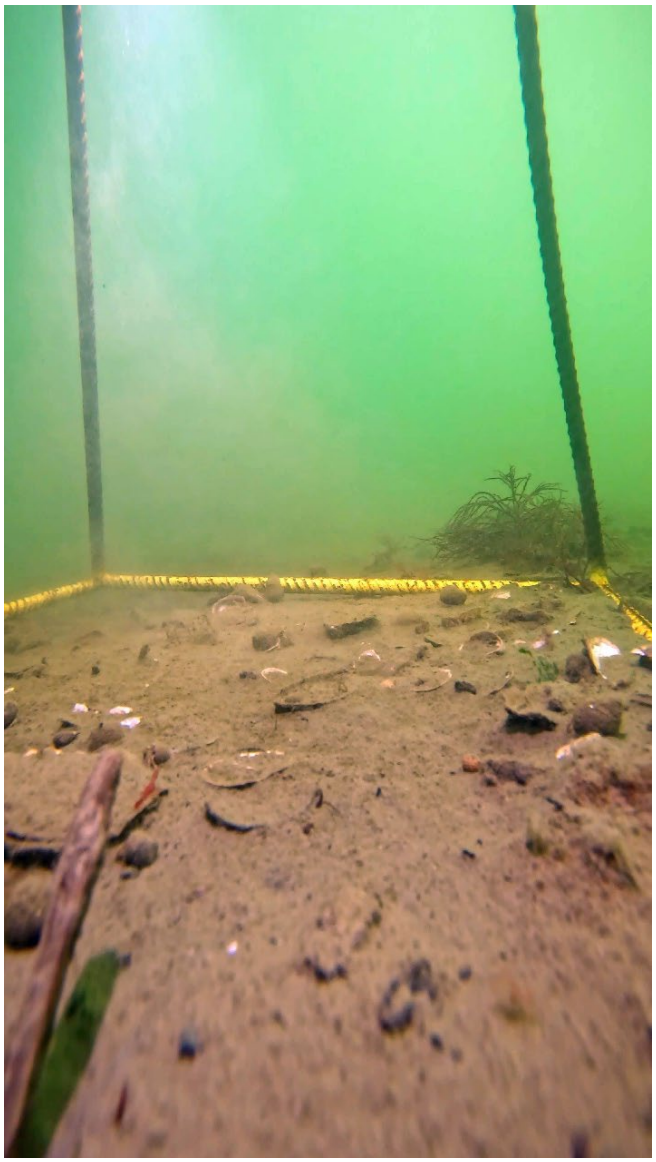
Survey Area:	***Downtown Waterfront***		Station:	***DT-9***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.364899*	Longitude (NAD83): *-71.048677*	Water Depth (FT): *-15.8*		

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.

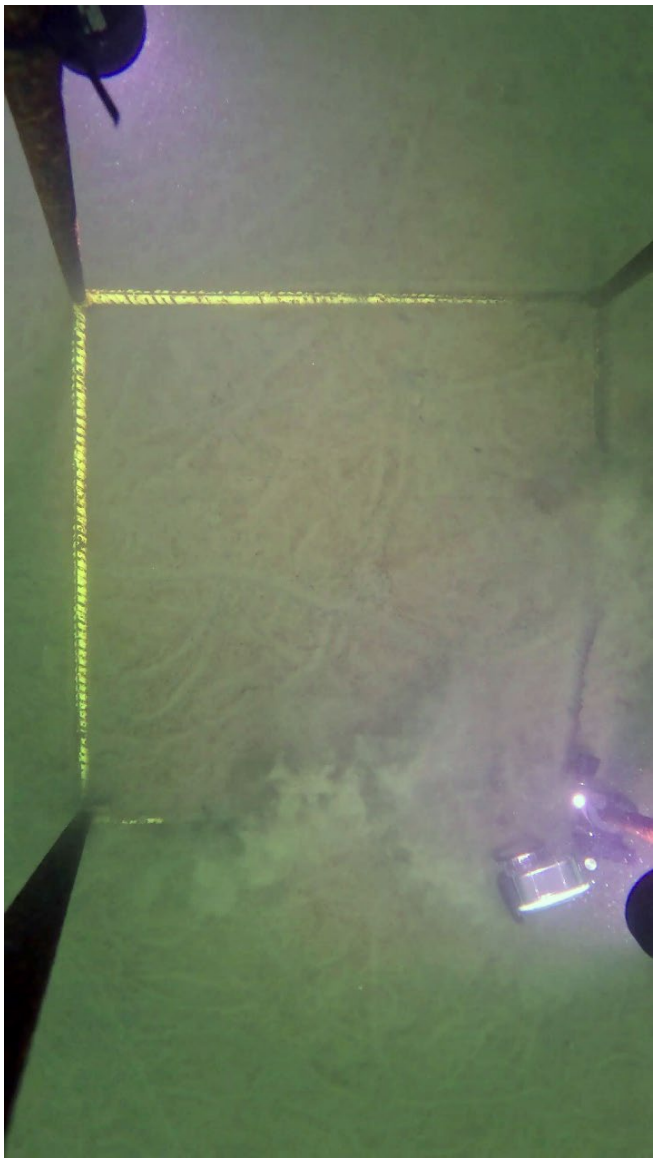
Survey Area:	***Downtown Waterfront***		Station:	***DT-10***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.364643*	Longitude (NAD83): *-71.049379*	Water Depth (FT): *-12.9*		

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.

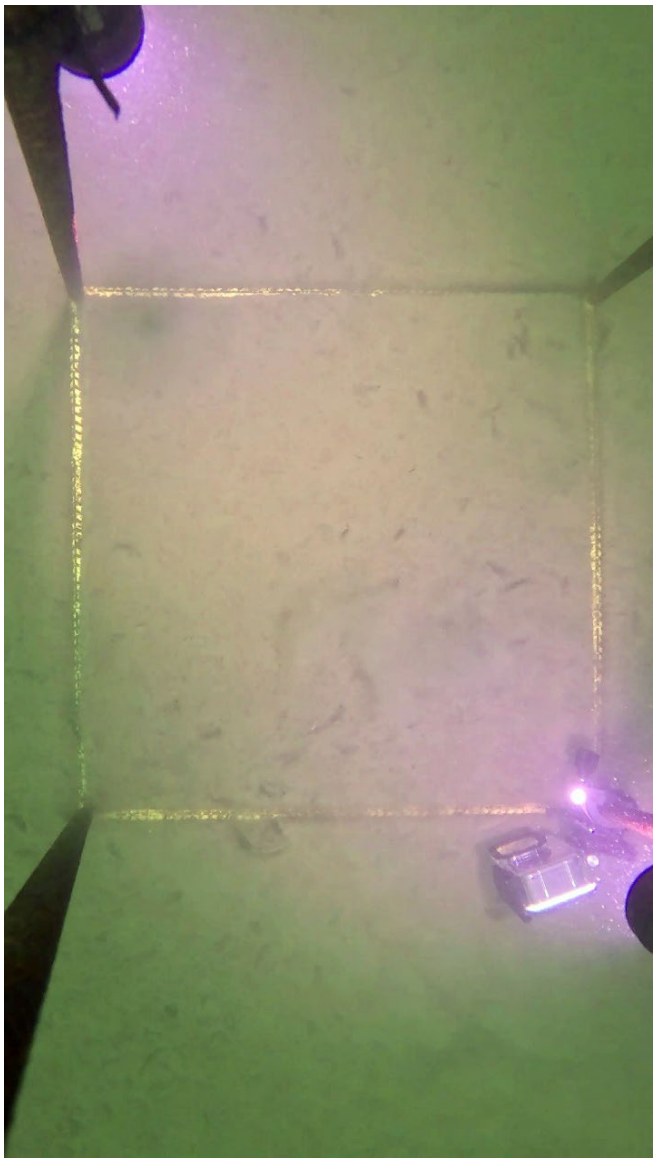
Survey Area:	***Downtown Waterfront***		Station:	***DT-11***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.364074*	Longitude (NAD83): *-71.048658*	Water Depth (FT): *-17.5*		

Plan View	Profile View
	

Notes:

Bare silt; epifaunal invertebrate tracks visible on sediment surface. Located near Sargent's Wharf.

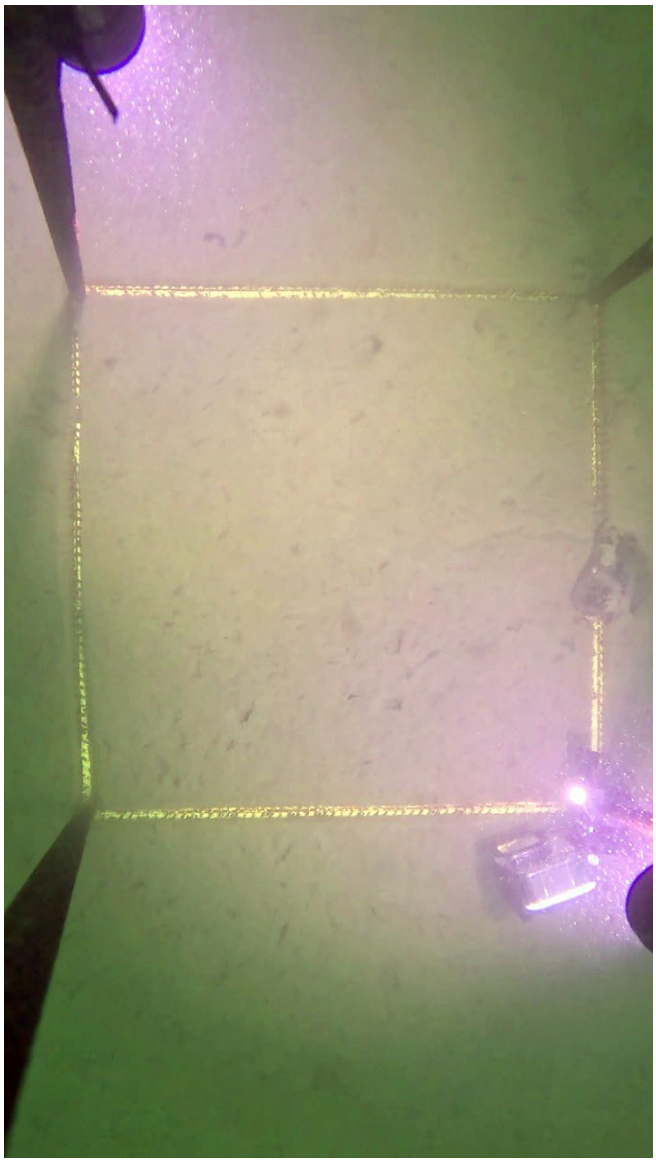
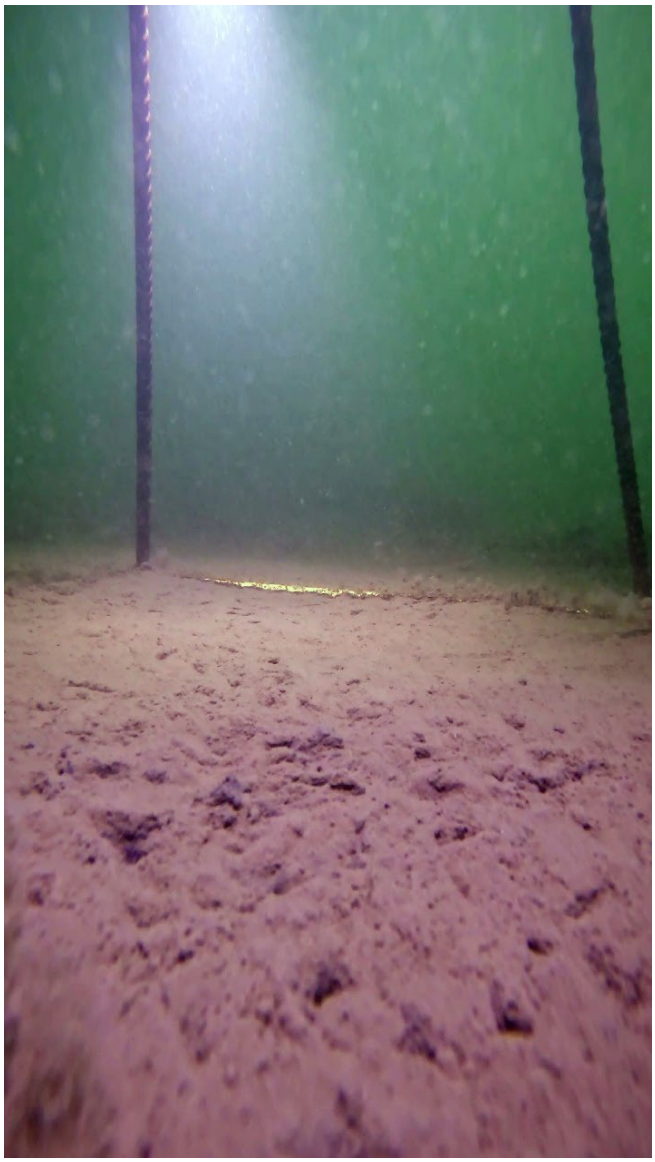
Survey Area:	***Downtown Waterfront***		Station:	***DT-12***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.363813*	Longitude (NAD83): *-71.048368*	Water Depth (FT): *-21.2*		

Plan View	Profile View
	

Notes:

Bare silt with infaunal invertebrate burrows and epifaunal invertebrate tracks. Located near Sargent's Wharf.

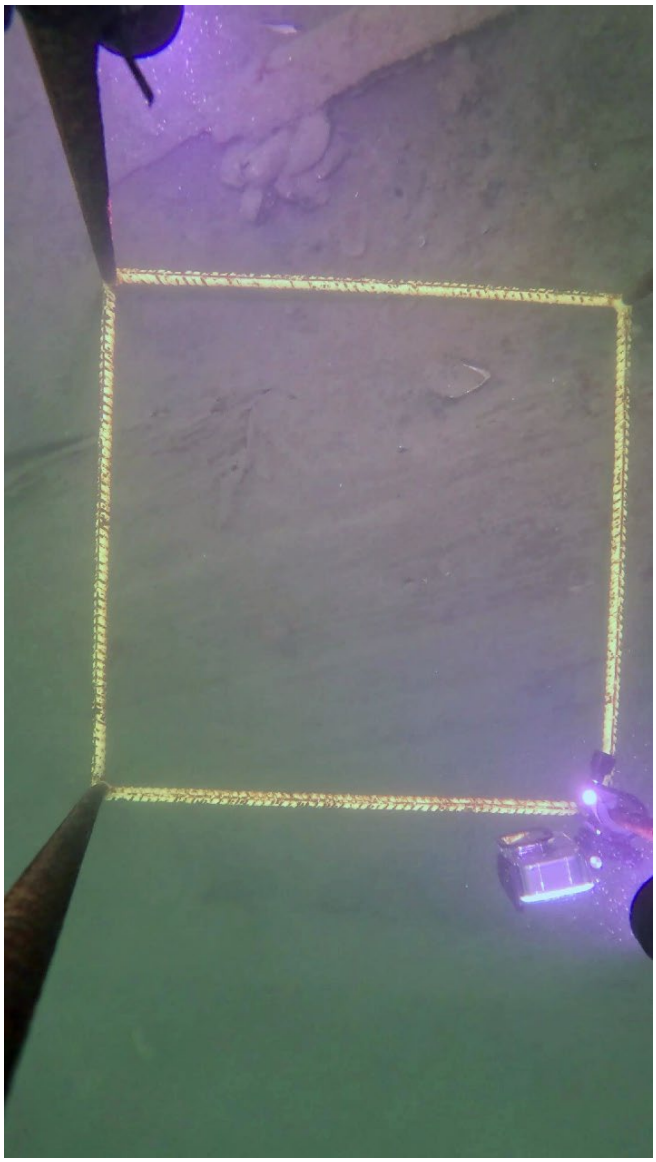
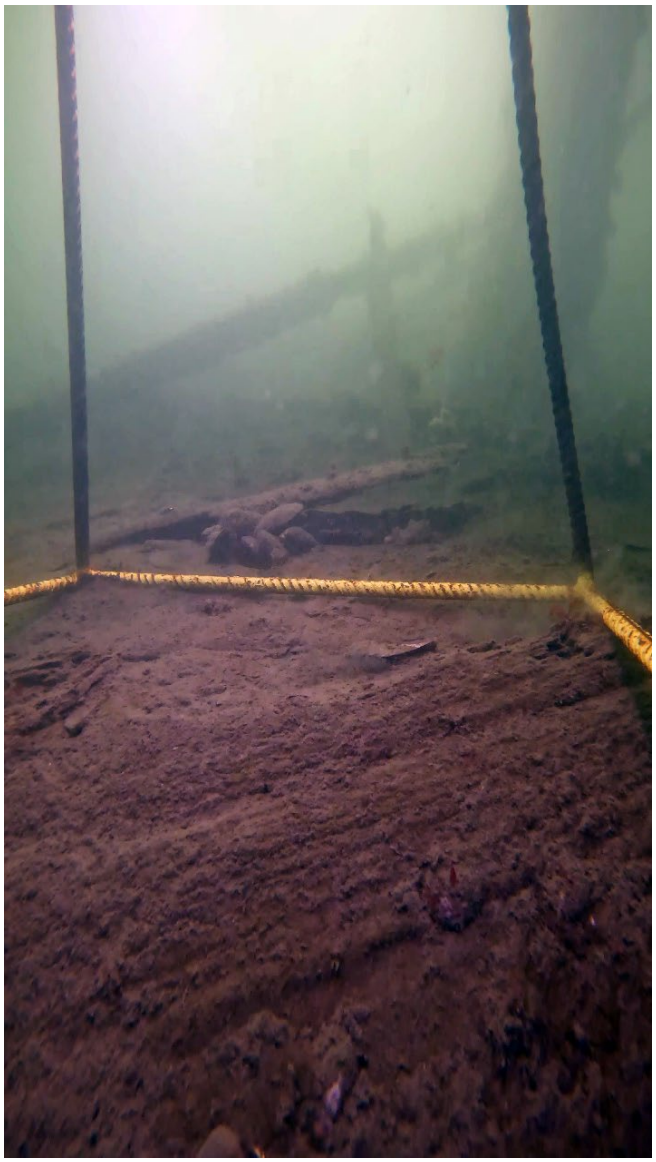
Survey Area:	***Downtown Waterfront***		Station:	***DT-13***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.363819*	Longitude (NAD83): *-71.047729*	Water Depth (FT): *-26.9*		

Plan View	Profile View
	

Notes:

Bare silt with infaunal invertebrate burrows. Anthropogenic debris visible in plan-view image. Located near Sargent's Wharf.

