



# Interim 2021 Memo Report: Seafloor Mapping and Field Sampling in Casco Bay, Maine

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For an overview of the Maine Coastal Mapping Initiative (MCMI) information products, including maps, data, imagery, and reports visit: <https://www.maine.gov/dmr/mcp/planning/mcmi/index.htm>.

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## **ABSTRACT**

During May-August 2021, the Maine Coastal Mapping Initiative (MCMI) conducted hydrographic surveying using a multibeam echosounder (MBES) in marine waters in the vicinity of Casco Bay, off Halfway Rock and Long Island, Maine, respectively. The surveying efforts were conducted to support efforts to enhance coastal resiliency through identification and characterization of seafloor habitat to provide information necessary to managing the marine environment and economy. The survey also coincides with state and federal efforts to update coastal data sets and increase high resolution bathymetric coverage for Maine's coastal and marine waters. This interim report provides a summary of data collected for the first half of the survey season, April 15 – August 16, 2021. A final report summarizing the entire coverage mapped during the 2021 season (April – November 2021) will be available in January 2022. During the first half of the season, 39.7 mi<sup>2</sup> (102.8 km<sup>2</sup>) of high-resolution multibeam data were collected in the vicinity of Casco Bay across both areas of interest. The MCMI also collected 69 sediment samples, water column data, and video in the vicinity of Casco Bay. Depths in the areas surveyed ranged from 3 to 30 meters off Long Island and 27 to 135 meters off Halfway Rock (mean lower low water). The morphology of the seafloor off Halfway Rock is characterized by a mix of gently sloping hard bottom and gravel covered ledges speckled throughout a plain of muddy flats in the southeast, with a system of larger ridges with semi-connected valleys trending roughly northeast to southwest in the northwest portion of the dataset. The region off Long Island is characterized mainly by a flat muddy bottom that slopes gently to rock of adjacent islands in the northern half of the dataset with a flat deposit of assumed sand in the south. This assumption has not yet been verified with ground-truthing efforts.

## 1.0 Area Surveyed

The survey area was located in and off Casco Bay in the Gulf of Maine, with a sub-locality off Halfway Rock and Long Island as shown in Figure 1. The approximately 37 mi<sup>2</sup> survey area off Halfway Rock adjoins the southwestern extent of the area mapped by MCFI in 2016 (NOAA survey registry number W00448) and the northeastern extent of the area mapped by MCFI in 2020 (currently being reviewed for acceptance by NOAA) (Figure 1). The approximately 2.65 mi<sup>2</sup> area off Long Island adjoins no recent survey efforts existing in the past twenty years but overlaps efforts conducted by NOAA in 2000 (NOAA survey registry number H10963). These data were not collected in direct accordance with the *NOS Hydrographic Surveys Specifications and Deliverables* and the *Field Procedures Manual* requirements; however, both documents were referenced during acquisition for guidance.

Survey limits are listed in Table 1.

Table 1 – 2021 survey limits

### Casco Bay Mainscheme – Off Halfway Rock

<b>Southeast Limit</b>	<b>Northwest Limit</b>
43° 33' 55.831" N	43° 35' 34.004" N
69° 49' 07.272" W	70° 00' 32.193" W

### Casco Bay Inshore – Off Long Island

<b>Southeast Limit</b>	<b>Northwest Limit</b>
43° 41' 09.541" N	43° 44' 09.544" N
70° 10' 05.370" W	70° 10' 11.050" W

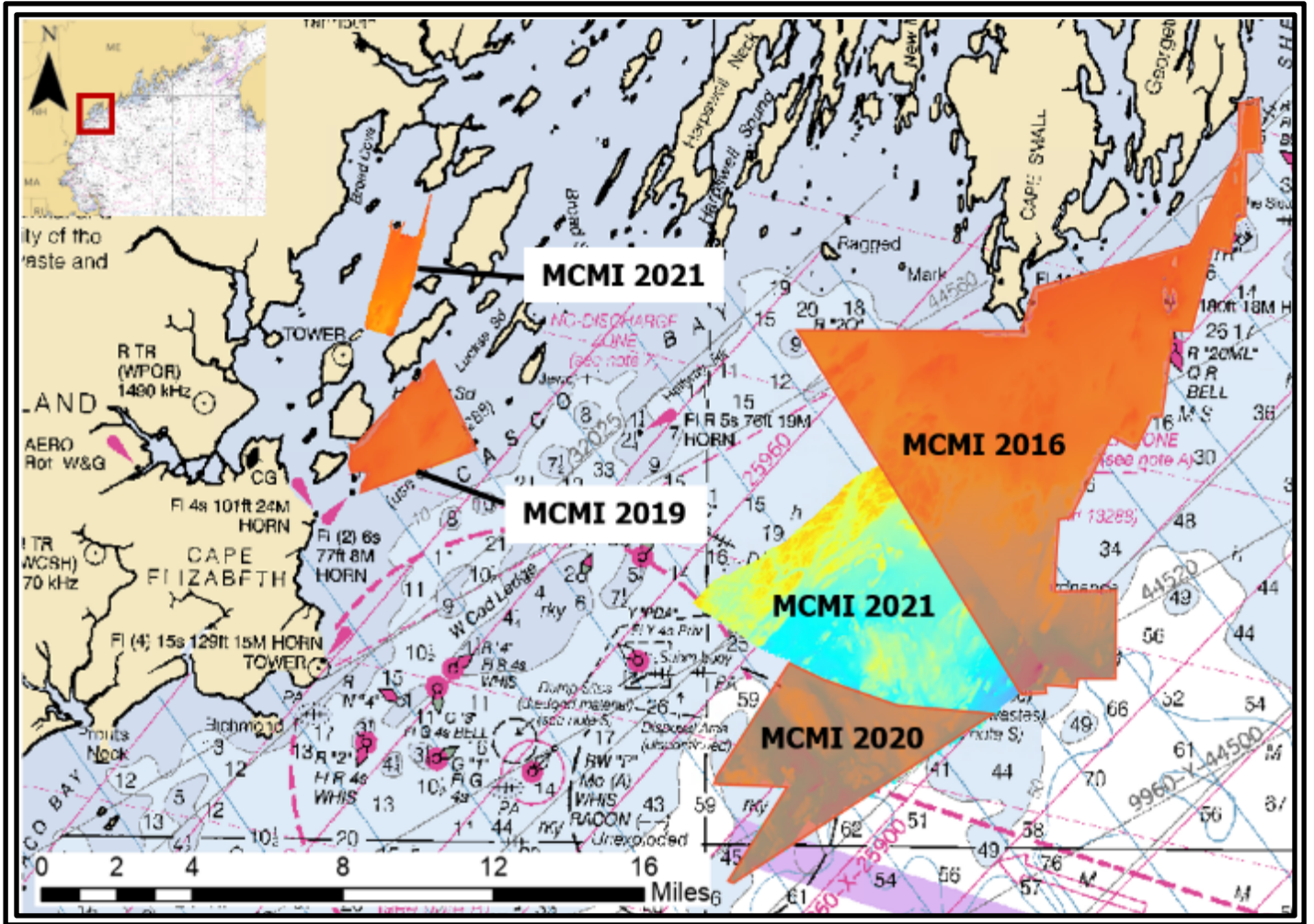


Figure 1 – General locality of 2021 MCMCI mainscheme and inshore survey coverage relative to available existing data in Casco Bay, Maine. Previous years' MCMCI survey boundaries are denoted with a red polygon and labelled accordingly.

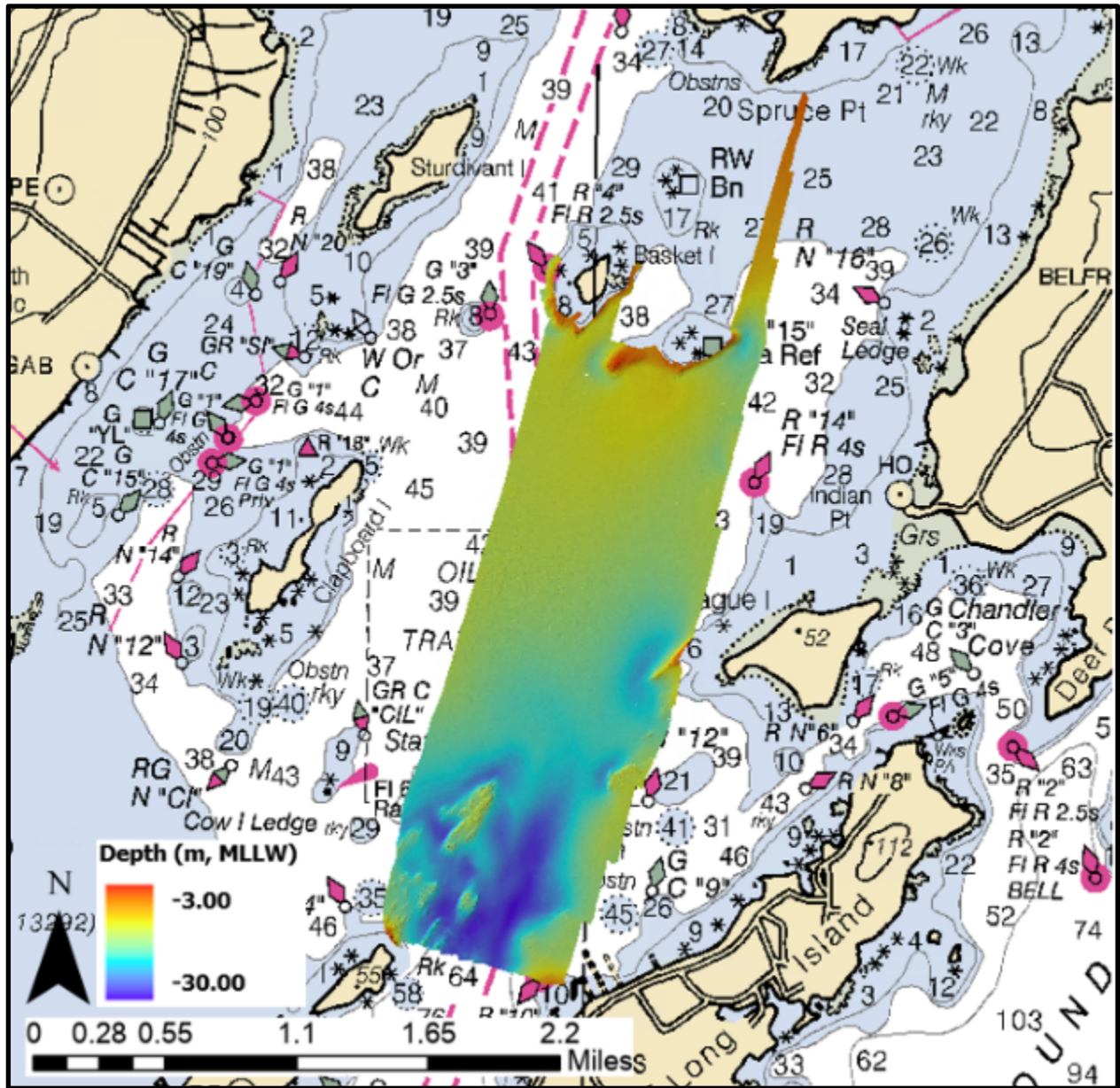


Figure 2 – Shaded relief image of 2021 inshore bathymetry data off Long Island gridded at 50-centimeter resolution and colored by depth. More MBES coverage in this area adjoining the northern, western, and southern extents is planned for the remainder of the 2021 season and the 2022 season.



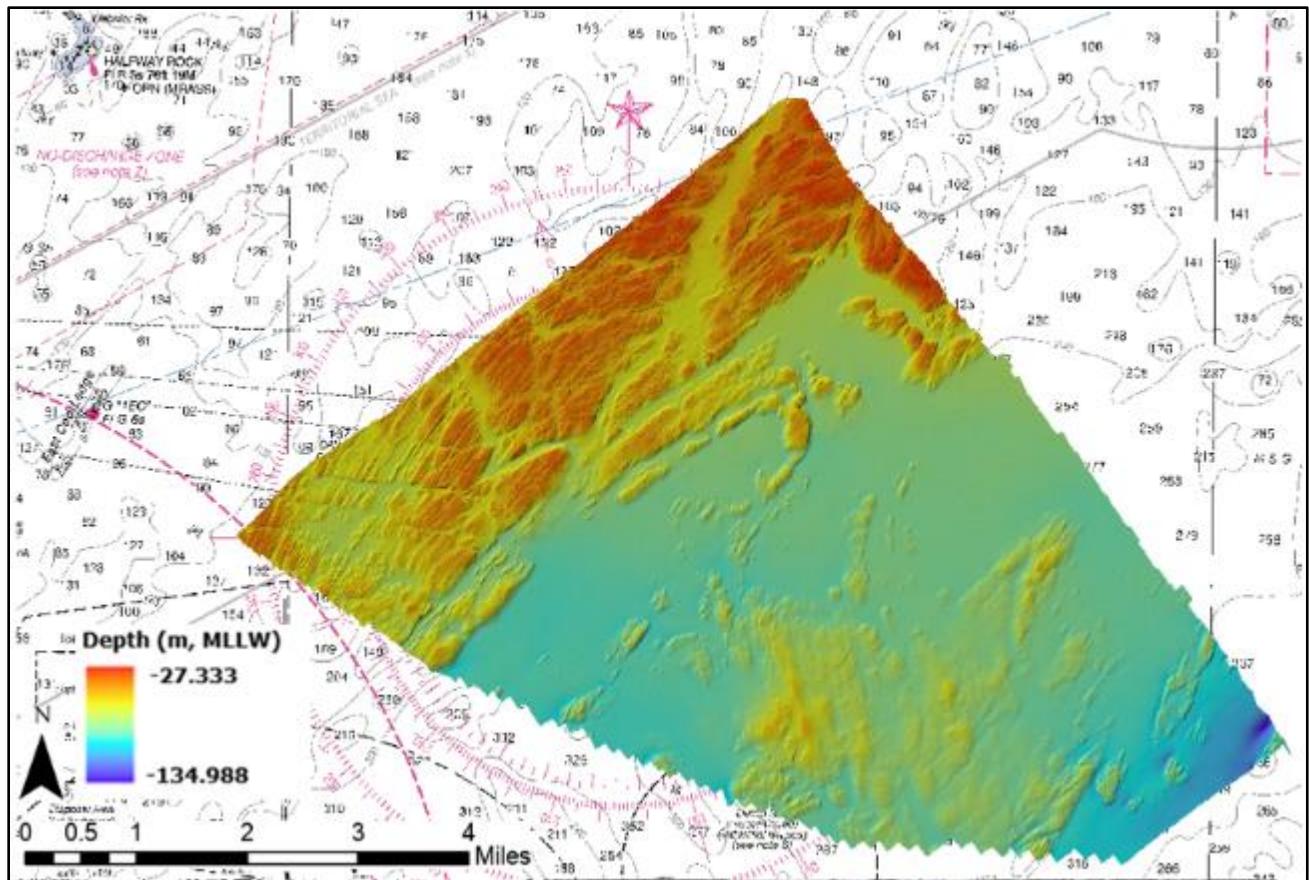


Figure 3 – Shaded relief image of 2021 mainscheme bathymetry data off Halfway Rock gridded at 4-meter resolution and colored by depth. More MBES coverage in this area adjoining the northwestern extent is planned for the remainder of the 2021 season and the 2022 season.