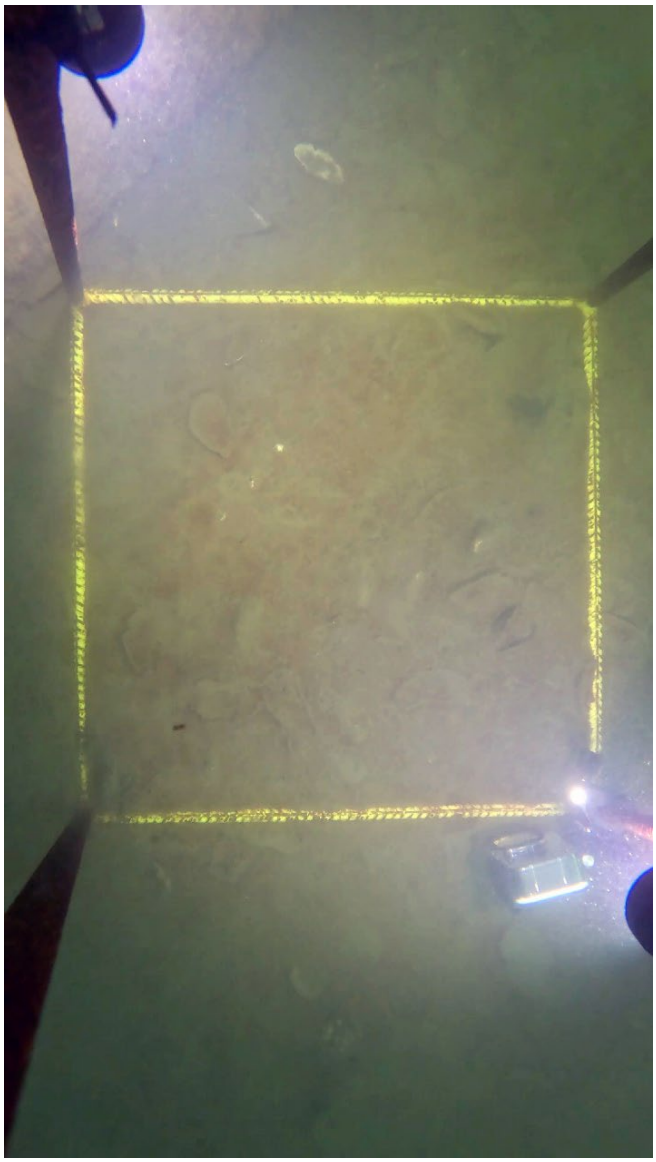
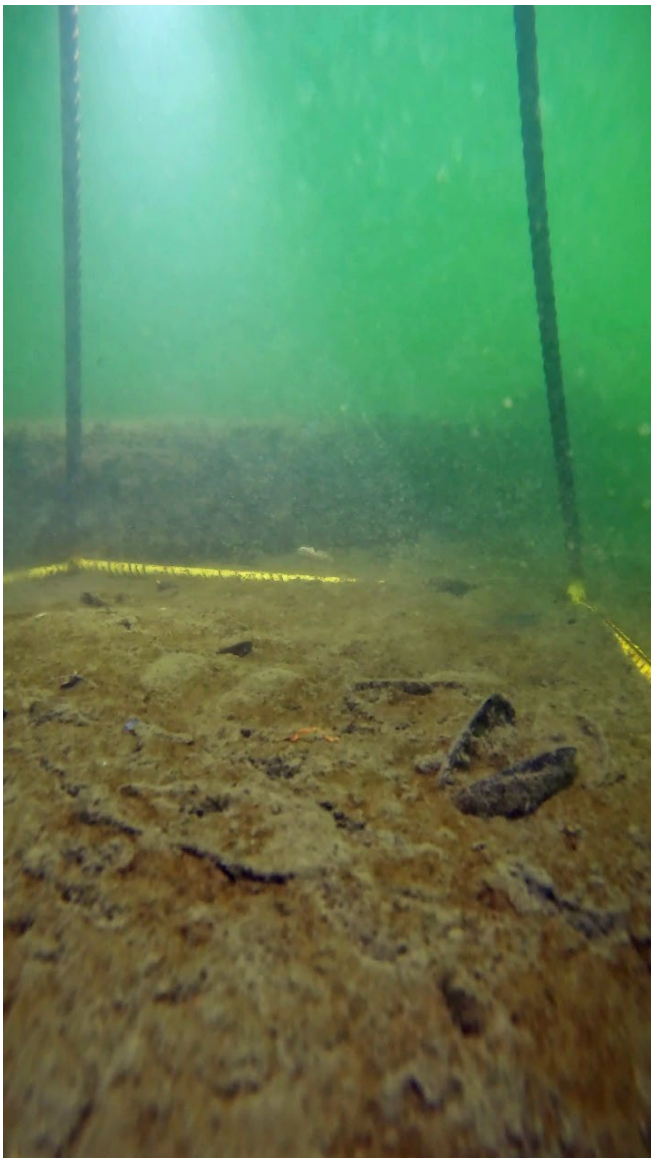
Survey Area:	***Downtown Waterfront***		Station:	***DT-14***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.362851*	Longitude (NAD83): *-71.048186*	Water Depth (FT): *-17.4*		

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.

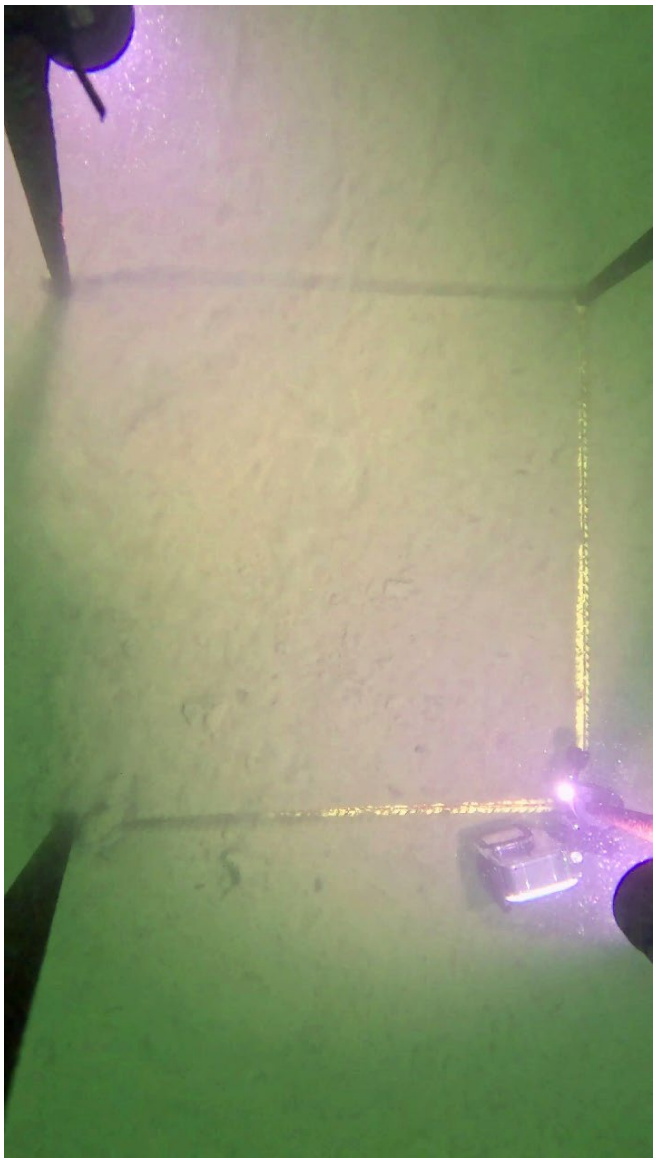
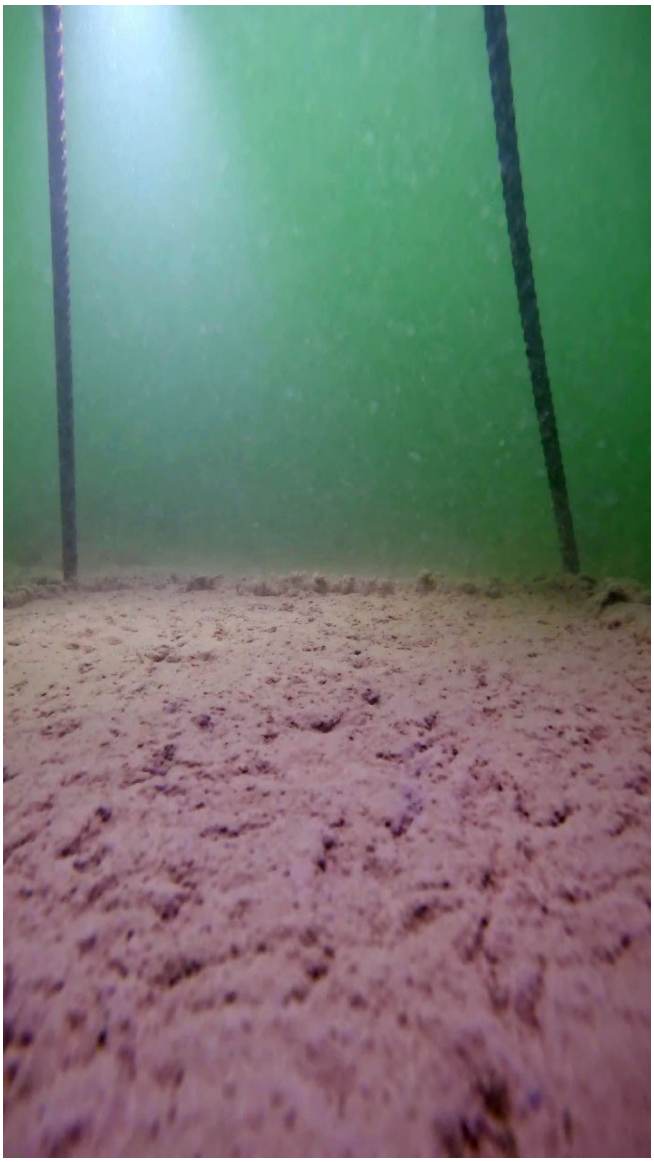
Survey Area:	***Downtown Waterfront***		Station:	***DT-15***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.362210*	Longitude (NAD83): *-71.049069*	Water Depth (FT): *-16.3*		

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.

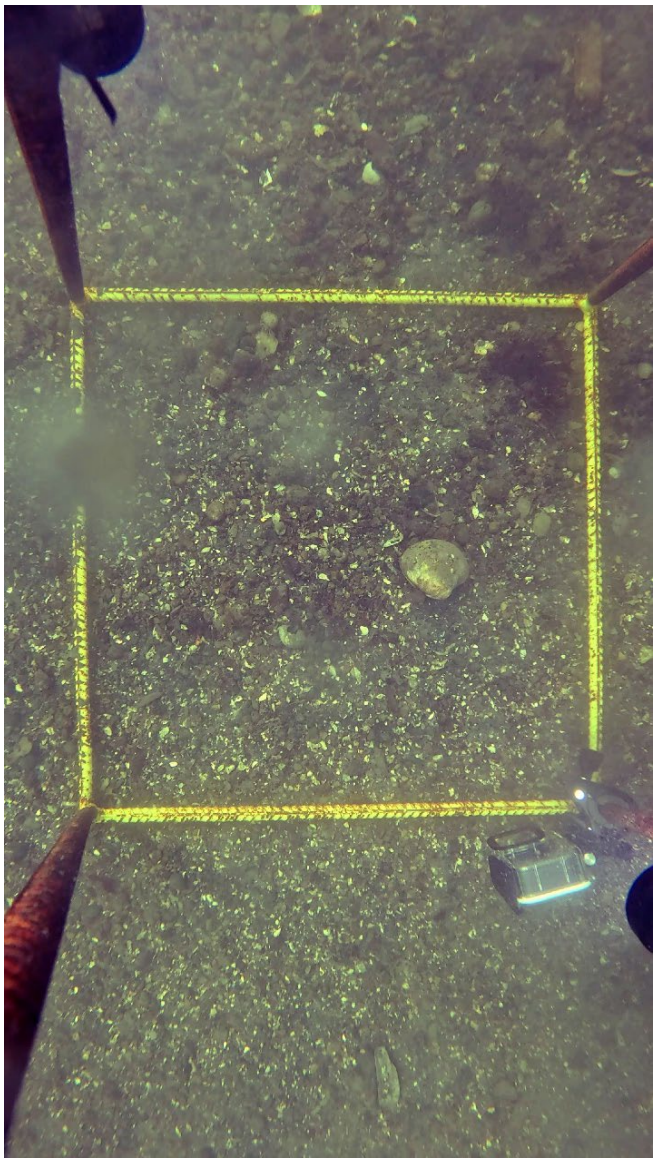
Survey Area:	***Downtown Waterfront***		Station:	***DT-16***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.361686*	Longitude (NAD83): *-71.046712*	Water Depth (FT): *-25.4*		

Plan View	Profile View
	

Notes:

Bare silt; small infaunal invertebrate tubes and burrows present. Located near Commercial Wharf.

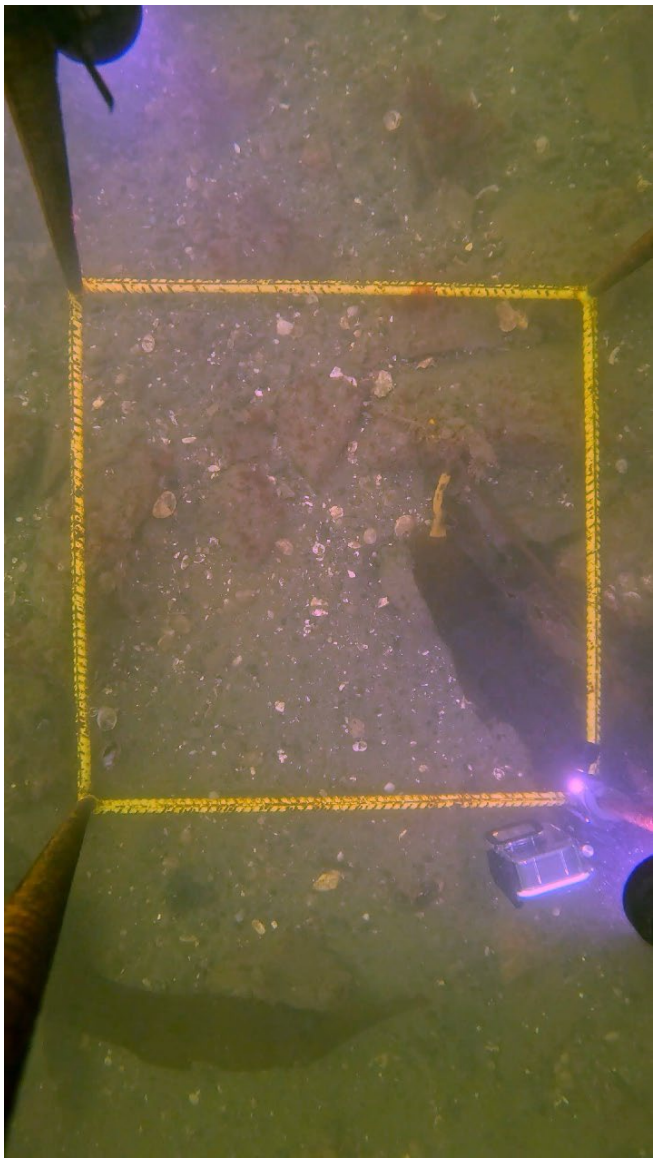
Survey Area:	***Downtown Waterfront***		Station:	***DT-17***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.361194*	Longitude (NAD83): *-71.050621*	Water Depth (FT): *-4.3*		

Plan View	Profile View
	

Notes:

Gravel with shell hash/rubble. Located between Commercial and Long Wharves, adjacent to Christopher Columbus Waterfront Park.

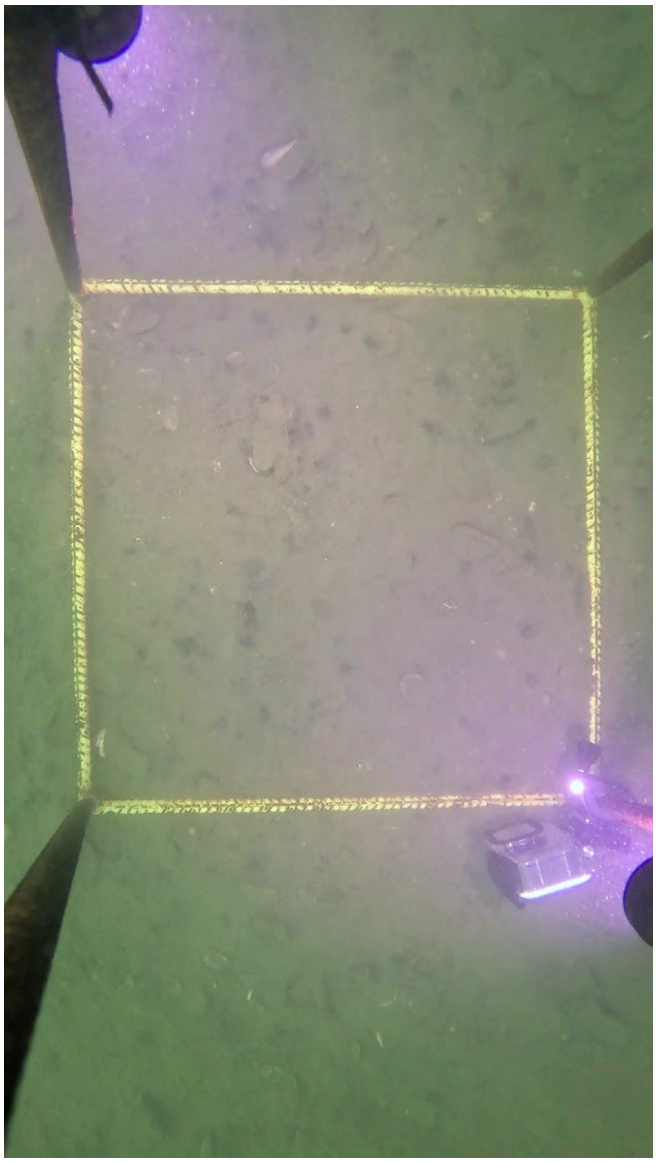
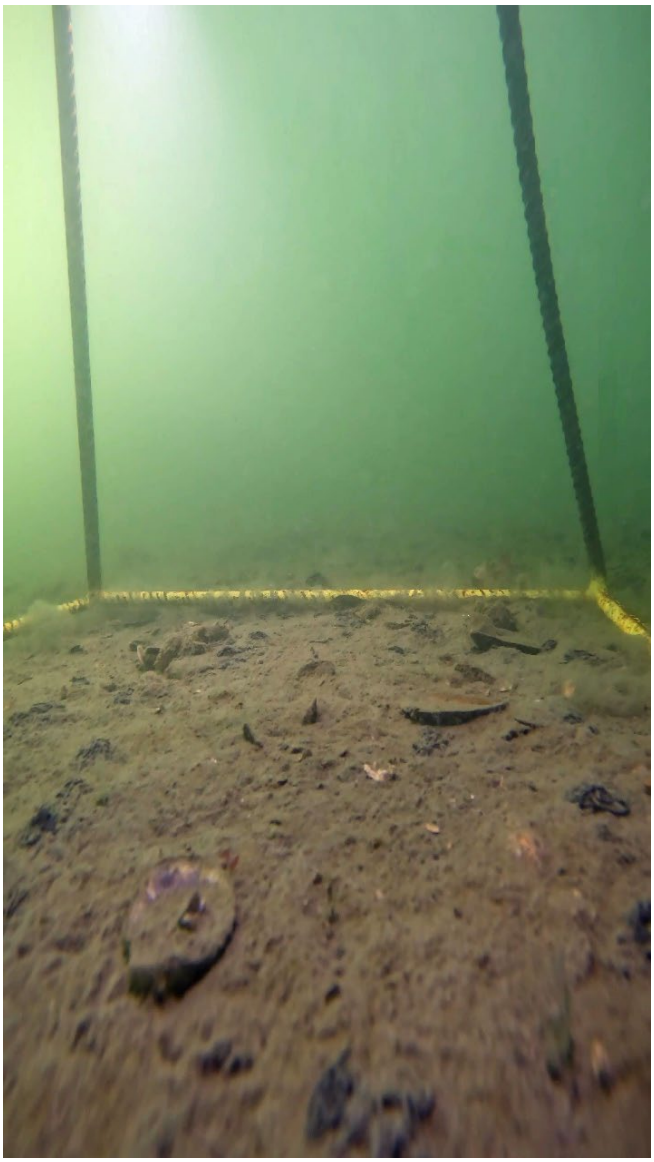
Survey Area:	***Downtown Waterfront***		Station:	***DT-18***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.361147*	Longitude (NAD83): *-71.048579*	Water Depth (FT): *-17.6*		

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.