### 1.1 Survey Purpose

This survey was conducted by the Maine Coastal Program’s Maine Coastal Mapping Initiative (MCMCI) as part of a multi-agency cooperative agreement partially funded by the National Oceanic and Atmospheric Administration (NOAA) Office of Coastal Management, The Nature Conservancy (TNC), and the Maine Outdoor Heritage Fund. The purpose of this project is to help inform policy decision-making related to Maine’s coastal waters by increasing the volume of available high-quality bathymetric, benthic habitat, geochemical, and geologic data in the areas adjacent to Long Island and off Halfway Rock. This project also coincides with state and federal efforts to update coastal data sets for Maine’s coastal waters and provides new data in the areas covered by National Oceanic and Atmospheric Administration (NOAA) nautical charts 13260, 13288, and 13292 in Casco Bay. These data were acquired and processed to meet Office of Coast Survey bathymetry standards as best as possible and are shared with the NOAA Office of Coast Survey for review.

### 1.2 Survey Coverage

Numerous small holidays (gaps in MBES coverage) may exist within the surveyed area, and normally occurred as sonic shadows in areas of locally high relief and/or highly irregular bathymetry. Analyses of

bathymetric data show that the least depths were achieved over all features, and that holidays have not compromised data integrity.

## 2.0 Data Acquisition

The following sub-sections contain a summary of the systems, software, and general operations used for acquisition and preliminary processing during the 2021 survey seasons.

### 2.1 Survey Vessel

All data were collected aboard the Research Vessel (R/V) Amy Gale (length = 10.7 m, width = 3.81 m, draft = 0.93 m) (Figure 4), a former lobster boat converted to a survey vessel and contracted to the MCMI. The vessel was captained by Caleb Hodgdon of Hodgdon Vessel Services based out of Boothbay Harbor, Maine. The EM2040C transducer, motion reference unit (MRU), AML MicroX surface sound speed probe, and dual GNSS antennas were pole-mounted to the bow; pole raised (for transit) and lowered (for survey) via a pivot point at the edge of the bow. The main cabin of the vessel served as the data collection center and was outfitted with four display monitors for real time visualization of data during acquisition.



Figure 4 – R/V Amy Gale shown with pole-mounted dual GPS antennas, Kongsberg EM2040C multibeam sonar, MRU (not visible), and surface sound speed probe (not visible) in acquisition mode

### 2.2 Acquisition Systems

The real-time acquisition systems used aboard the R/V Amy Gale during the 2021 surveys are outlined in Table 2. Data acquisition was performed using the Quality Positioning Services (QPS) QINSy (Quality Integrated Navigation System; v.9.2.2) acquisition software. The modules within QINSy integrated all systems and were used for real-time navigation, survey line planning, data time tagging, data logging, and visualization.

Table 2 – Major systems used aboard R/V Amy Gale

Sub-system	Components
Multibeam Sonar	Kongsberg EM2040C and processing unit
Position, Attitude, and Heading Sensor	Seapath 330 processing unit, HMI unit, dual GPS/GLONASS antennas, MRU 5-V motion reference unit (subsea bottle), Fugro 3610 Receiver and AD-341 antenna
Acquisition Software and Workstation	QINSy software v. 9.2.2 and 64-bit Windows 10 PC console
Surface Sound Velocity (SV) Probe	AML Micro X with SV Xchange
Sound Velocity Profiler (SVP)	Teledyne Odom Digibar S sound speed profiler
Ground-truthing/Sediment Sampling Platform	Ponar grab sampler, GoPro Hero 3+ video camera, GoPro Hero 5 Black video camera, dive light, dive lasers, YSI Exo I sonde

## 3.0 Quality Control

### 3.1 Junctions

Junctions have not been calculated for collected datasets as the survey season remains to be completed. At the end of data collection, junction surfaces will be created and submitted with the data in these surveys.

### 3.2 Crosslines

Crosslines have not been conducted as of the writing of this report. Data collection for the 2021 survey season is still underway and crosslines will be completed at the end of the survey season.

## 4.0 Data Post-processing

The following is a summary of the procedures used for post-processing and analysis of survey data using Qimera (v.2.4.0, 64-bit edition) and Fledermaus (v.8.4.0, 64-bit edition) software.

### 4.1 Horizontal Datum

The horizontal datum for these data is WGS 84 projected in UTM zone 19N (meters).

### 4.2 Vertical Datum and Water Level Corrections

The vertical datum for these data is mean lower-low water (MLLW) level in meters. A tidal zoning file (.zdf; provided by NOAA CO-OPS) containing time and range corrections for verified data referenced from the Portland, ME (8418150) tide gauge was applied to all areas surveyed.

### 4.4 Final Surfaces

The following surfaces and BAGs were submitted with the survey data.

Table 3 – Surfaces produced from 2021 survey data

Surface Name	Resolution (m)	Depth Range (m)
AG_MCMI_21_02_25cm_MLLW	0.25	3 - 30
AG_MCMI_21_02_50cm_MLLW	0.5	3 - 30
AG_MCMI_21_01_2m_MLLW	2	27 - 135
AG_MCMI_21_01_4m_MLLW	4	27 - 135



## 4.5 Backscatter

Backscatter was logged in the raw .db files. The .db files also hold the navigation record and bottom detections for all lines of surveys. Processed sonar files containing multibeam backscatter data (snippets and beam-average) were exported from Qimera v.2.4.0 in .GSF format. QPS Fledermaus Geocoder Toolbox (FMGT; v.7.9.4, 64-bit edition) was used to import, process, and mosaic time-series backscatter data. Default backscatter processing settings were used to create the mosaic, except for the Angle Varied Gain (AVG) filter and AVG window size, which were set to ‘Adaptive’ and ‘100’, respectively. Backscatter mosaics of the data were gridded at 2-meter and 4-meter resolution for the Halfway Rock dataset and at 25-centimeter and 50-centimeter resolution for the Long Island dataset. Mosaics were exported in greyscale and floating-point GeoTIFF format. The mosaics are shown in Table 6 and Figures 5 and 6.

Table 4 – Backscatter mosaics produced from 2021 survey data

<b>Mosaic Name</b>	<b>Pixel Size (m)</b>
AG_MCMI_21_02_25cm_gs_backscatter.tiff	0.25
AG_MCMI_21_02_50cm_gs_backscatter.tiff	0.5
AG_MCMI_21_02_25cm_backscatter.tiff	0.25
AG_MCMI_21_02_50cm_backscatter.tiff	0.5
AG_MCMI_21_01_2m_gs_backscatter.tiff	2
AG_MCMI_21_01_4m_gs_backscatter.tiff	4
AG_MCMI_21_01_2m_backscatter.tiff	2
AG_MCMI_21_01_4m_backscatter.tiff	4

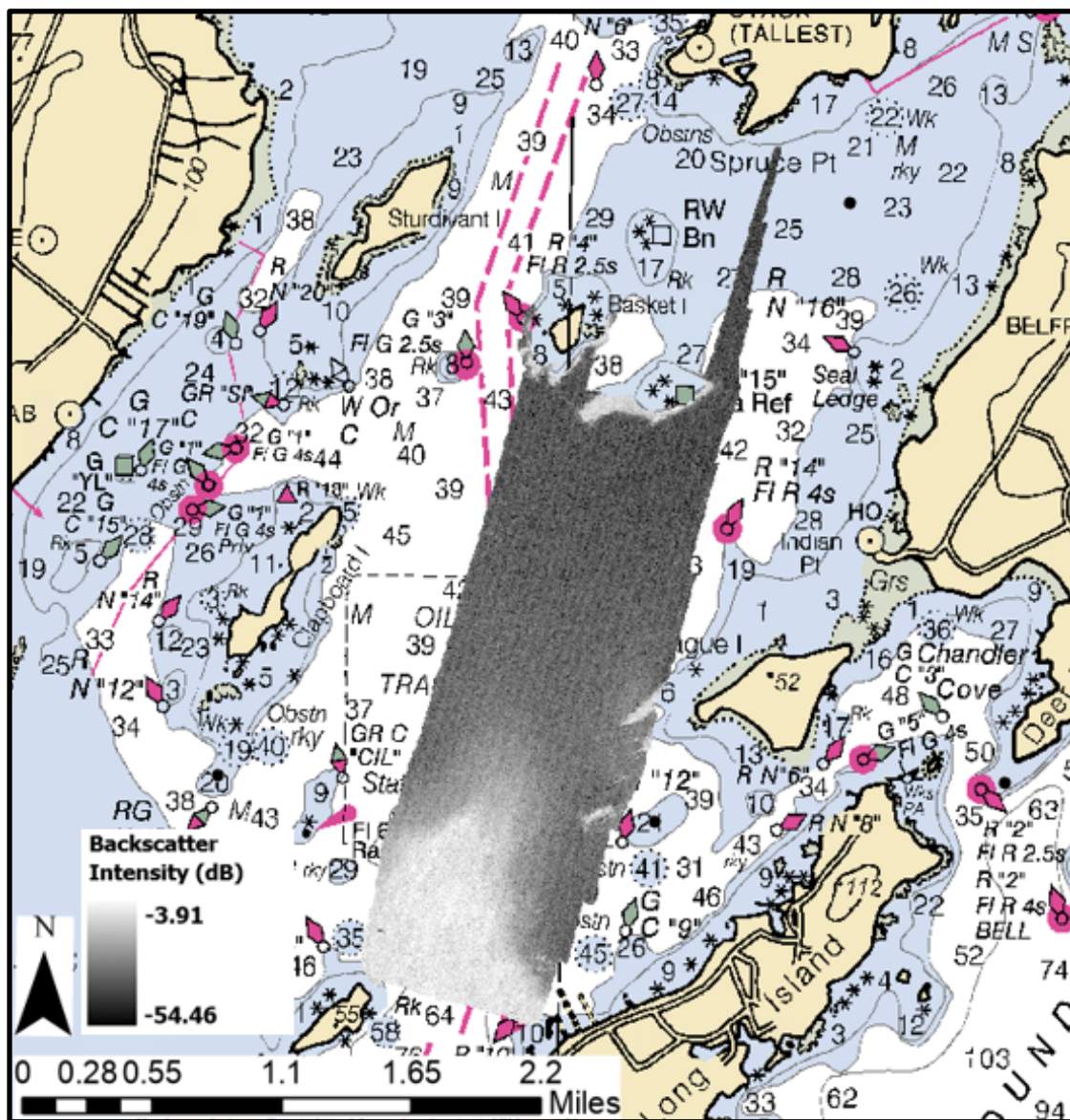


Figure 5 – Backscatter mosaic (50-centimeter pixel size) of 2021 survey off Long Island, in the vicinity of Casco Bay.

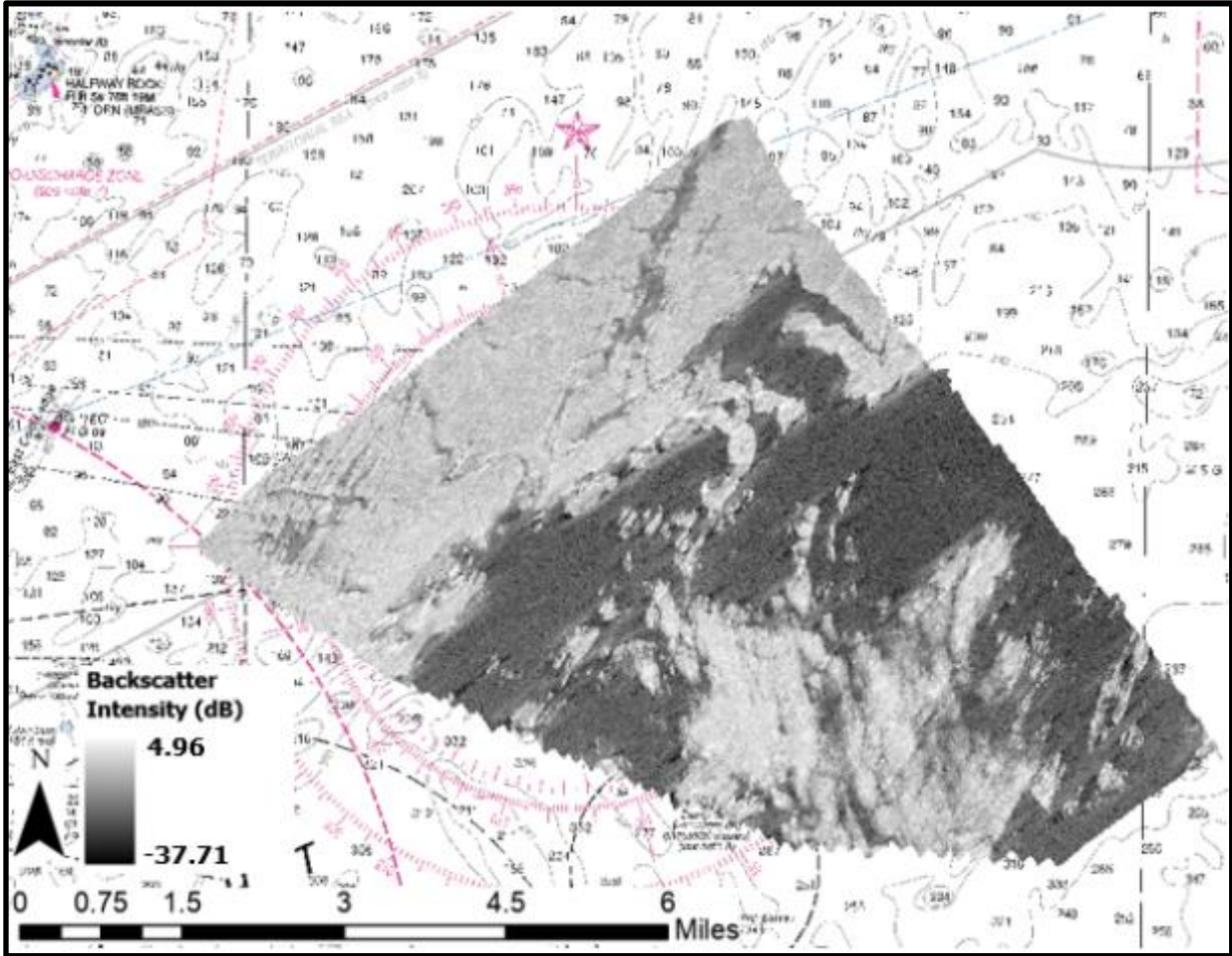


Figure 6 – Backscatter mosaic (4-meter pixel size) of 2021 survey off Halfway Rock, in the vicinity of Casco Bay.