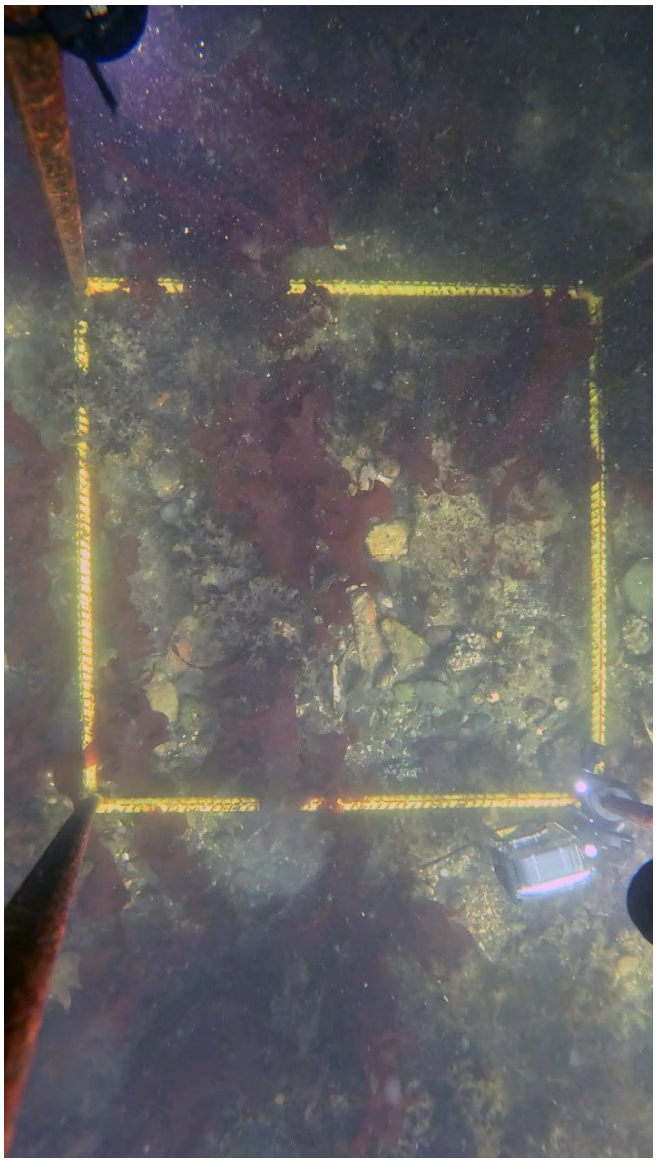
Survey Area:	***Downtown Waterfront***		Station:	***DT-19***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.360506*	Longitude (NAD83): *-71.047549*	Water Depth (FT): *-21.0*		

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.

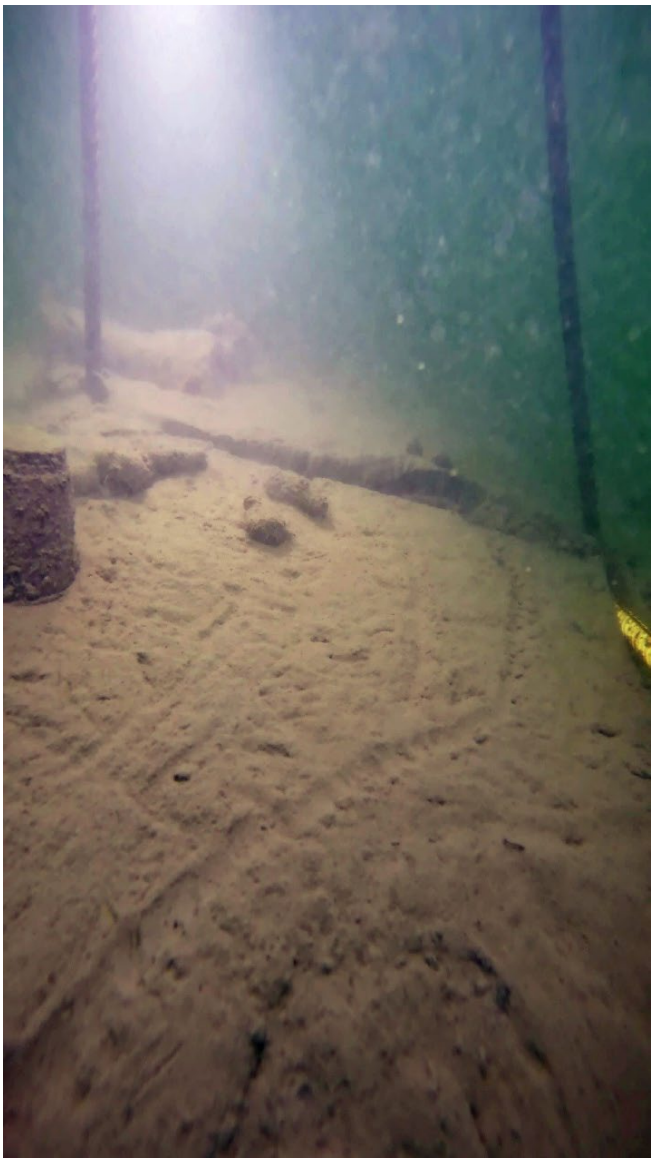
Survey Area:	***Downtown Waterfront***		Station:	***DT-20***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.359485*	Longitude (NAD83): *-71.048368*	Water Depth (FT): *-3.9*		

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.

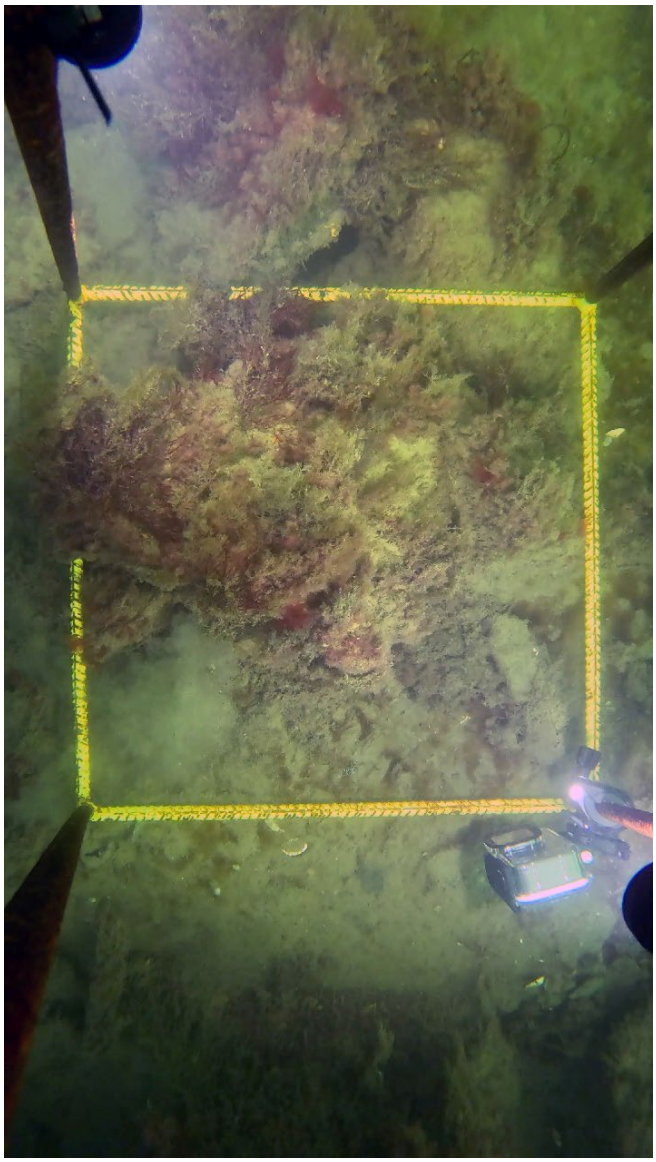
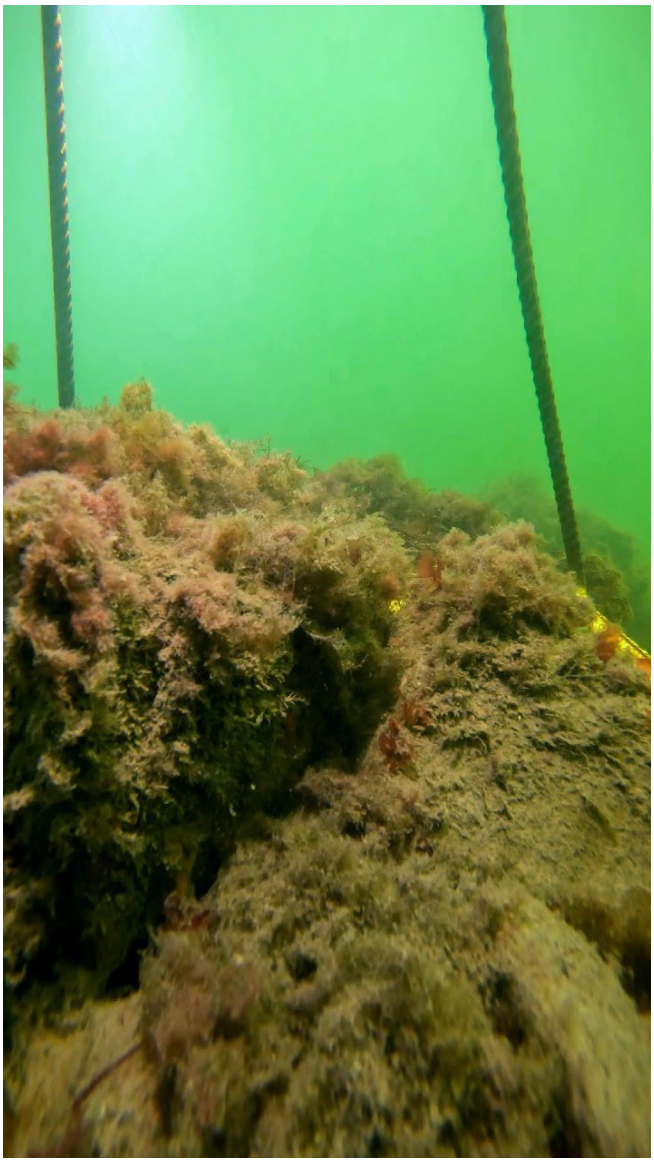
Survey Area:	***Downtown Waterfront***		Station:	***DT-21***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.358700*	Longitude (NAD83): *-71.048874*	Water Depth (FT): *-27.5*		

Plan View	Profile View
	

Notes:

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.

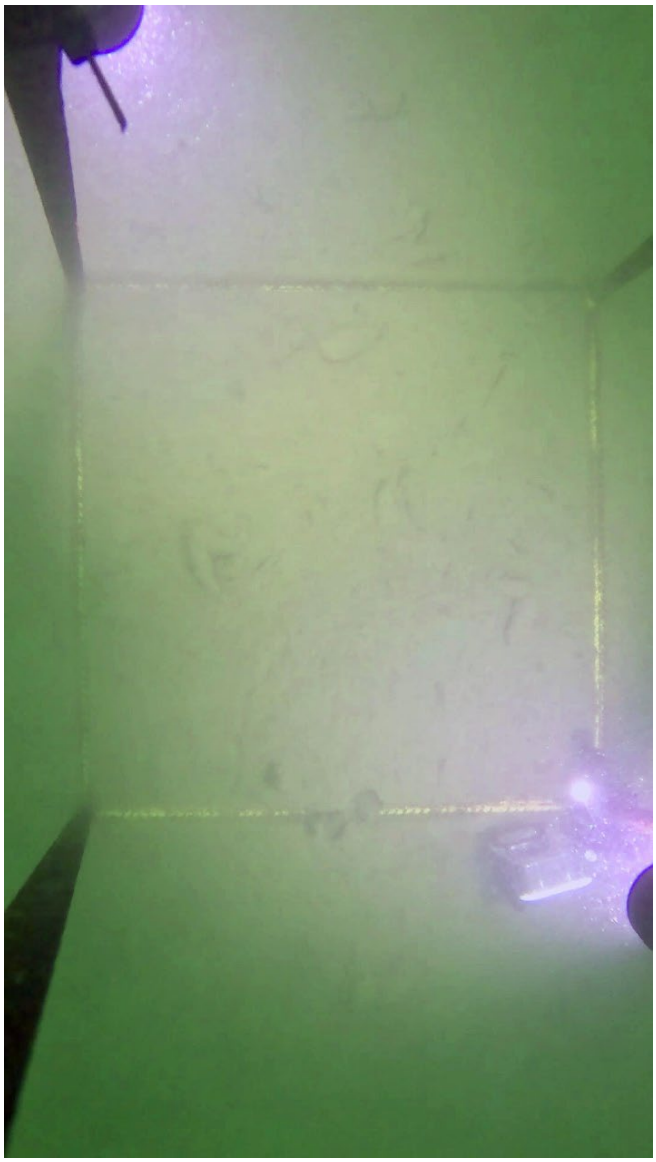
Survey Area:	***Downtown Waterfront***		Station:	***DT-22***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.358498*	Longitude (NAD83): *-71.050122*	Water Depth (FT): *-14.9*		

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.

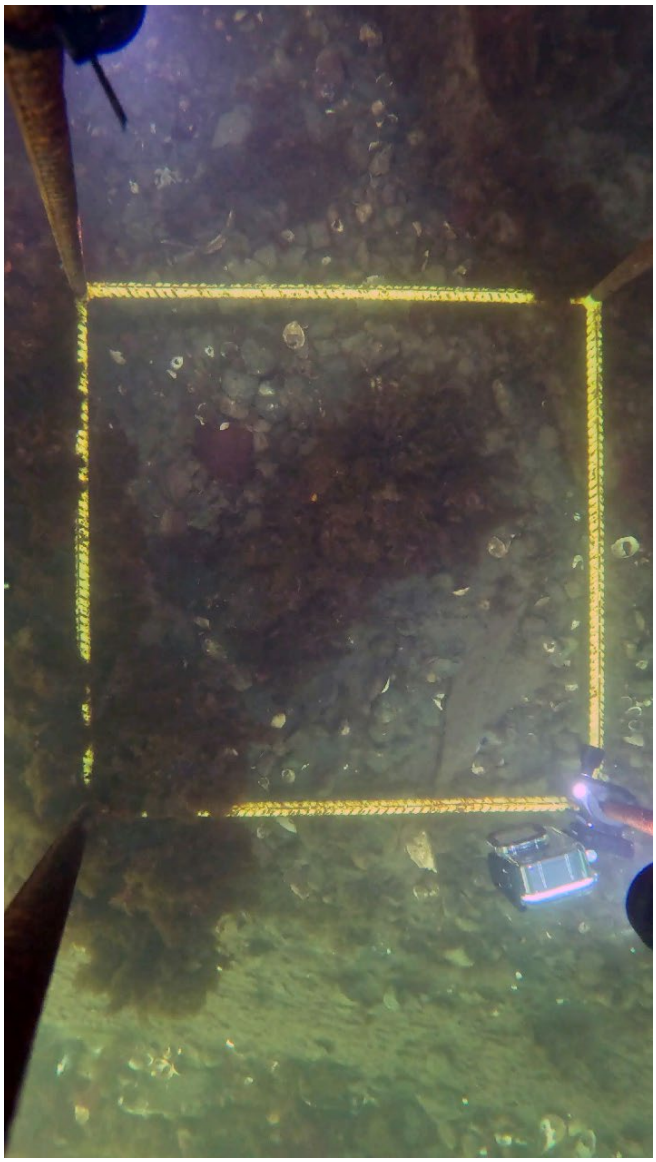
Survey Area:	***Downtown Waterfront***		Station:	***DT-23***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.358414*	Longitude (NAD83): *-71.047905*	Water Depth (FT): *-29.1*		

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
	

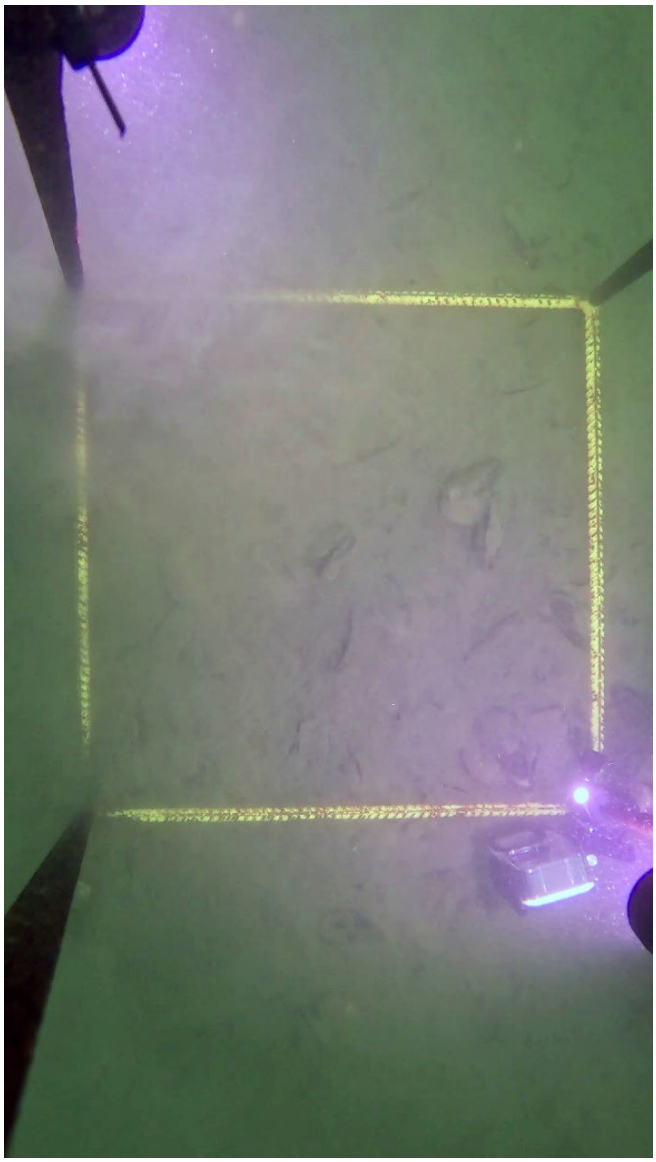
Notes:

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*

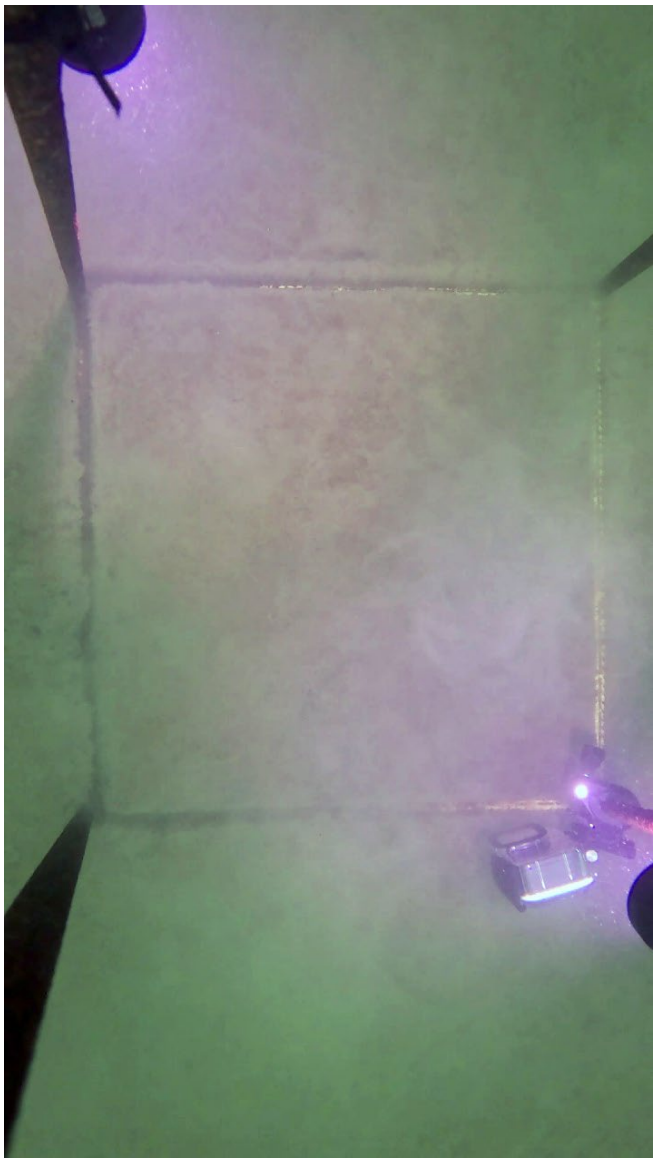
Latitude (NAD83): *42.356866*	Longitude (NAD83): *-71.049060*	Water Depth (FT): *-22.6*

Plan View	Profile View
	

Notes:

Silt with shell rubble. Located adjacent to Rowes Wharf.

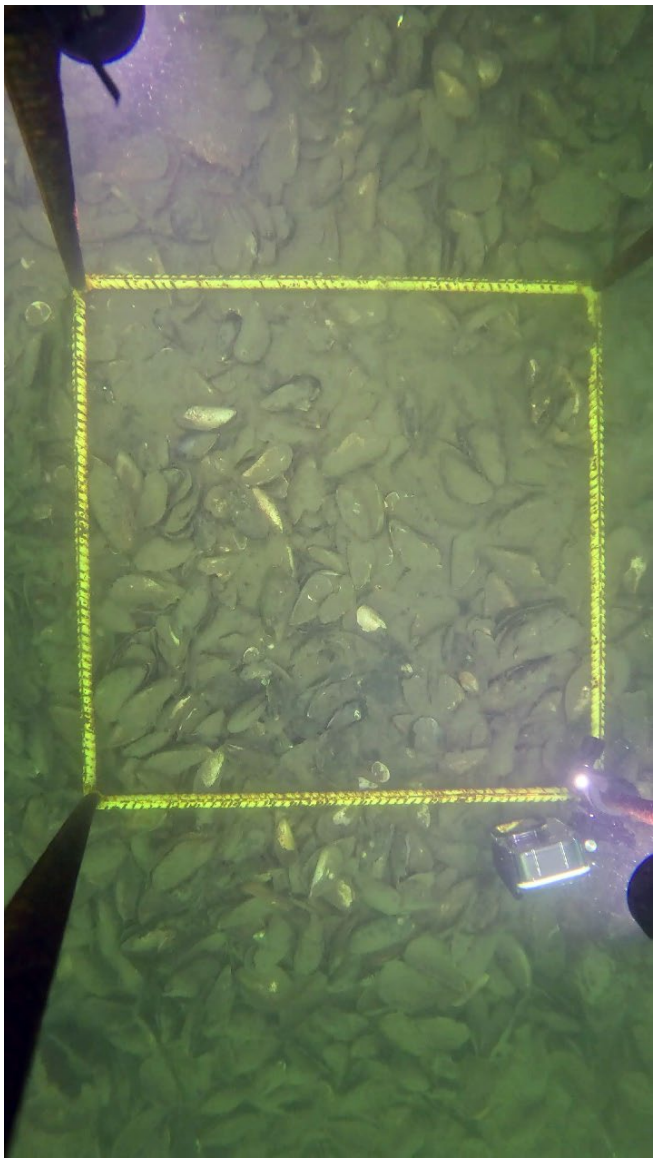
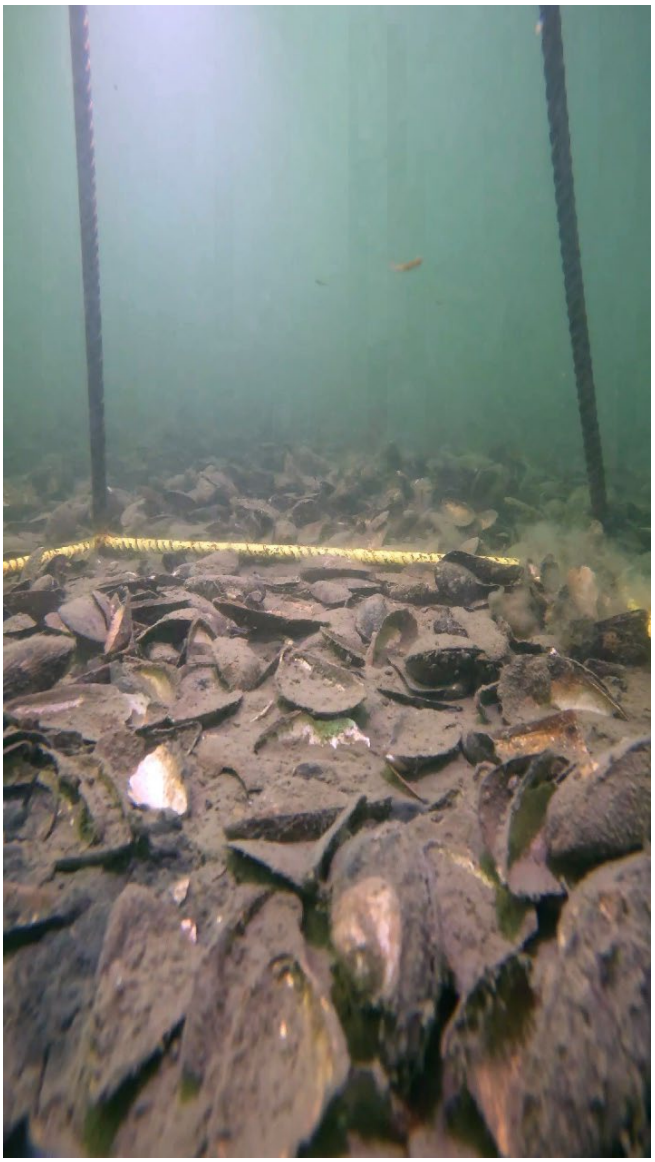
Survey Area:	***Downtown Waterfront***		Station:	***DT-26***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.356579*	Longitude (NAD83): *-71.048537*	Water Depth (FT): *-23.3*		

Plan View	Profile View
	

Notes:

Bare silt. Located near Rowes Wharf.

Survey Area:	***Downtown Waterfront***		Station:	***DT-27***
Date: *10/26/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.355759*	Longitude (NAD83): *-71.049640*	Water Depth (FT): *-19.4*		

Plan View	Profile View
	

Notes:

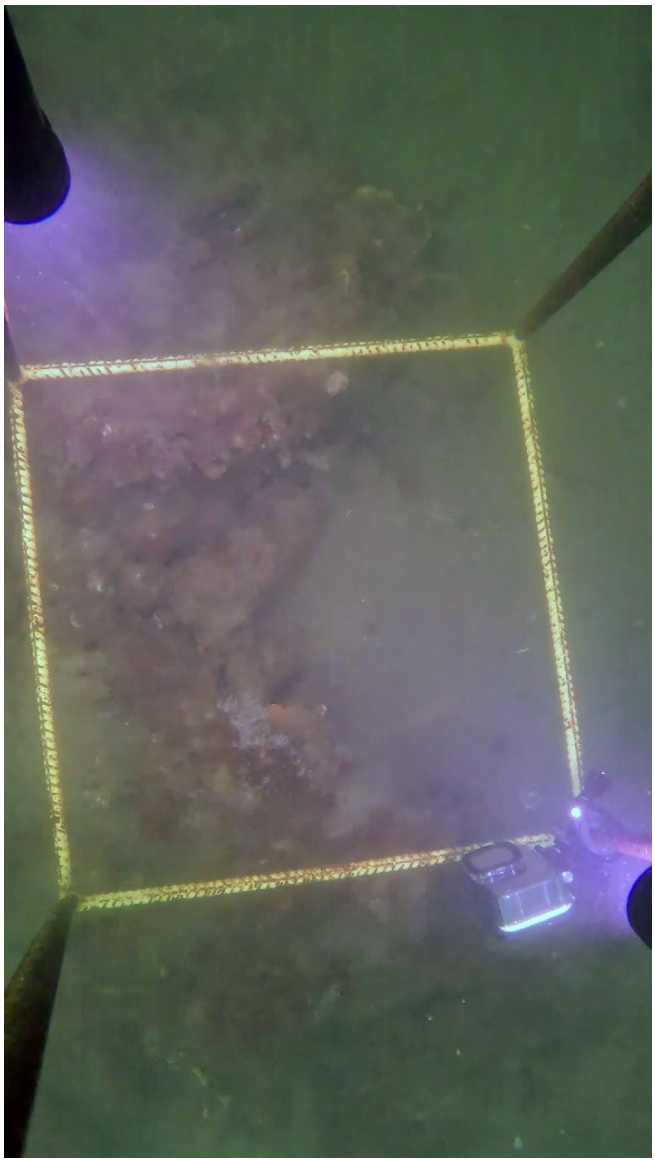
Shell rubble reef comprised of mostly mussel (Mytilidae spp.) shells. Located adjacent to Rowes Wharf, near the mouth of the Fort Point Channel.

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
	

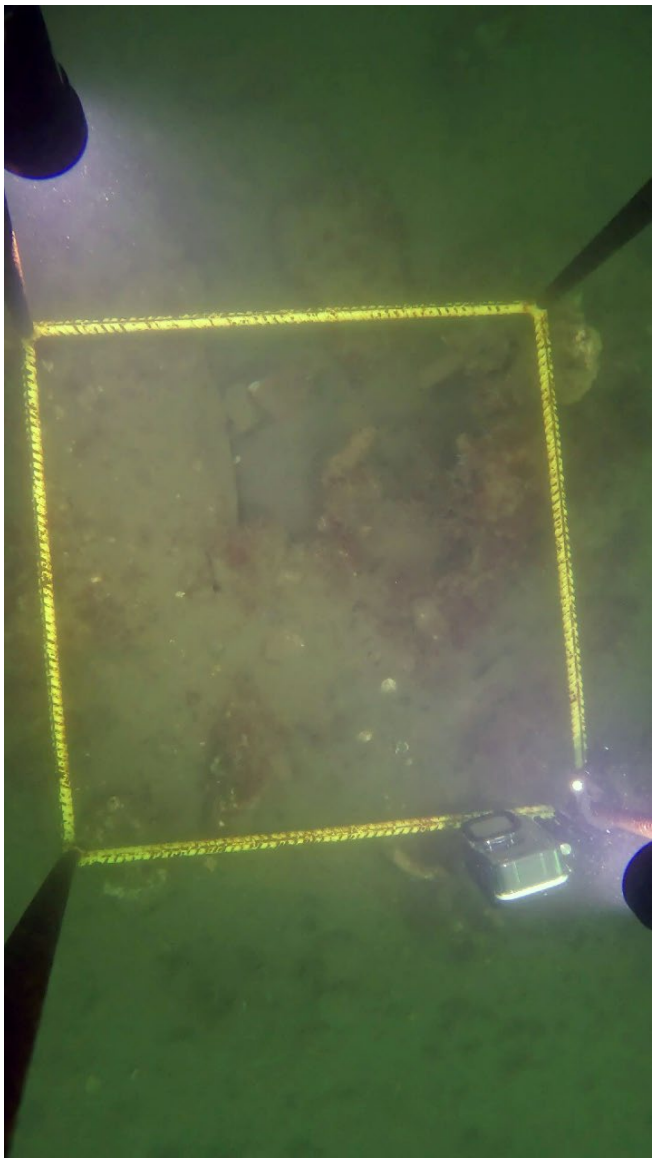
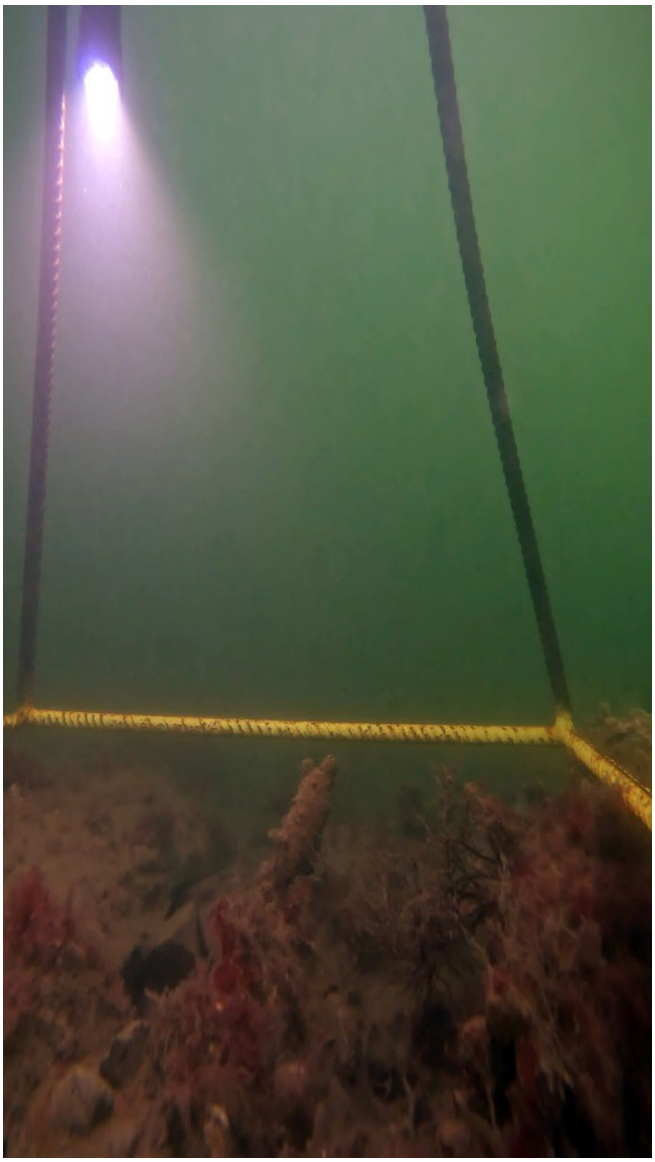
Notes:

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:	***Little Mystic Channel***	Transect:	***LM-1***	*Capture:*	***02***

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
	

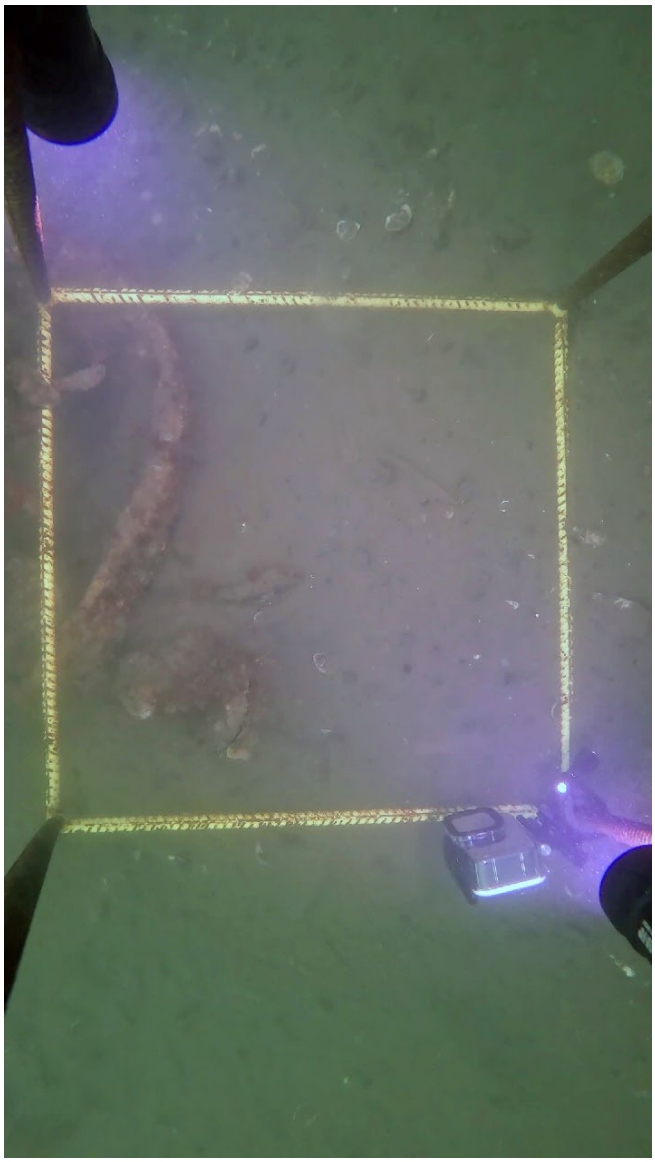
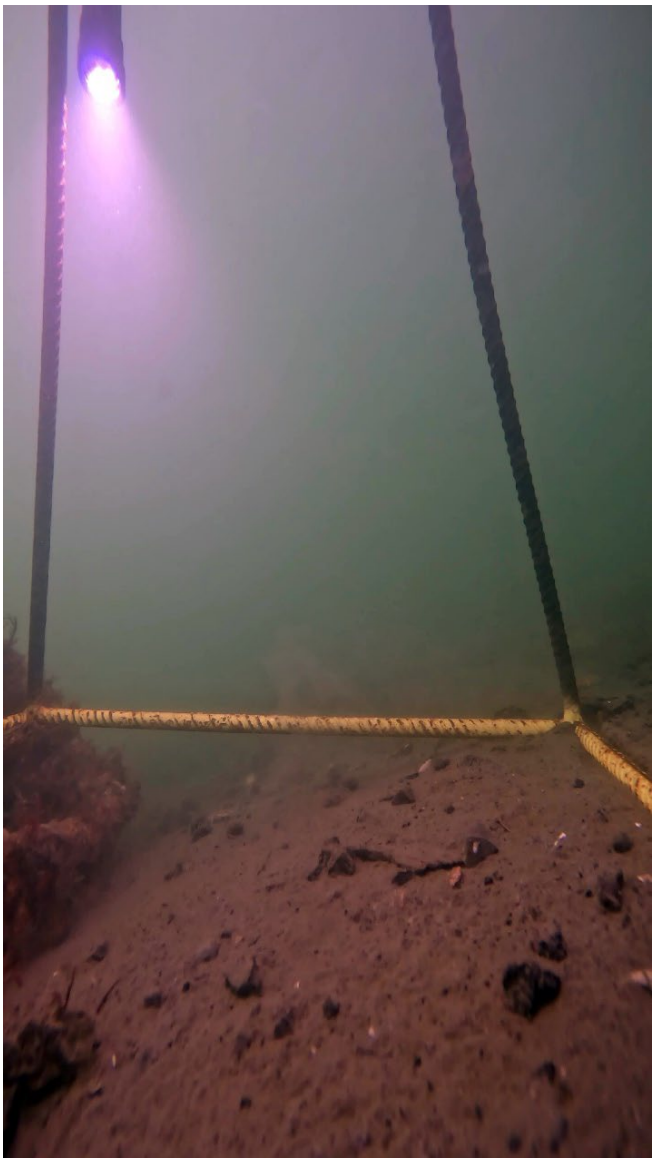
Notes:

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.