## **5.0 Discussion**

### **5.1 Bottom Samples**

A total of 69 bottom samples were collected within area summarized in this report to supplement existing sediment data collected previously by other agencies (Maine Geological Survey and University of Maine) (Figure 7). These sample locations were chosen based on multiple criteria in order to create the best possible representation of seafloor substrate in the area. Criteria included diversified depth strata, expected surficial sediment type based on previous studies and backscatter returns. The results of grain-size and video analyses will be used to calibrate, refine, and digitize interpretations of seafloor substrate when mapping in the area is fully complete. These data will also be used to investigate benthic infauna distribution in the survey area.

### **5.2 Bathymetry and Characteristics of Seafloor**

Depths in the area off Halfway Rock ranged from 27 to 135 meters (approximately 85 to 443 feet; referenced to mean lower-low water). The morphology of the seafloor in this area is characterized by a mix of feature types. In the southeastern two-thirds of the dataset the region is characterized by muddy flats which are intermixed with gently sloping hard-bottom ledges, generally oriented in a northeast to southwest configuration. To the northwest of this region, the dataset is characterized predominantly by more dramatically rising hard-bottom, bedrock ledges, in some places covered by surficial gravel, which are split by semi-connected ravines composed of muddy gravel, trending generally in the same configuration of northeast to southwest.

Depths in the area off Long Island ranged from 3 to 30 meters (roughly 10 to 98 feet; referenced to mean lower-low water). The morphology of the seafloor in this area is characterized mainly by a muddy flat bottom which slopes gently upward toward hard-bottom outcroppings of adjacent islands. In the southwestern quarter of the dataset, there is as assumed flat sandy deposit interspersed with small hard-bottom ledges, but this region has not yet been ground-truthed for confirmation of backscatter returns.

Seafloor substrate type (e.g. mud, rock, sand, gravel) can be inferred by field observations of the collected bottom samples (Table 5). In general, the finest grain sediments (mud and muddy mixtures) were found at lower-lying depths (greater than 60 meters) and in-between hard-bottom features at shallower depths. However, complete analysis cannot be completed as the survey season has yet to complete grab sampling in regions of less than 30 meters in depth. Grain size descriptions are also based solely on field observations in this interim report. Complete grain size analysis for each sample will be completed following the completion of the 2021 survey season.

Hard bottom, presumably bedrock outcrops in some places surficially covered with cobble and gravel, were encountered in areas throughout the dataset and adjacent to charted features not yet surveyed in this survey season. Either small sediment samples (less than 3 centimeters in ponar depth) or no sediment samples were able to be recovered during sampling in areas such as these where the seafloor surface is completely consolidated. Small amounts can be collected in some cases due to bottom transport depositing a small surficial layer of sediment atop the hard substrate, but not enough to indicate a layer of said sediment. Video stills recorded by the underwater camera mounted to the grab sampling apparatus confirm the presence of hard and/or rocky substrate. Areas of intermediate depth, ranging from 30 to 60 meters displayed greater variation in sediment types retrieved from the bottom. Most samples in this depth range contained greater amounts of sand and gravel and more grab locations in this depth range were characterized predominantly

as sand or gravel versus mud. Furthermore, more samples were observed to contain shell hash compared to deeper grab locations. For the samples which were not primarily shell hash, coarse (pebble-sized) gravel was the most abundant.

Additional details on the bottom samples, including field photos and stills from collected video of the seafloor, are provided in Appendix B. More detailed analysis of grain size composition of these samples and benthic fauna composition will be determined after laboratory processing is complete for the collected samples (expected results and report May 2022).

## **6.0 Summary**

A total of 39.7 mi<sup>2</sup> (102.8 km<sup>2</sup>) of high-resolution multibeam data were collected in the survey areas off Halfway Rock and Long Island by MCMI from May to August of 2021 (37 mi<sup>2</sup> in the mainscheme off Halfway Rock and 2.65 mi<sup>2</sup> in the inshore region off Long Island). Except for multiple small holidays due to seafloor elevation-induced sonic shadows, multibeam coverage was 100% in all areas surveyed. Bathymetry and backscatter data were processed with 4-meter grid resolution and 50-centimeter grid resolution for Halfway Rock and Long Island datasets, respectively, although 2-meter and 25-centimeter surfaces were produced for the respective surfaces in submission of this report. The bathymetry and backscatter information for the Halfway Rock region are supplemented by seafloor surficial sediment samples, water column data, video, and benthic fauna collection in 69 locations.

No surficial sediment samples or benthic fauna collection has been conducted in the Long Island region as of the writing of this interim report. Continued sampling in this region is planned for the remainder of the season. Furthermore, continued collection of bathymetric and backscatter data is planned for both areas for the remainder of the 2021 season and into the 2022 season as necessary.

These data were acquired and processed to meet Office of Coast Survey bathymetry standards as best as possible and were shared with NOAA OCS for review for expected revision of nautical charts.

Please contact the Maine Coastal Mapping Initiative for additional information or data request.

## **References**

NOAA, 2021. NOS hydrographic surveys specifications and deliverables: U.S Department of Commerce National Oceanic and Atmospheric Administration. 162 pages.

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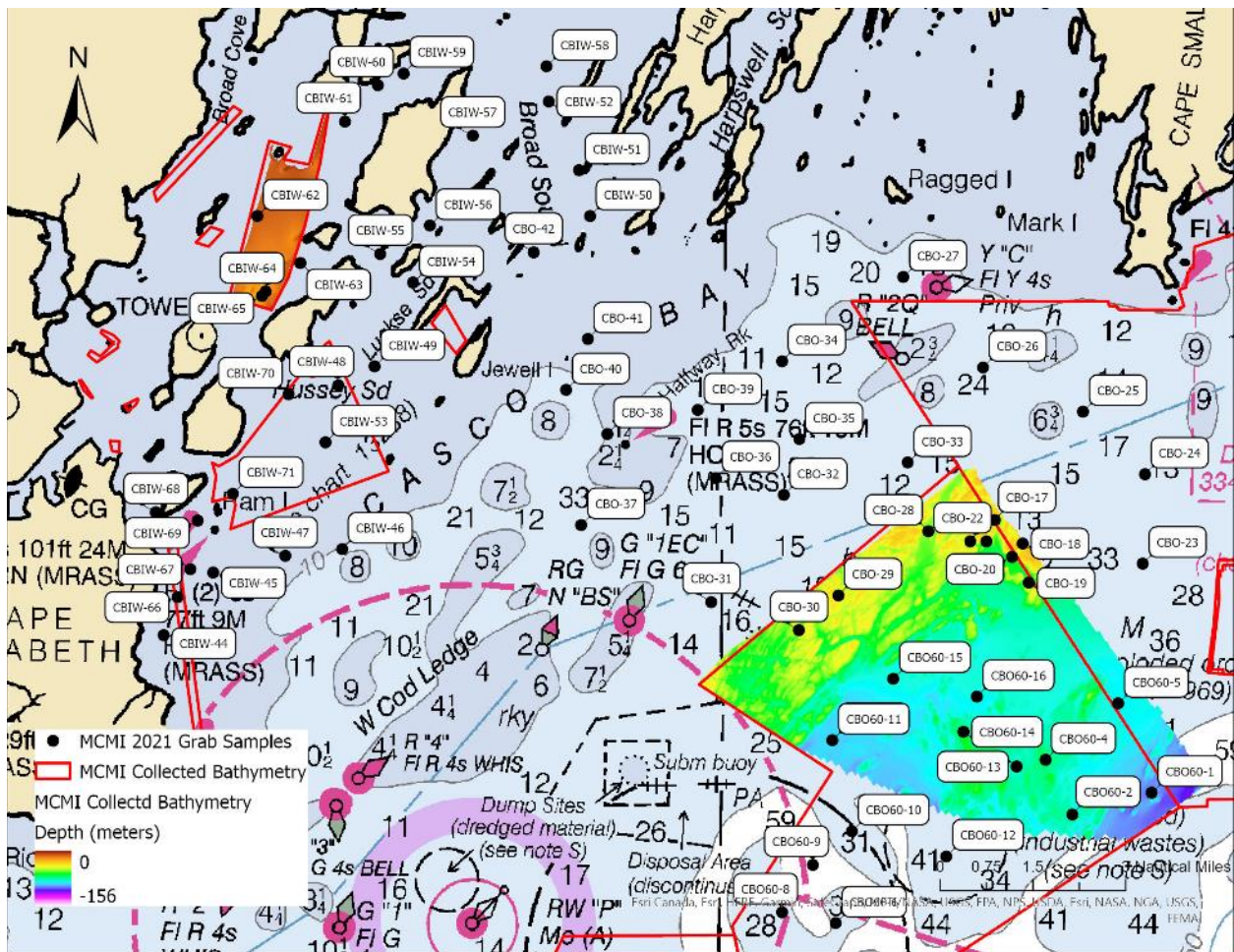