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*

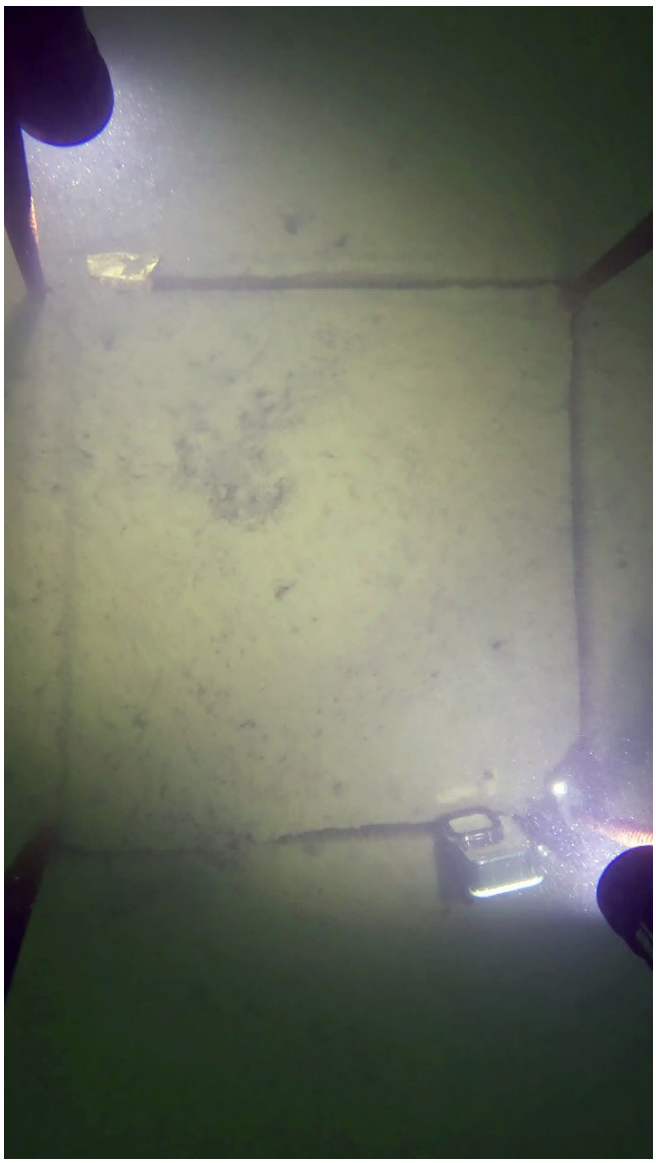
Start Coordinates (NAD83): *42.381162, -71.057460*	Stop Coordinates (NAD83): *42.381215, -71.057338*	Water Depth (FT): *-17.2*

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.

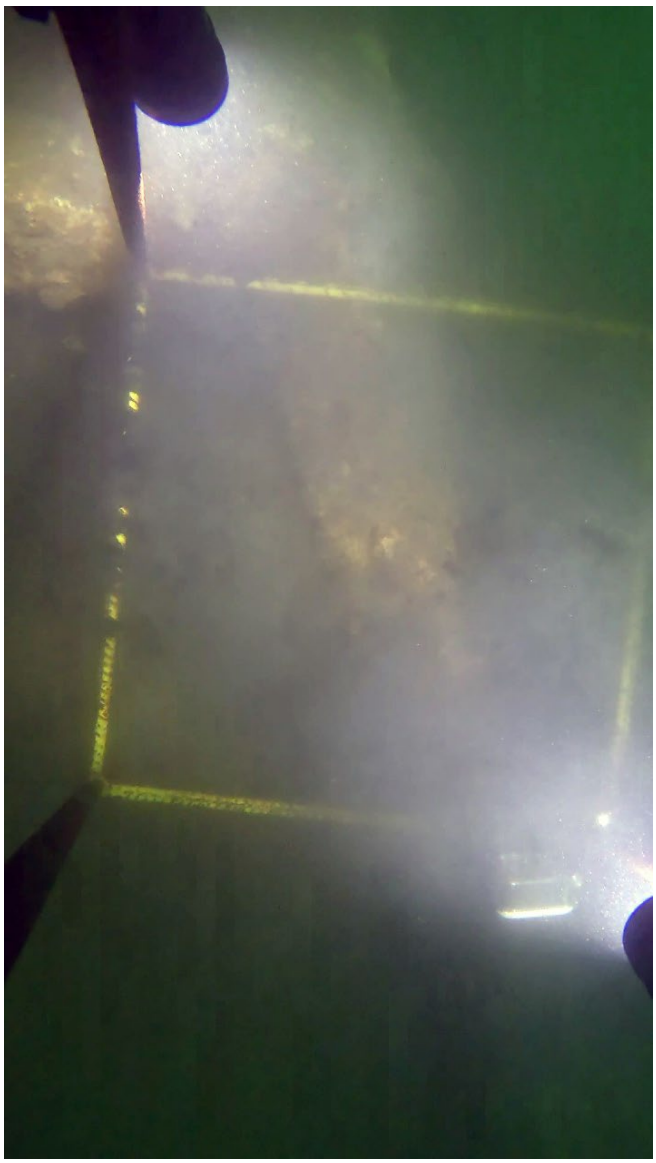
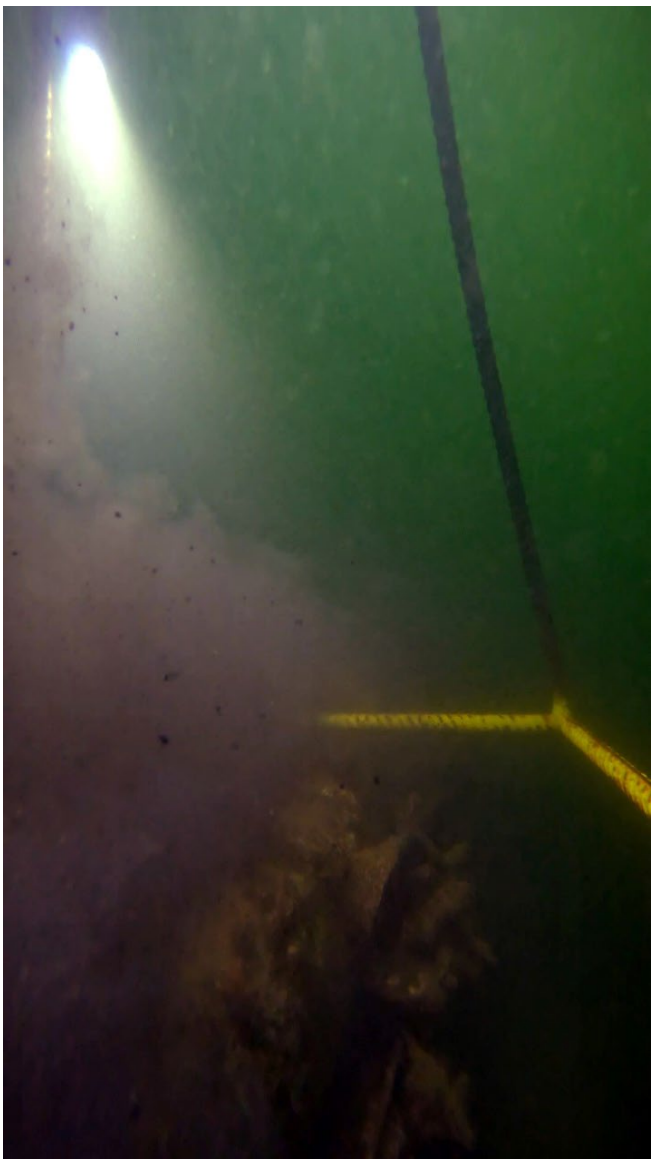
Survey Area:	***Little Mystic Channel***		Station:	***LM-2***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.380807*	Longitude (NAD83): *-71.056220*	Water Depth (FT): *-28.3*		

Plan View	Profile View
	

Notes:

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

Survey Area:	***Little Mystic Channel***		Station:	***LM-3***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.380961*	Longitude (NAD83): *-71.055945*	Water Depth (FT): *-27.2*		

Plan View	Profile View
	

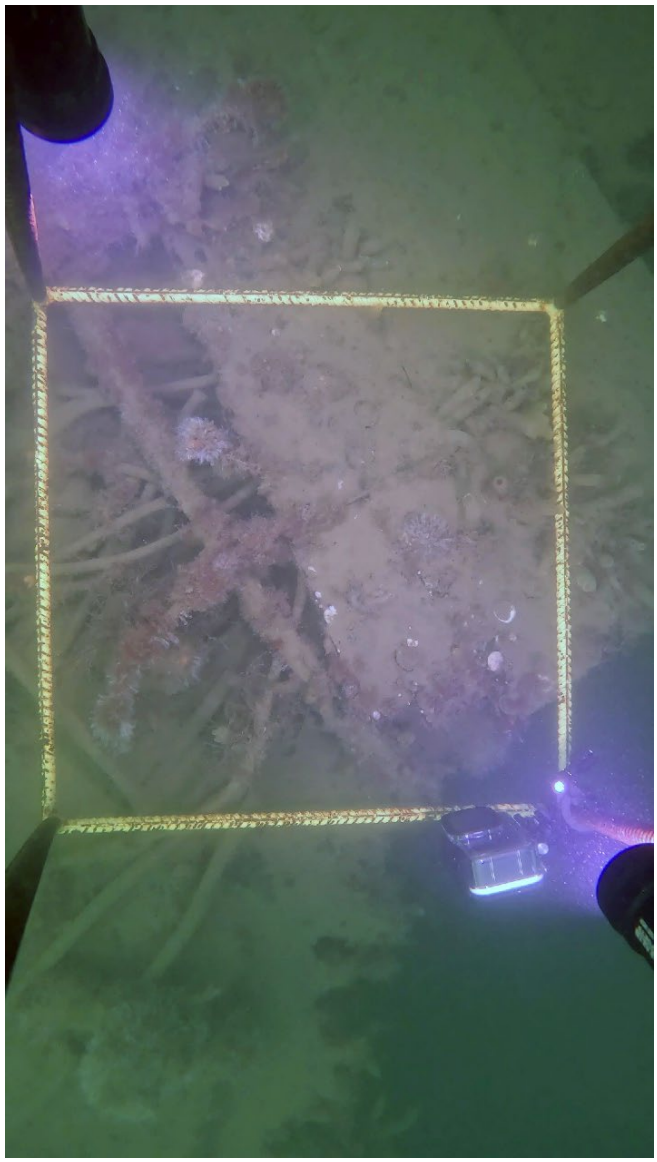
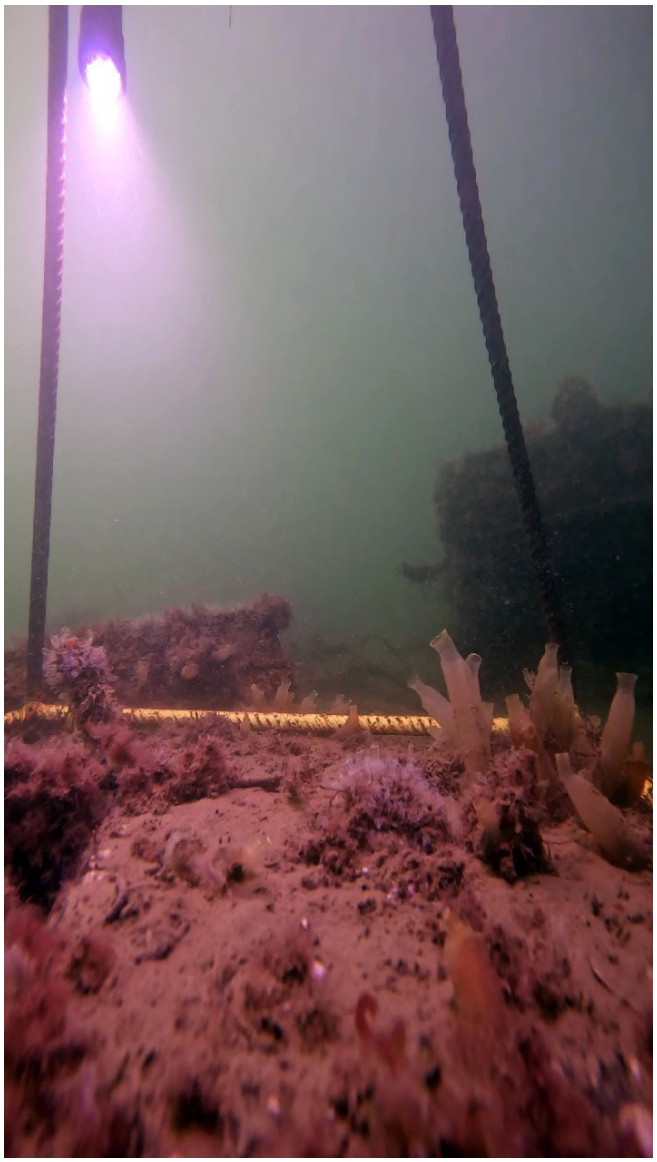
Notes:

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

Survey Area:	***l***	Transect:	***LM-4***	*Capture:*	***01***

Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*

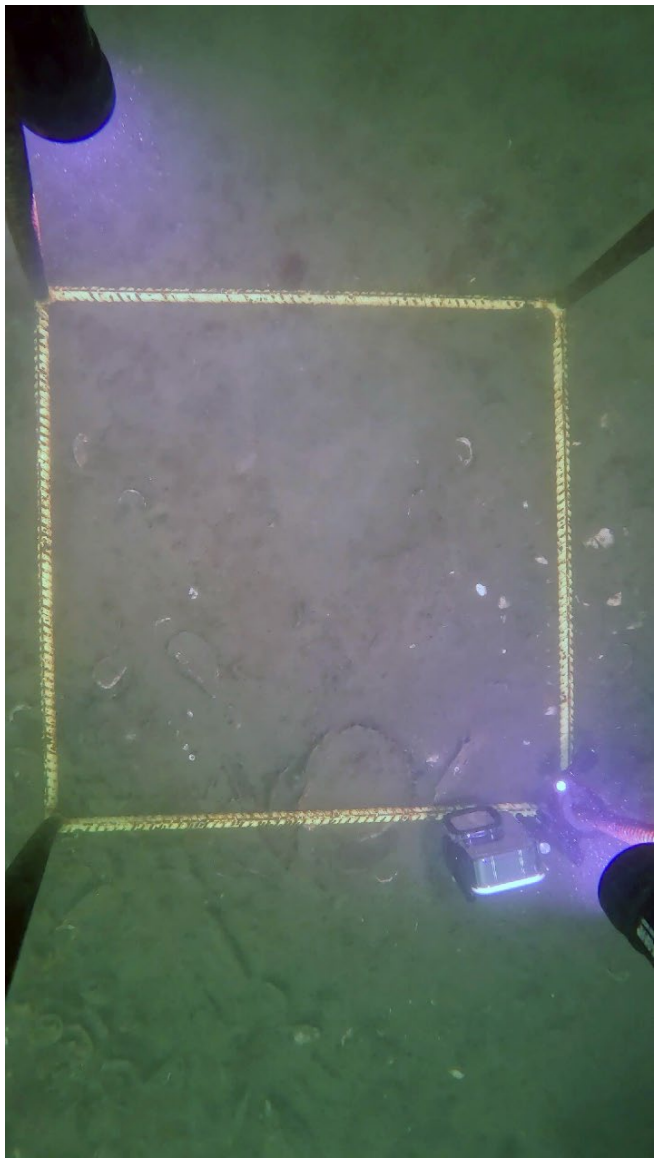
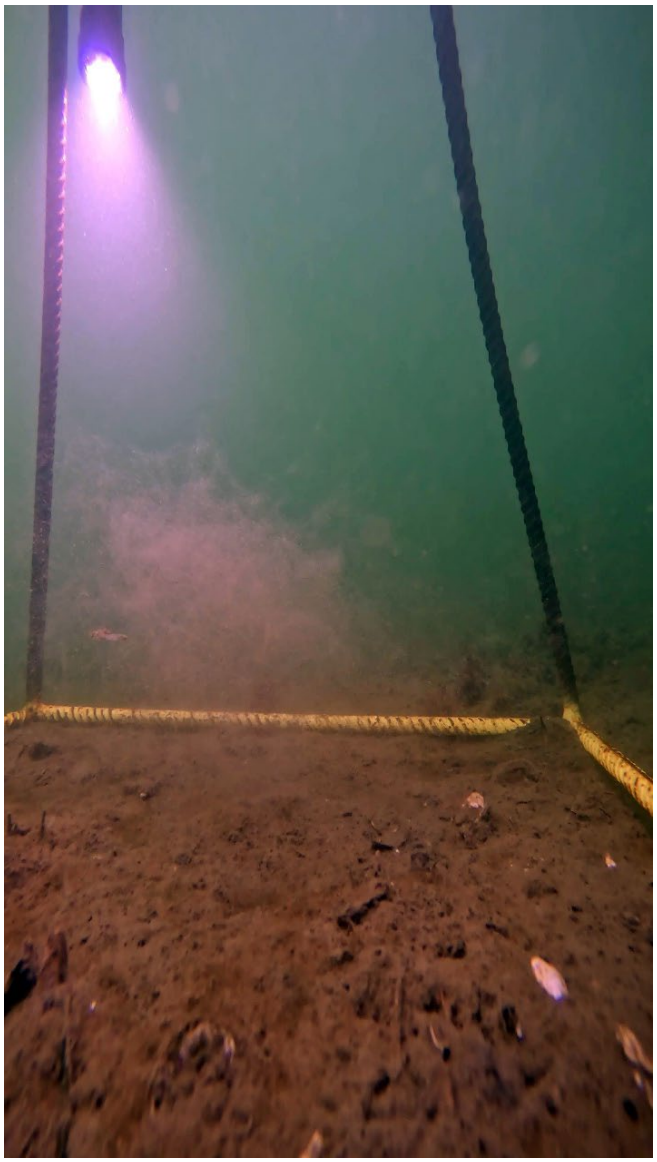
Start Coordinates (NAD83): *42.380870, -71.055729*	Stop Coordinates (NAD83): *42.380862, -71.055618*	Water Depth (FT): *-20.6*

Plan View	Profile View
	

Notes:

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.

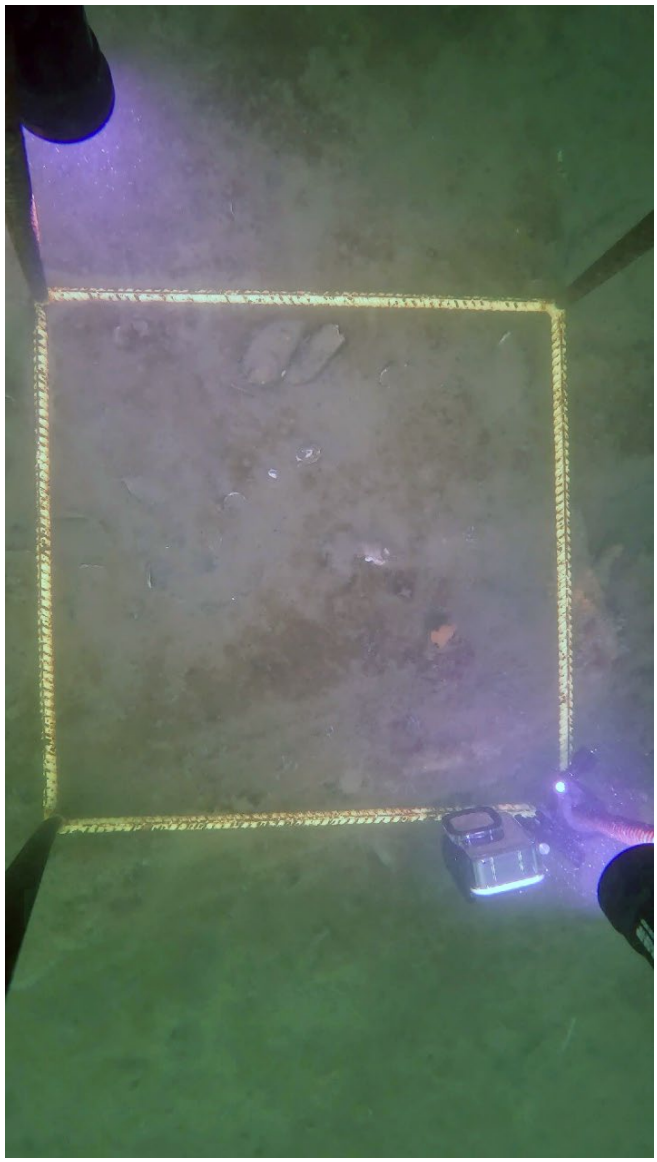
Survey Area:	***Little Mystic Channel***	Transect:	***LM-4***	*Capture:*	***02***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform:	*0.25m^2 drop frame - plan and profile cameras*		
Start Coordinates (NAD83): *42.380870, -71.055729*		Stop Coordinates (NAD83): *42.380862, -71.055618*		Water Depth (FT): *-20.6*	

Plan View	Profile View
	

Notes:

Deck of large sunken barge covered in silt and shell hash/rubble. Located towards the western end of Little Mystic Channel.

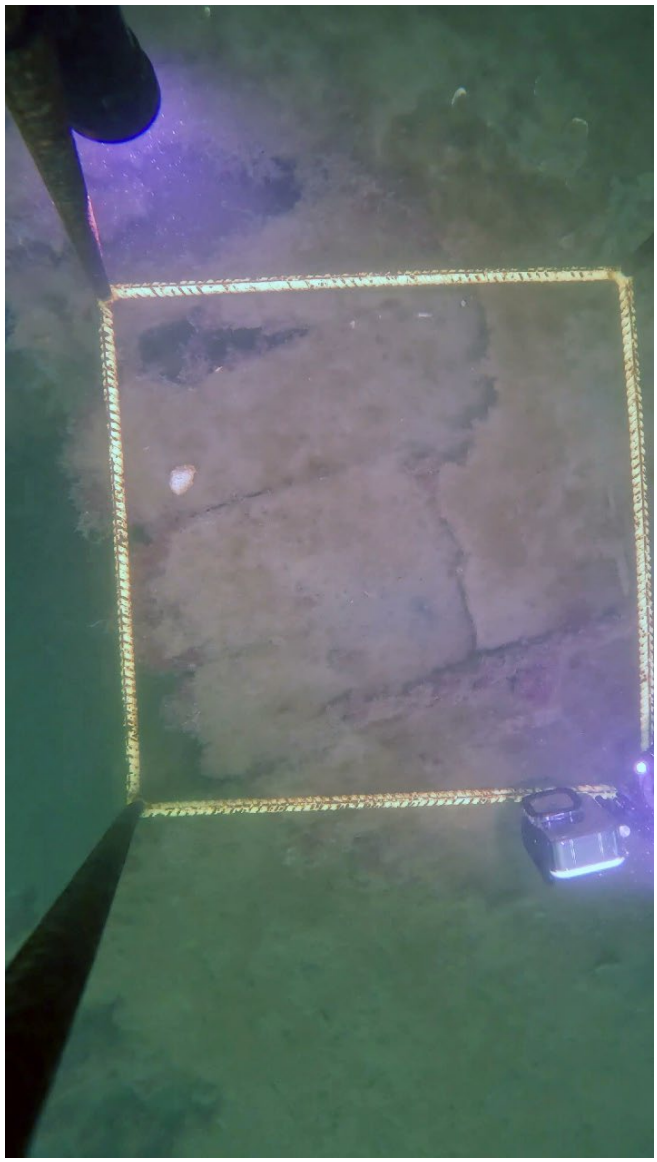
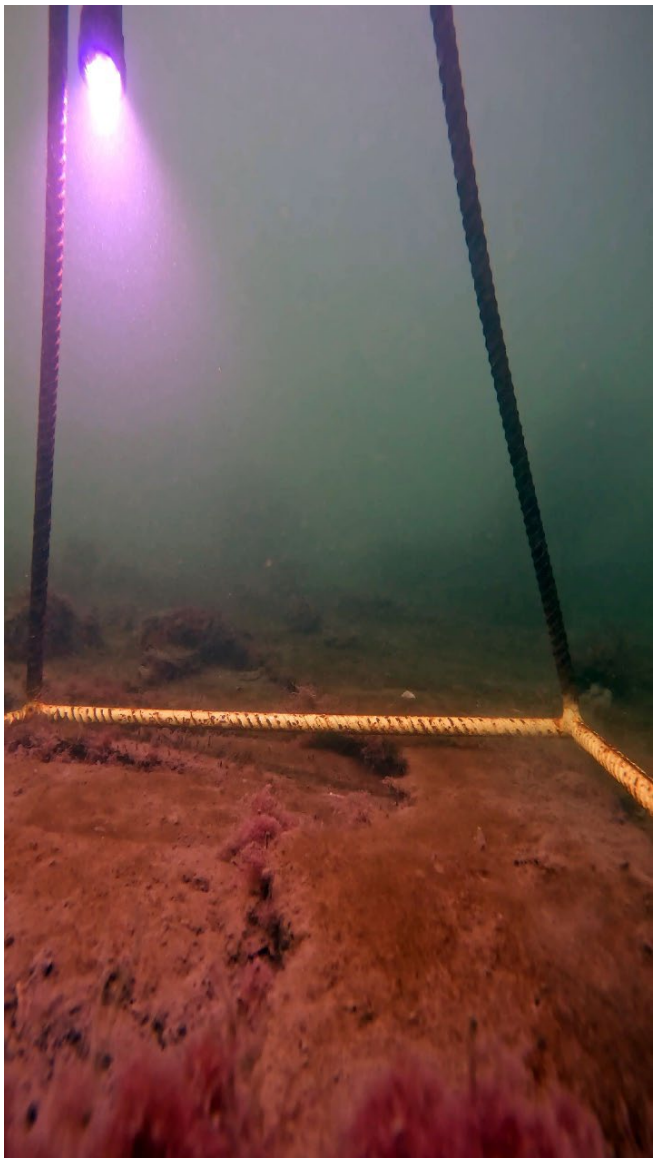
Survey Area:	***Little Mystic Channel***	Transect:	***LM-4***	*Capture:*	***03***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform:	*0.25m^2 drop frame - plan and profile cameras*		
Start Coordinates (NAD83): *42.380870, -71.055729*		Stop Coordinates (NAD83): *42.380862, -71.055618*		Water Depth (FT): *-20.6*	

Plan View	Profile View
	

Notes:

Deck of large sunken barge covered 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.

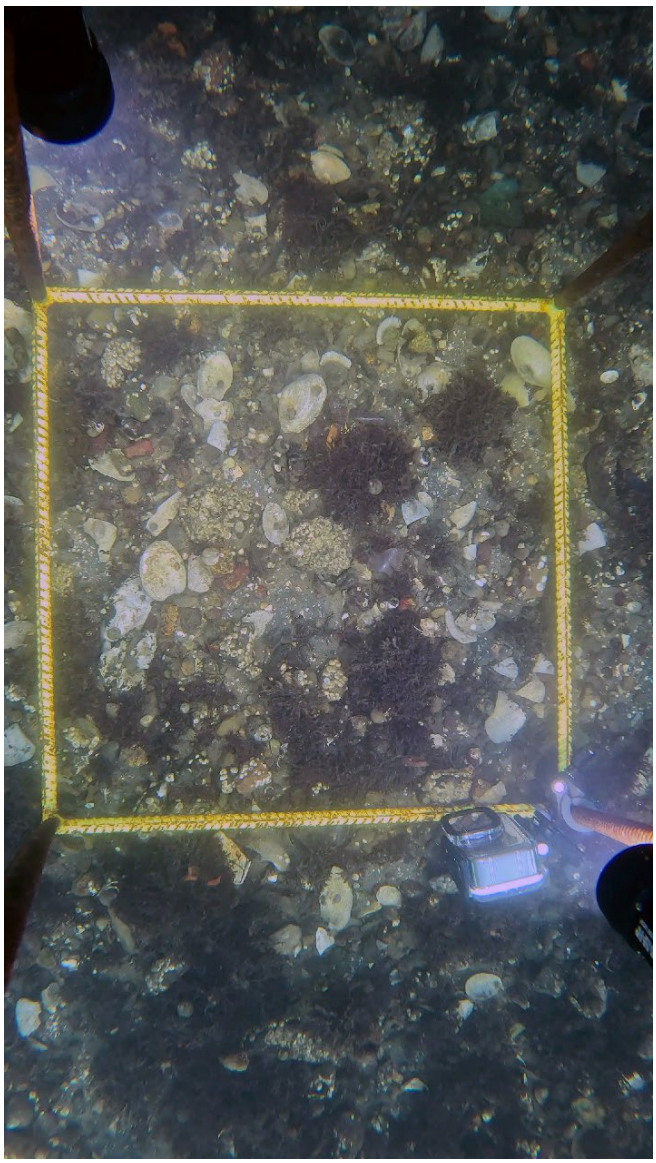
Survey Area:	***Little Mystic Channel***	Transect:	***LM-4***	*Capture:*	***04***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform:	*0.25m^2 drop frame - plan and profile cameras*		
Start Coordinates (NAD83): *42.380870, -71.055729*		Stop Coordinates (NAD83): *42.380862, -71.055618*		Water Depth (FT): *-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.

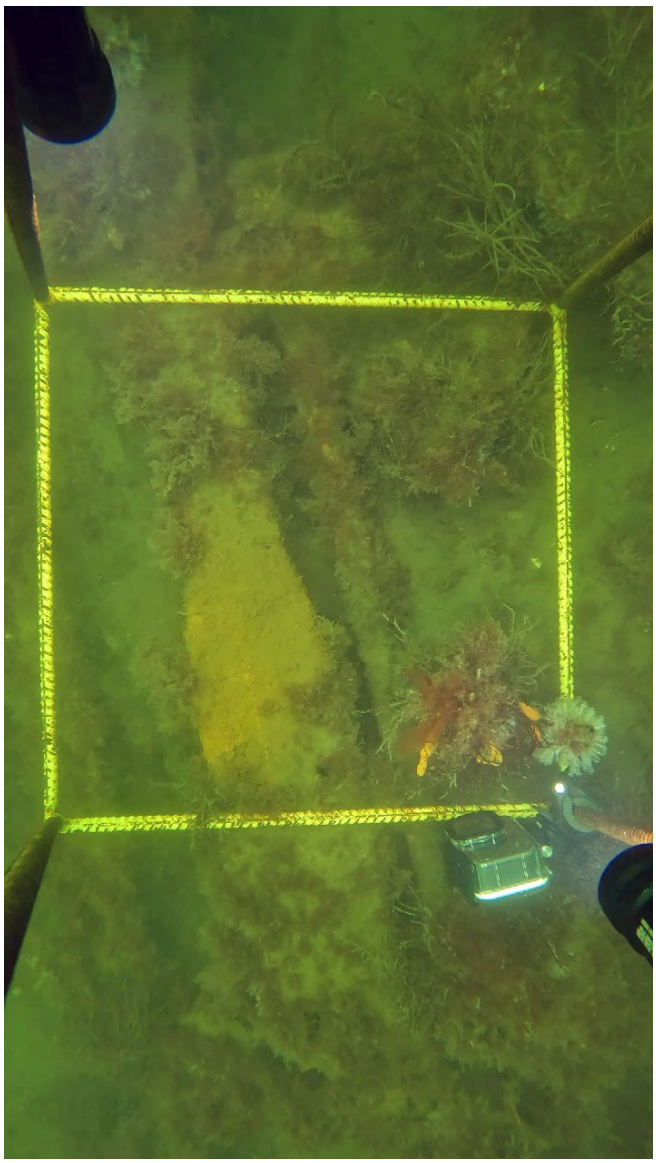
Survey Area:	***Little Mystic Channel***		Station:	***LM-5***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.380051*	Longitude (NAD83): *-71.053372*	Water Depth (FT): *-3.4*		

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.

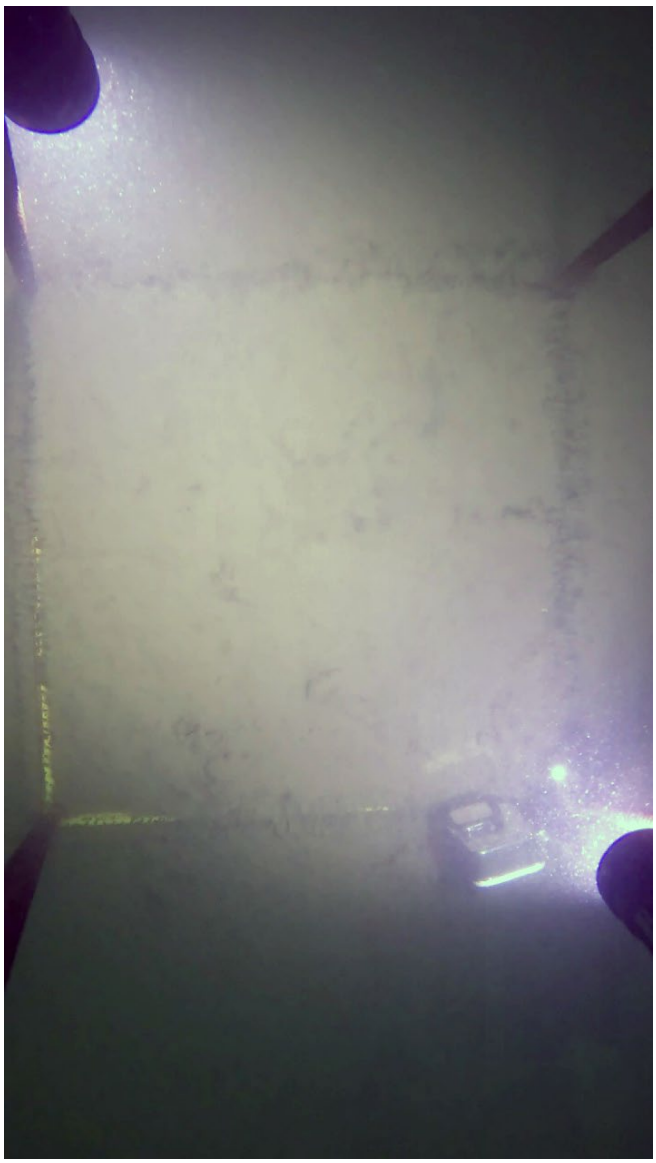
Survey Area:	***Little Mystic Channel***		Station:	***LM-6***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.380764*	Longitude (NAD83): *-71.052789*	Water Depth (FT): *-10.6*		

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.