Figure 7 – Bottom sample locations and multibeam echosounder collected bathymetry for the 2021 survey areas.

Table 5 – Grab Sample Information


Site Name	Collection Date	Collection Time (EDT)	Latitude (DD)	Longitude (DD)	Depth (m)	Bottom Salinity	Bottom Temp (C)	Bottom pH	Bottom DO mg L <sup>-1</sup>	Bottom CHL µg L <sup>-1</sup>	Grain size (field observation)	Grain color (field observation)	Infauna collection notes	Video Notes
CBO60-1	7/14/21	8:13	43.564349	-69.840433	86.7	-	7.68	7.80	7.81	0.05	rock	N/A	Urticina, sponge - Haliclona	Rock with veneer of fine sediment; Urticina, sponge, veneer of fine sediment on rock
CBO60-2	7/14/21	8:33	43.558195	-69.869769	80.0	-	7.89	7.81	7.84	0.18	gravelly muddy sand	2.5Y 4/2	worm tubes, bivalves, worms, Astarte, Praxillella, brittle star	No video recorded
CBO60-4	7/14/21	9:45	43.572898	-69.880058	66.2	-	8.10	7.83	7.89	0.10	muddy gravel	2.5Y 3/2	Astarte, Ophelina, sea squirts, amphipods	Mud and gravel; Cerianthus, some shell
CBO60-5	7/14/21	10:14	43.588254	-69.853241	89.3	-	7.88	7.82	7.84	0.09	mud with shell hash	5Y 3/2	worm tubes, worms, bivalve, Nereus	Mud bottom; considerable snow, worm holes
CBO60-6	7/27/21	7:13	43.528288	-69.957010	83.1	-	-	-	-	-	rock	N/A	sea squirts	Rock covered with fine sediments; hydroids, Cerianthus seen on retrieval
CBO60-7	7/27/21	7:32	43.518502	-69.940640	103.0	-	-	-	-	-	silty mud with trace sand	10Y 3/2	small polychaetes, worm tubes, bivalves, hydroid, brittle stars, worms, shimmy worms	Mud bottom; mysids, Cancer crab
CBO60-8	7/27/21	8:19	43.531016	-69.977044	89.2	-	-	-	-	-	clayey sandy mud with trace sand and gravel	2.5Y 3/2	bivalves, tube worms, worm tubes, amphipods, shimmy worms, comman shrimp	Mud bottom; several hake, amphipod tubes, depressions
CBO60-9	7/27/21	9:24	43.543871	-69.965711	105.0	-	-	-	-	-	silty mud with trace sand	5Y 3/2	worm tubes, snot worms, bivalves, shimmy worms, worms, Astarte, Y. sapotilla	Mud bottom; amphipod tubes, some depressions
CBO60-10	7/27/21	10:19	43.553137	-69.951391	69.8	-	-	-	-	-	sandy gravel with mud, assumed atop rock due to low yield	2.5Y 4/2	baby barnacles, Astartes, sea squirts, amphipods, worm tubes, brittle star, shimmy worm	Mud bottom with some shell; hydroids, Cerianthus, amphipod tubes
CBO60-11	7/27/21	10:45	43.577565	-69.959073	93.6	-	-	-	-	-	silty mud with trace sand	2.5Y 3/2	wrymouth ~25cm, snot worm, bivalves, sea squirt, brittle star	Mud bottom; few depressions
CBO60-12	8/4/21	7:22	43.546660	-69.916299	95.8	-	8.26	7.77	6.73	0.24	silty mud with trace sand	5Y 3/2	bivalves, worms, worm tubes, Nephys, nemerteans, shrimp, Cirratulids, Spionids	Mud bottom, several depressions, amphipod tubes, hake
CBO60-13	8/4/21	8:54	43.571006	-69.890589	85.7	-	8.88	7.82	7.00	0.26	clayey silty mud with trace sand	5Y 3/2	Nephys, bivalves, Cirratulids, Astartes, Ampharetid, Scalibregmid	Mud bottom, several depressions, amphipod tubes, mysids, hake
CBO60-14	8/4/21	10:10	43.580183	-69.910541	70.2	-	8.88	7.84	7.10	0.36	rock	N/A	N/A	Mud bottom, anemone, worm holes, hake
CBO60-15	8/4/21	11:46	43.594332	-69.936722	88.3	-	8.31	7.80	6.68	0.49	clayey mud with trace sand	5Y 3/2	worms, bivalves, big worm, Lumbrinerius, brittle star	Mud bottom, amphipod tubes
CBO60-16	8/4/21	10:28	43.589701	-69.905621	89.6	-	8.51	7.81	6.91	0.19	clayey silty mud with trace sand	5Y 3/2	worm tubes, bivalves, brittle star, nemerteans, snail	Mud bottom, amphipod tubes, holes, mysids
CBO-17	8/10/21	7:20	43.637261	-69.899735	39.0	-	10.43	7.81	7.09	0.46	rock	N/A	N/A	Rock bottom with veneer of fines, hydroids, barnacles, cunner on retrieval
CBO-18	8/10/21	7:34	43.631044	-69.889253	45.4	-	10.52	7.84	7.26	0.42	sand with shell hash and trace gravel	5Y 2.5/2	worms, worm tubes, amphipods, bivalve, bryozoa	Sand bottom, hydroids, some shell, rock on retrieval
CBO-19	8/10/21	8:40	43.620496	-69.886797	42.0	-	10.73	7.87	7.68	0.55	rock	N/A	N/A	Rock bottom, sea star, hydroids, sponge, barnacles, cunner, sponge
CBO-20	8/10/21	8:54	43.627431	-69.893151	60.0	-	9.57	7.82	7.00	0.36	clayey muddy sand	2.5 Y 3/3	worms, bivalves, worm tubes, Cirratulids, Y. sapotilla, shimmy worm, brittle star	Mud bottom, shell, worm holes
CBO-21	8/10/21	10:32	43.631602	-69.902709	48.0	-	9.95	7.87	7.26	0.55	rock	N/A	N/A	Rock bottom with veneer of fines, sponge, hydroids
CBO-22	8/10/21	10:47	43.631443	-69.908863	38.0	-	9.98	7.85	7.29	0.35	surficial gravel atop rock	N/A	gravel collected did not yield enough for infauna sample	Rock on shellhash & gravel, hydroids, sponge, Cancer crab, cunner, barnacles, Urticina, Retrieval shows boulder field
CBO-23	9/1/21	7:29	43.626016	-69.844616	52.7	-	10.32	7.81	6.72	0.58	rock	N/A	N/A	Rock rubble with veneer of sediment, redfish, sponge, seastar
CBO-24	9/1/21	7:48	43.650070	-69.844236	37.2	-	10.95	7.84	6.99	0.84	sand	10YR 3/3	Arctica icelandica (~80mm), worm tubes, worms, sand dollar pieces, amphipods, bivalve, barnacle pieces, brittle star	Sand bottom, shell
CBO-25	9/1/21	8:41	43.666731	-69.867372	31.7	-	11.55	7.83	6.72	0.65	gravelly sand with shell hash	10YR 3/2	sand dollars, worms, isopods	Sand bottom with gravel, shell, sculpin
CBO-26	9/1/21	9:26	43.678381	-69.904774	42.3	-	11.04	7.82	6.58	1.05	silty clayey mud	5Y 3/2	amphipods (2 species), worms, worm tubes, bivalves, nemertean	Mud bottom, considerable silt suspended, depression
CBO-27	9/1/21	10:56	43.702442	-69.934722	36.3	-	11.84	7.79	6.13	0.65	clayey mud	5Y 2.5/2	amphipods, worm tubes, worms, bivalves, shimmy worm, brittle stars	Mud bottom, considerable silt suspended, lobster
CBO-28	9/14/21	7:48	43.634098	-69.924302	60.9	-	10.29	7.74	6.20	0.58	clayey mud with trace sand and gravel	2.5Y 3/2	worms, clams/bivalves, worm tubes, amphipods, sea squirt, large snot worm, snot worms, shimmy worm	Bottom obscured; no observations possible.
CBO-29	9/14/21	9:06	43.616587	-69.957509	40.4	-	11.09	7.79	6.67	0.26	rock	N/A	N/A	Bedrock with veneer of sediment, sea star, barnacles, sponge, hydroids
CBO-30	9/14/21	9:28	43.607036	-69.971878	52.6	-	10.95	7.79	6.66	0.29	gravelly sandy mud with shell hash	5Y 3/3	bivalves, worms, shimmy worms	Bottom obscured; no observations possible except rock seen on retrieval of second drop with cunner, red fish, anemones, sponge
CBO-31	9/14/21	20:33	43.614366	-70.004494	43.7	-	10.80	7.79	6.47	0.36	rock	N/A	N/A	Boulder field with veneer of sediment; sponge, sea star, barnacles

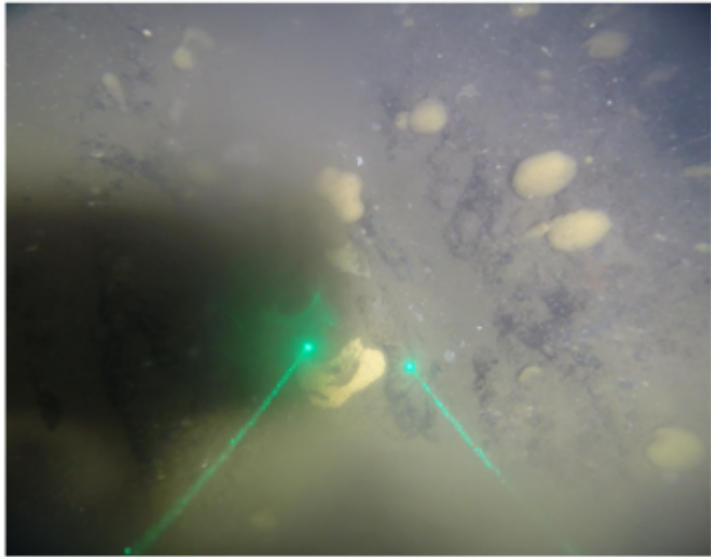

Site Name	Collection Date	Collection Time (EDT)	Latitude (DD)	Longitude (DD)	Depth (m)	Bottom Salinity	Bottom Temp (C)	Bottom pH	Bottom DO mg L <sup>-1</sup>	Bottom CHL µg L <sup>-1</sup>	Grain size (field observation)	Grain color (field observation)	Infauna collection notes	Video Notes
CBO-32	9/14/21	11:06	43.643375	-69.978241	41	-	11.35	7.81	6.78	0.29	muddy gravel with shell hash	10Y 3/2	brittle stars, snail, worm tubes, encrusting bryozoans, bivalves with Astartes, amphipods, sea squirts	Rock pile and gravel on shellhash; Urticina, small unIDd fish, cunner, sponge
CBO-33	9/14/21	12:13	43.652464	-69.932271	41.9	-	11.58	7.80	6.49	0.30	surficial mud and shell hash atop rock	N/A	N/A	Drops 1 and 2: Muddy bottom with shells and shell hash, both drops show the mud burrowing anemone Cerianthus; Drop 3 shows rock pile with shells and shellhash, sponge; cunner
CBO-34	9/21/21	8:18	43.679412	-69.979406	49.8	-	11.73	7.74	5.64	0.64	clayey mud with trace fine sand	2.5Y 3/2	Ribbon worm, Nephtys, worm tubes, bivalves, Maldanids, Cirratulids, cumacean	Bottom obscured; no observations possible.
CBO-35	9/21/21	9:15	43.658441	-69.972640	55.6	-	11.73	7.80	6.10	0.63	clayey mud with trace fine sand	5Y 3/2	snout worm, Lumbrinerius, Y. sapotilla, bivalves, amphipods, cirratulids, shimmy worm	Mud bottom; lobster seen on impact, few depressions
CBO-36	9/21/21	10:11	43.647776	-70.003411	55.1	-	11.89	7.82	6.28	0.39	clayey mud with trace coarse grain sand and gravel	5Y 2.5/2	stirnapes, bivalves, worm tubes, shimmy worms, amphipods, worm tubes, snout worm	Mud bottom; no other features seen
CBO-37	9/21/21	11:02	43.634669	-70.053122	42.3	-	12.73	7.87	6.58	0.76	muddy gravel with coarse sand	5Y 3/2	astartes, cardium, barnacles, amphipods, worms, mysids, worm tubes, brittle star, sea squirt, anomia, bivalves, bryozoans	Gravelly mud bottom with stones and shell; sculpin, swimming amphipods
CBO-38	9/21/21	11:36	43.659301	-70.043873	39.3	-	12.96	7.86	6.46	0.82	surficial shell hash atop rock	N/A	large mussel, shimmy worm, algae, bryozoan, astarte, sponge on algae	Shellhash with gravel; drift algae; cunner; flounder
CBO-39	9/21/21	12:18	43.665971	-70.010331	52.2	-	12.56	7.85	6.41	0.65	gravelly muddy sand with shell hash	5Y 3/2	amphipods, worms, worm tubes, astartes	Mud bottom with shells and some gravel; lobster
CBO-40	10/7/2021	7:03	43.670934	-70.059457	35.7	-	13.51	7.74	6.05	0.59	rock	N/A	N/A	Rock bottom with shellhash; sponge, arrow worms; sponge, anemone, hydroids
CBO-41	10/7/2021	7:17	43.684718	-70.051669	60.3	-	13.50	7.76	6.00	0.38	muddy gravel	5Y 3/1	hydroids, worm tubes, bivalve, worm	Mud-Gravel bottom; drift algae, swimming amphipods
CBO-42	10/7/2021	8:04	43.707942	-70.072079	39.5	-	14.94	7.89	6.98	3.33	muddy gravel	5Y 2.5/1	bryozoan, limpet, barnacles, bivalves, anomia, nemertine	Mud with much gravel and some shell; Cancer crab, barnacles, drift eelgrass; sculpin, lobster
CBIW-44	10/13/2021	10:17	43.603460	-70.207592	17.4	-	15.38	7.91	7.45	2.89	gravelly sand	5Y 2.5/2	worms, amphipods (at least 3 species), bryozoan, nephtys, snails, amphipods	Gravel-mud-shell bottom; swimming amphipods
CBIW-45	10/13/2021	10:03	43.620469	-70.18952	18.8	-	15.37	7.93	7.68	3.45	rock	N/A	N/A	Rock pile, gravel and shellhash in interstices; Anomia, barnacles
CBIW-46	10/13/2021	9:33	43.627253	-70.141778	21.8	-	14.77	7.92	7.49	1.36	rock	N/A	N/A	Bedrock bottom; sponge, hydroids; rose fish, sea star
CBIW-47	10/13/2021	9:49	43.625266	-70.162846	25.7	-	14.76	7.90	7.34	1.25	rock	N/A	N/A	Rock Bottom; Henricia, cunner, swimming amphipods, sponge, hydroids
CBIW-48	10/13/2021	8:19	43.67142	-70.144092	19.8	-	15.13	7.92	7.51	2.40	muddy gravel composed primarily of shell hash-pebble mix	5Y 3/2	worms, worm tubes, astartes, rock crab, snails	Shellhash-gravel bottom with rock; cunner
CBIW-49	10/13/2021	6:57	43.676552	-70.130639	30.8	-	14.82	7.88	7.52	2.70	clayey mud with trace sand	2.5Y 3/2	worms, worm tubes, amphipods, bivalve	Mud bottom; swimming amphipods