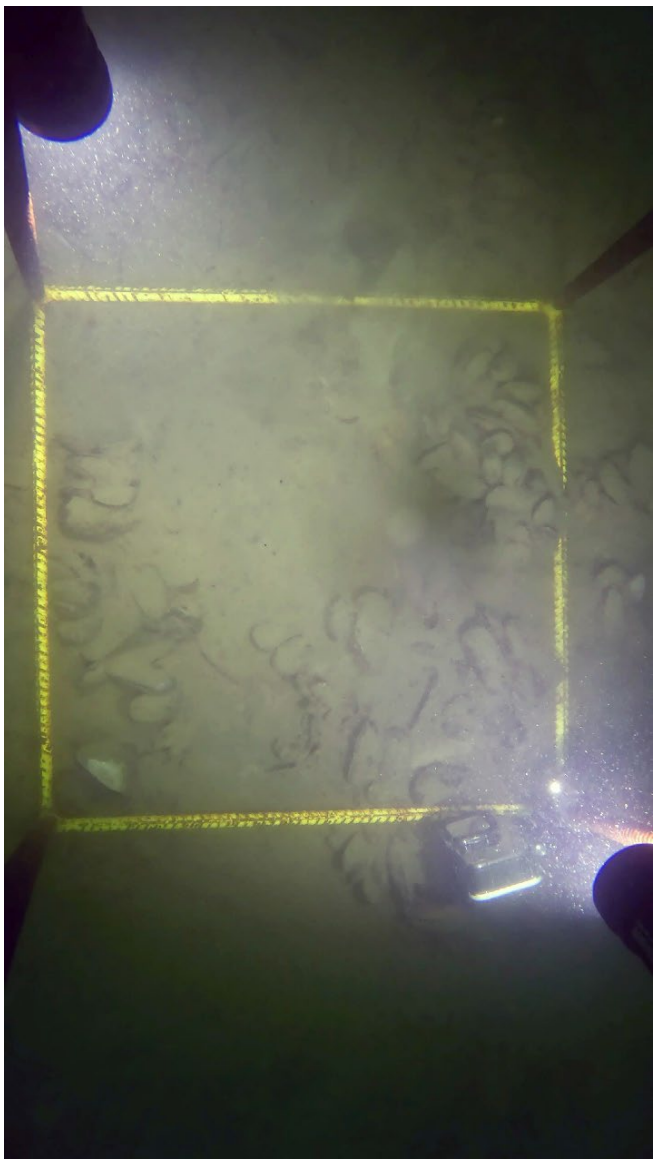
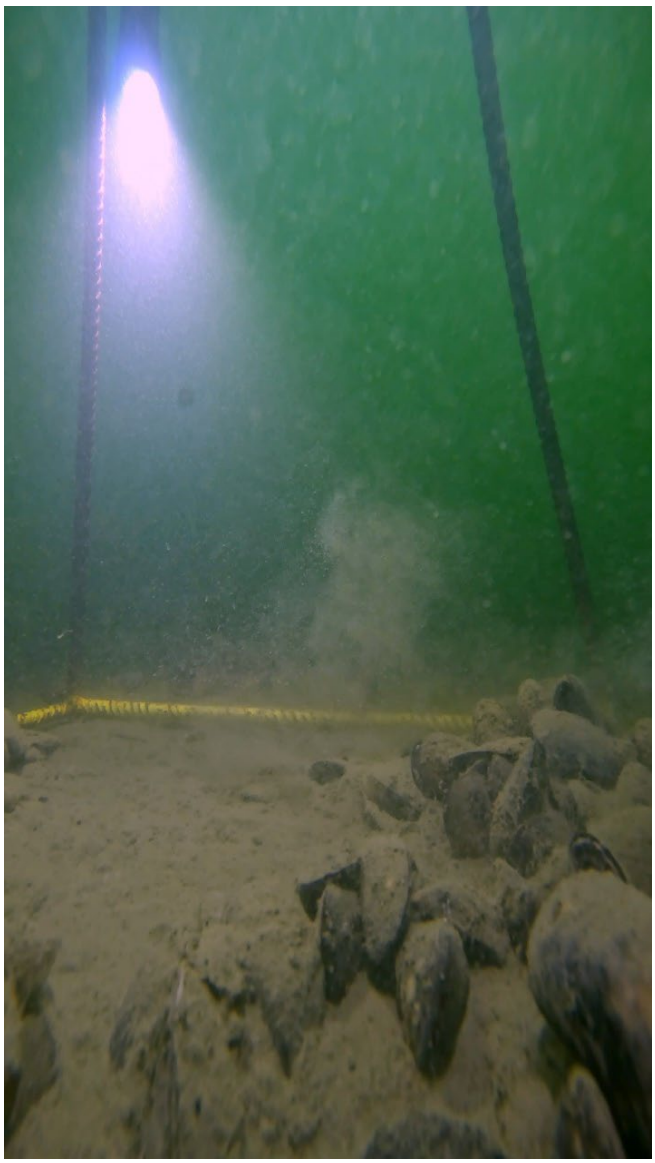
Survey Area:	***Little Mystic Channel***		Station:	***LM-7***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.379939*	Longitude (NAD83): *-71.049614*	Water Depth (FT): *-36.9*		

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:	***Little Mystic Channel***		Station:	***LM-8***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.379136*	Longitude (NAD83): *-71.048053*	Water Depth (FT): *-35.0*		

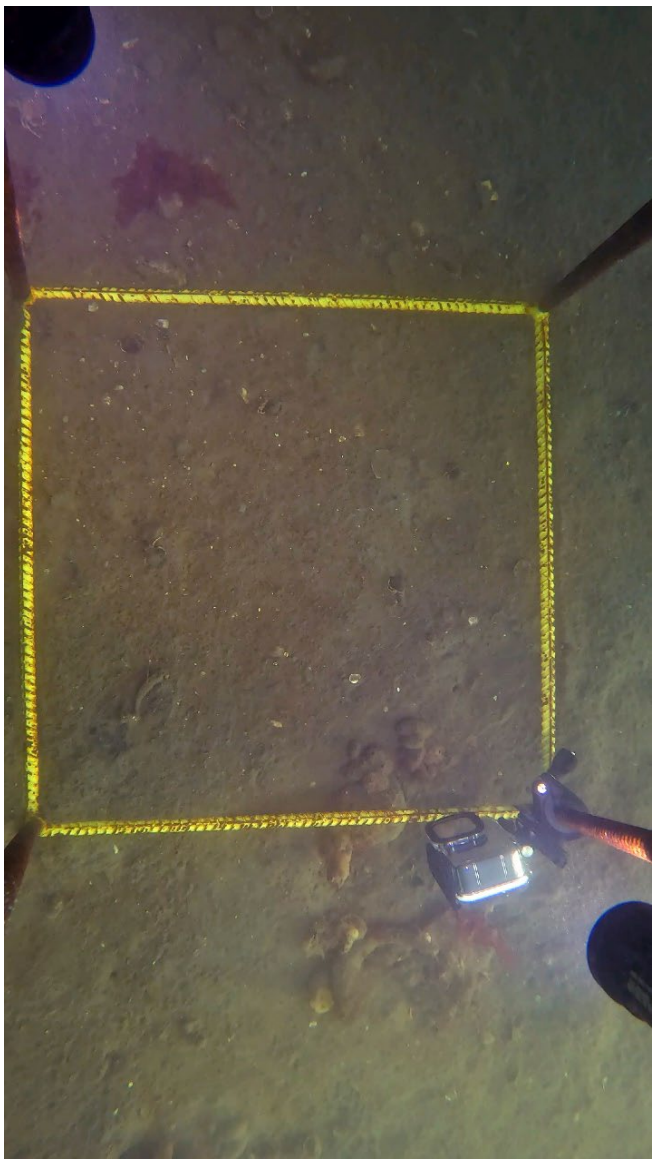
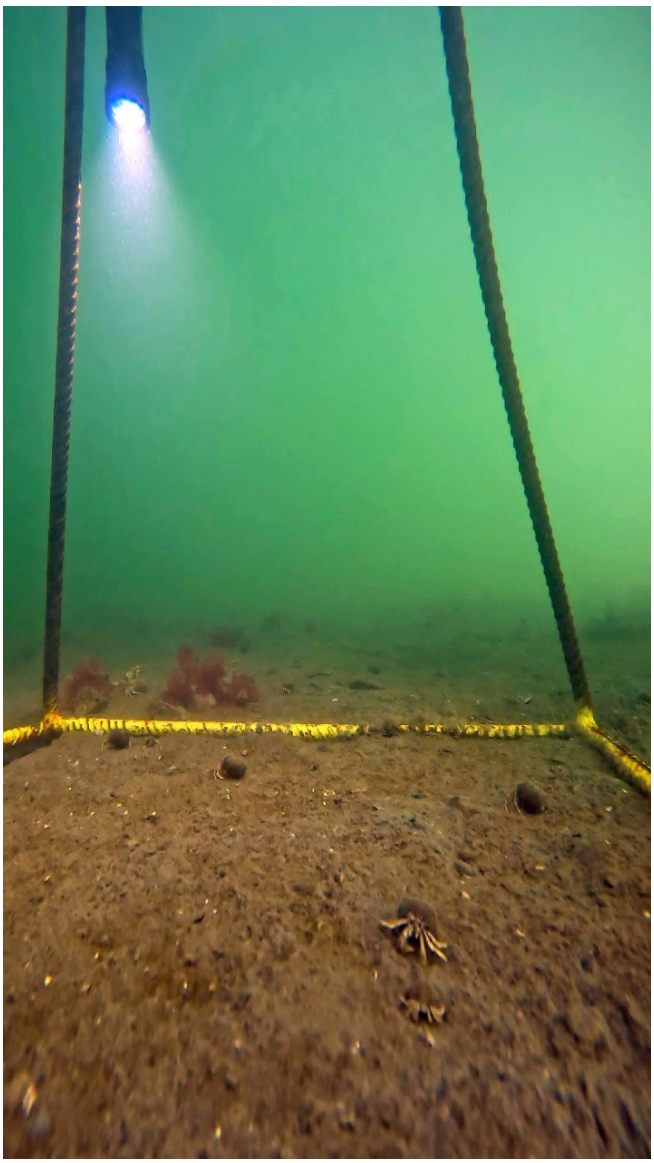
Plan View	Profile View
	

Notes:

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

BOSTON HARBOR - CHELSEA RIVER

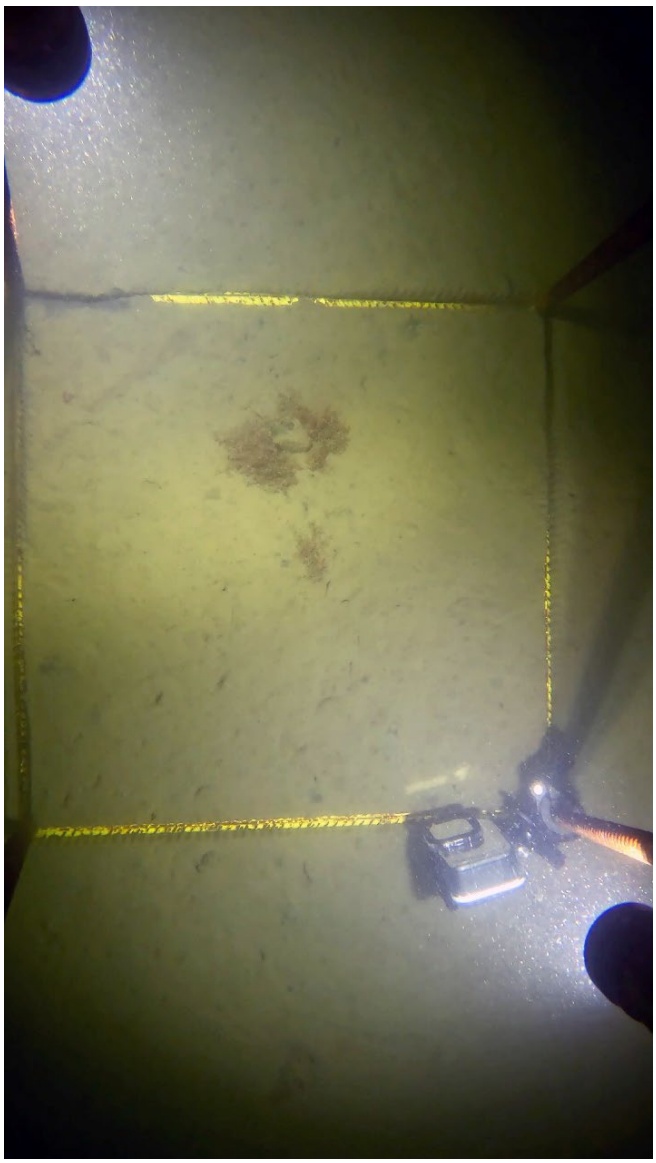
Survey Area:	***Chelsea River***		Station:	***CR-1***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.386501*	Longitude (NAD83): *-71.020414*	Water Depth (FT): *-5.3*		

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., Styaela clava, or Ascidiella aspersa) attached to hard substratum. Located near the East Boston shoreline, outside of the federal channel.

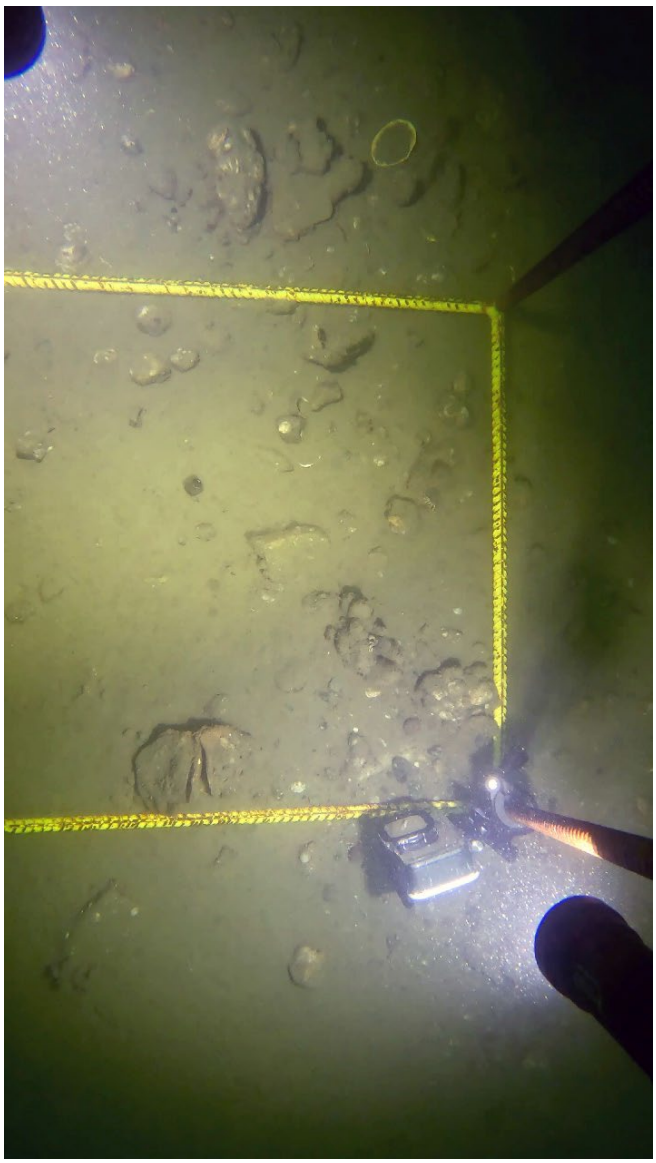
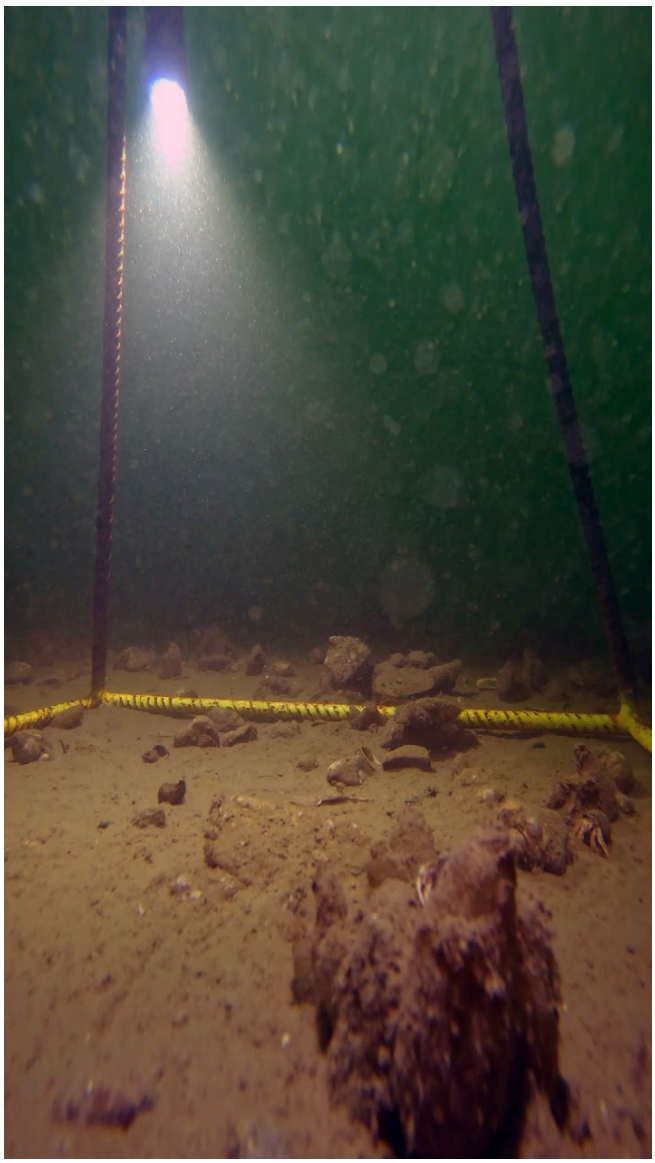
Survey Area:	***Chelsea River***		Station:	***CR-2***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.387856*	Longitude (NAD83): *-71.019612*	Water Depth (FT): *-54.4*		

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.

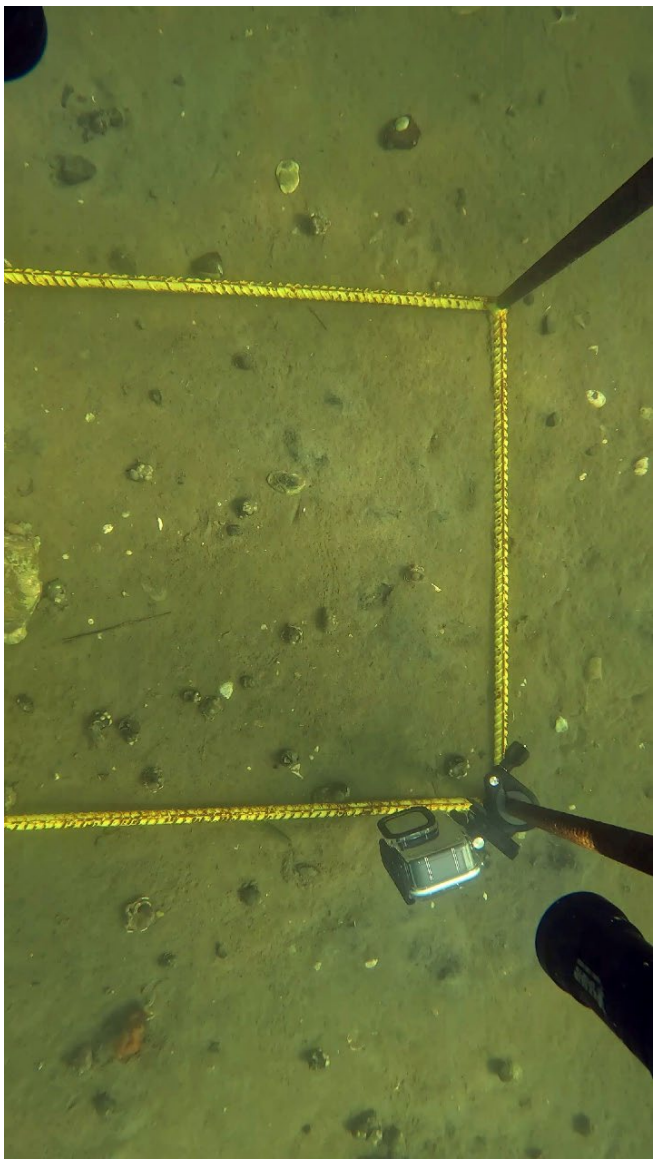
Survey Area:	***Chelsea River***		Station:	***CR-3***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.389127*	Longitude (NAD83): *-71.018698*	Water Depth (FT): *-43.0*		

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.

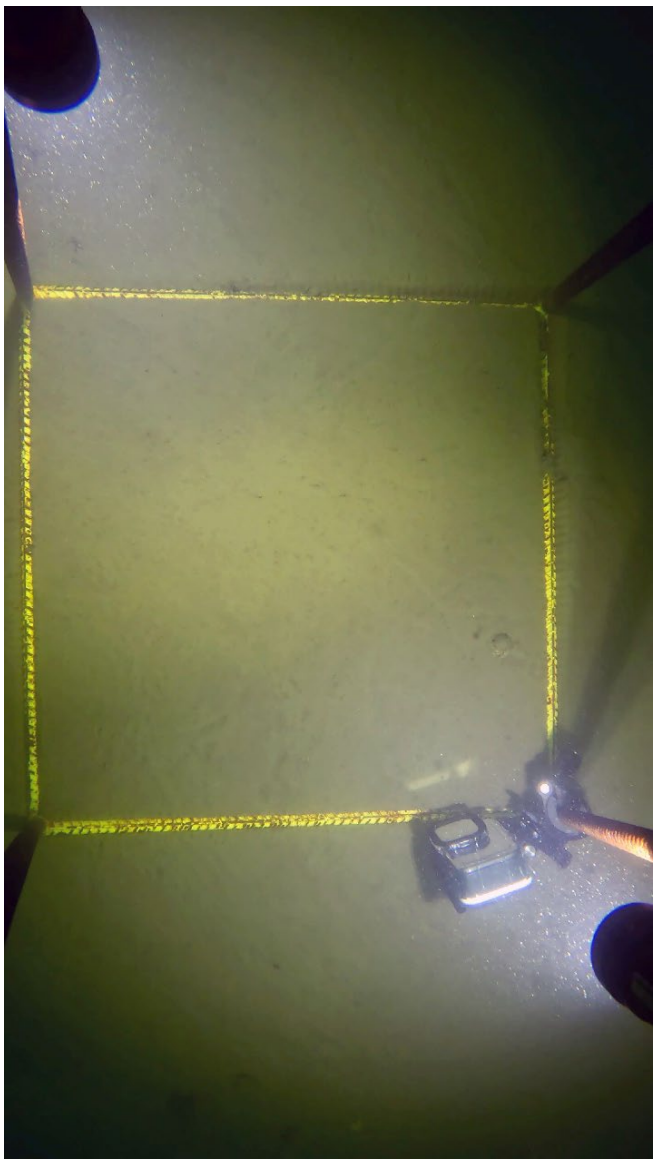
Survey Area:	***Chelsea River***		Station:	***CR-4***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.389461*	Longitude (NAD83): *-71.017508*	Water Depth (FT): *-3.8*		

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:	***Chelsea River***		Station:	***CR-5***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.391256*	Longitude (NAD83): *-71.016837*	Water Depth (FT): *-40.0*		

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.

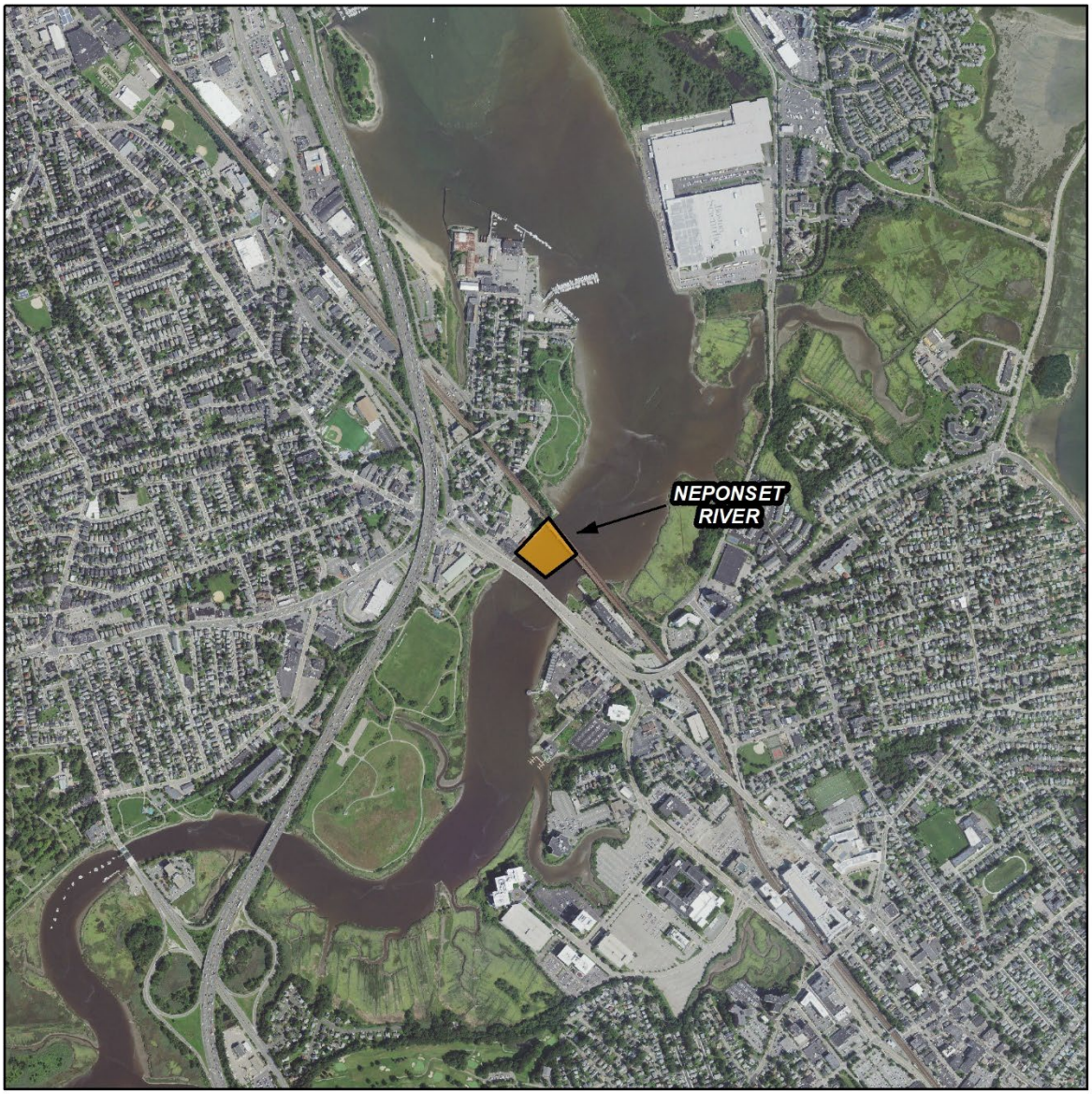
Survey Area:	***Chelsea River***		Station:	***CR-6***
Date: *10/24/2023*	Vessel: *R/V Nomad*	Platform: *0.25m^2 drop frame - plan and profile cameras*		
Latitude (NAD83): *42.392147*	Longitude (NAD83): *-71.015746*	Water Depth (FT): *-5.0*		

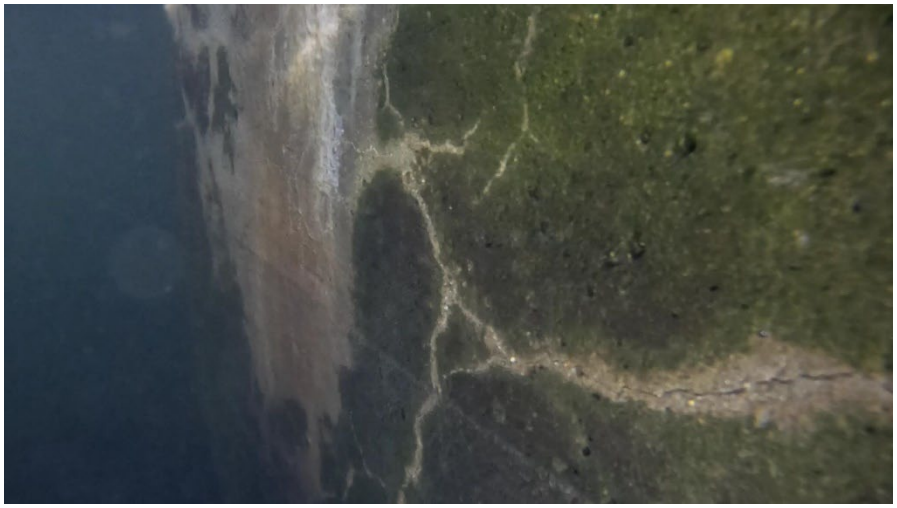
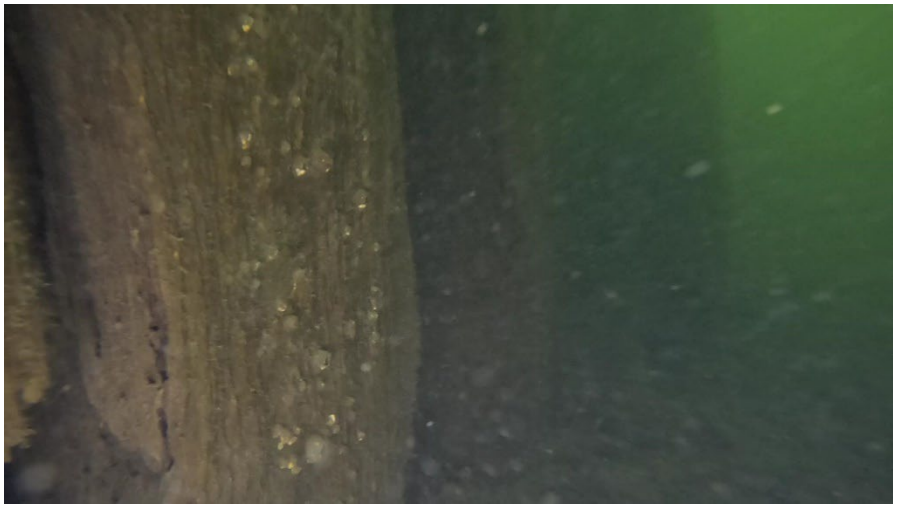
Plan View	Profile View

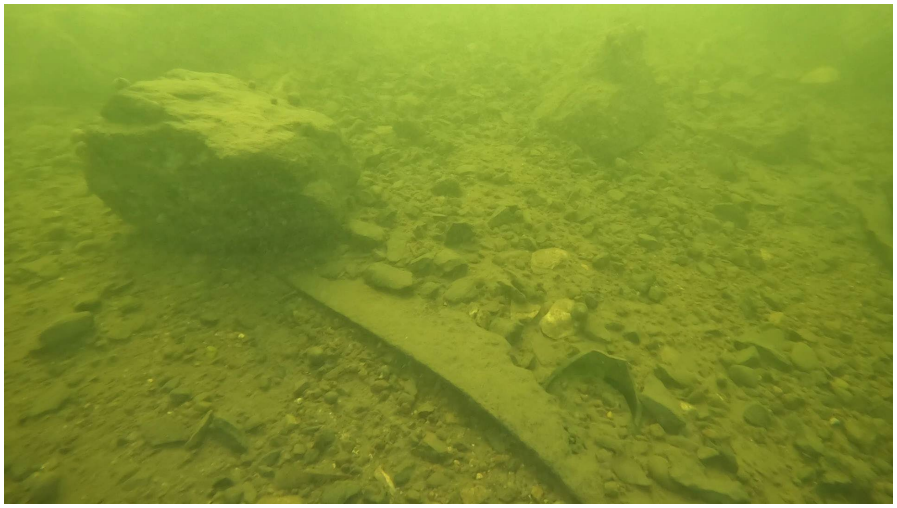
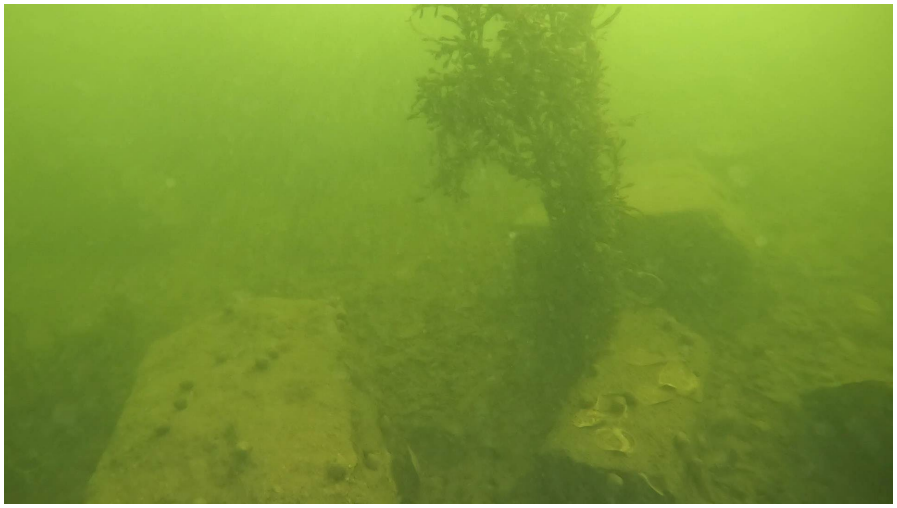
Notes:

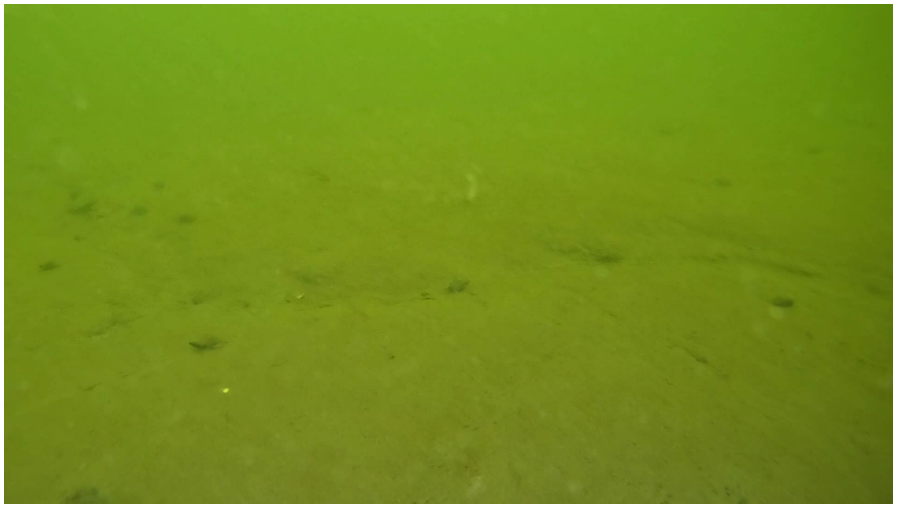
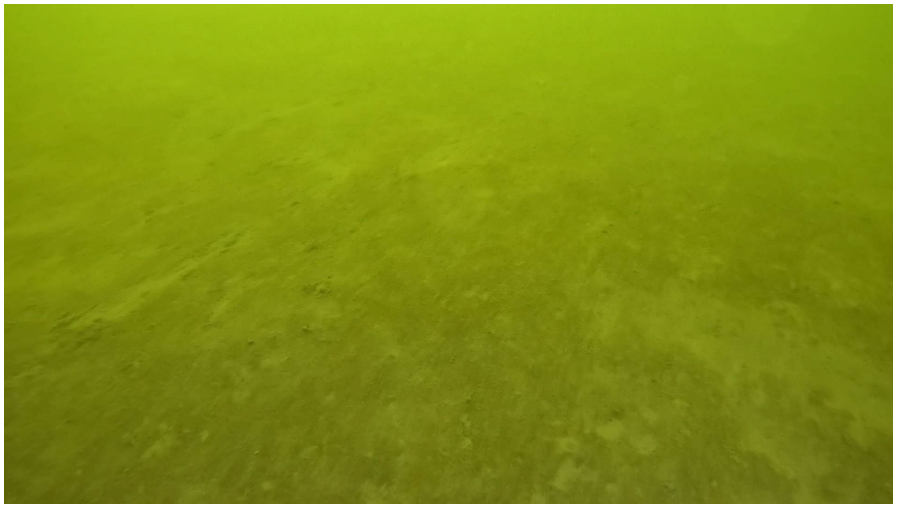
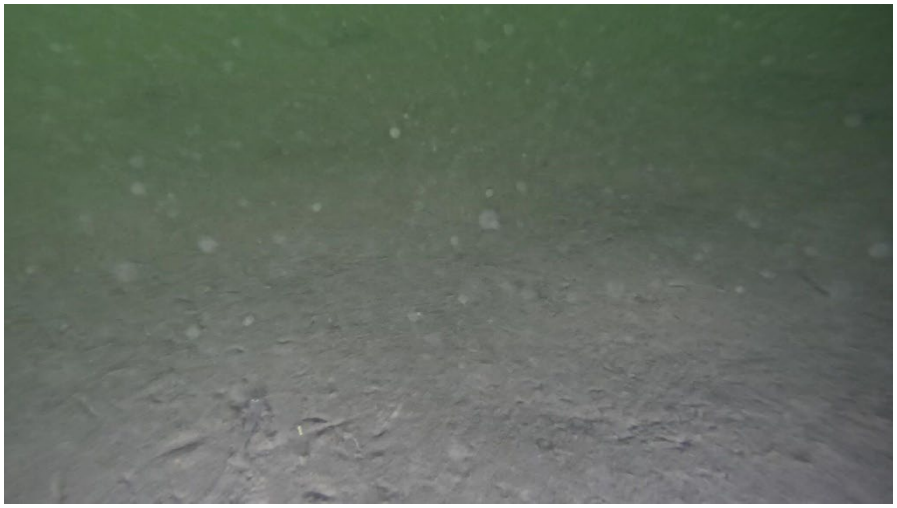
Gravel and shell debris with a moderate cover of barnacles (Balanidae spp.). Located near the East Boston shoreline, outside of the federal channel.

NEPONSET RIVER

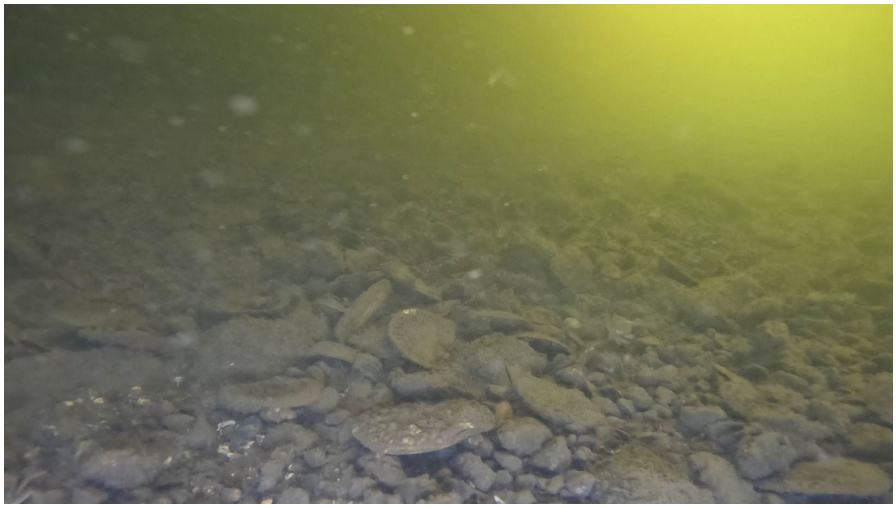


Survey Area:	***Neponset River – Western Shoreline Seawall***	Date: *10/26/2023*
Image		Description
		- *Typical condtions along concrete seawall*
		- *Derelict pilings forward of concrete seawall structure*
		- *Base of derelict pilings forward of concrete seawall structure* - *Algae, barnacles*

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

Survey Area:	***Neponset River – Subtidal Flat/ Channel Side Slope***	Date: *10/26/2023*
Image		Description
		- *Bare silt with hermit crabs (Paguridae 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:	***Neponset River – Bridge Piers and Adjacent Riverbed***	Date: *10/26/2023*

Image	Description
	- *Granite pier blocks in water column with algal growth, barnicles, 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*