CBIW-50	10/7/2021	9:15	43.71786	-70.05139	27.7	-	15.09	7.93	7.51	3.66	gravel	10Y 3/2	cirratulids, bivalve, chiton, snout worms, anomia, brittle star, nemertine, scale worm, sponge, hydrozoans, botrioides, limpet, astartes	Gravel-shellhash with some shells and surficial mud, strong current; Cancer crabs, filamentous algae, eelgrass debris, erect bryozoans, sponge
CBIW-51	10/7/2021	10:34	43.73013	-70.055711	29.9	-	14.54	7.87	7.02	1.89	muddy gravel with shell hash; large cobbles present	5GY 3/2	worm tubes, bryozoans, barnacles, bivalves, limpet, worms, amphipods, olfalina, astartes	Shellhash and gravel; no light
CBIW-52	10/7/2021	12:11	43.748517	-70.067306	29.0	-	14.41	7.85	6.72	2.05	medium to coarse grain sand with trace gravel	2.5Y 3/3	snails, worm tubes, worms, bivalves, shimmy worm	Mud and shellhash; lobster on impact, much snow-poor visibility
CBIW-53	10/19/2021	6:58	43.655987	-70.148463	14.0	-	14.47	7.83	6.66	1.12	rock	N/A	N/A	Gravel and shellhash with veneer of fine sediment on rock; algae, sponge, Cancer crab
CBIW-54	10/19/2021	7:18	43.69927	-70.116656	22.6	-	14.44	7.88	6.35	0.72	silty mud with trace sand	10Y 3/2	worms, worm tubes, snails, bivalves, scalabrignan, cirratulids, shimmy worm, sapotilla	Mud bottom; Cancer crab
CBIW-55	10/19/2021	8:19	43.706947	-70.12905	10.3	-	14.51	7.90	6.48	0.82	gravelly sand with shell hash	2.5Y 2.5/1	small mussels, whelks, sand dollar, cribrilina on drift eel grass, astartes, cancer crab, epifauna, amphipods, brittle star, worms, worm tubes, hermit crab, snails - otostomia, bryozoan, ice cream cone worm	Gravel with shellhash and shells; Cancer crabs, hermit crabs, cunner, shrimp, drift eelgrass and algae
CBIW-56	10/19/2021	9:08	43.714675	-70.110828	17.5	-	14.56	7.91	6.74	1.46	FAILED GRAB	N/A	N/A	Mud bottom with some gravel and shells, Cancer crabs
CBIW-57	10/19/2021	9:32	43.739052	-70.095317	11.2	-	14.74	7.91	6.74	1.93	rock	N/A	N/A	Mud with shells; worm hole, cunner, Cerianthus
CBIW-58	10/19/2021	10:00	43.757935	-70.068187	19.1	-	14.63	7.93	7.03	3.59	sandy mud with shell hash	5Y 2.5/2	amphipods, whelk, worm tube, segmented worm, snout worm, bivalves	Rock covered with fine sediments; algae coated with Didemnum



Site Name	Collection Date	Collection Time (EDT)	Latitude (DD)	Longitude (DD)	Depth (m)	Bottom Salinity	Bottom Temp (C)	Bottom pH	Bottom DO mg L <sup>-1</sup>	Bottom CHL µg L <sup>-1</sup>	Grain size (field observation)	Grain color (field observation)	Infauna collection notes	Video Notes
CBIW-59	10/19/2021	10:51	43.755613	-70.121337	8.8	-	15.26	7.98	7.53	5.60	silty mud with trace sand	GLE Y1 2.5/10Y	worm tubes, bivalves, worms, amphipods, shrimp	Mud bottom; drift algae covering bottom
CBIW-60	11/3/2021	9:49	43.752286	-70.130831	13.8	31.43	12.49	7.91	7.94	10.76	silty clayey mud with trace sand	5Y 3/1	sea cucumber, lot of organic material, yoldia (bivalve), nephtys, bivalves	Mud bottom; video completely obscured
CBIW-61	11/3/2021	8:41	43.74242596	-70.14284794	9.7	31.43	12.49	7.91	7.94	8.37	clayey silty mud with trace sand	2.5Y 3/2	lumbrereria, worm tubes, bivalves, whelk, snails, amphipods	Mud bottom; video completely obscured
CBIW-62	11/3/2021	7:32	43.716613	-70.174988	15.3	31.65	12.50	7.89	7.96	3.30	silty mud	2.5Y 3/2	shimmy worm, worm tubes, scalabrignan, sea cucumbers, bivalves, shrimp, whelk	Mud bottom; rock left field of view, depressions, worm hole
CBIW-63	11/3/2021	11:07	43.70421848	-70.1586773	12.7	31.76	12.41	7.91	8.20	2.97	muddy sand with gravel; large cobbles present	2.5Y 2.5/1	sandy tubes, worms, sea squirts, amphipods, nephtys, worm tubes	Mud-sand bottom with shells; drift eelgrass
CBIW-64	11/3/2021	12:06	43.69636432	-70.17142183	29.0	31.96	12.51	7.90	7.82	2.71	muddy sand with gravel	5Y 2.5/1	worm tubes, many amphipods, bivalves, cirianthis, snails, sea squirt, maldanin	Mud bottom with shells; drift eelgrass
CBIW-65	11/3/2021	13:24	43.69512988	-70.17277361	26.8	31.91	12.45	7.90	7.84	2.58	muddy sand with gravel	5Y 3/2	hermit crab, worm tubes, snails, bivalves, amphipods, maldanin	Sand-mud bottom, shells; algae, Cancer crab, snails
CBIW-66	11/9/2021	10:23	43.61377584	-70.20254247	18.7	31.28	11.80	7.89	8.30	5.69	fine sand	2.5Y 3/2	worms, bivalves, snails, amphipods, sand dollar, corofiad	Bottom not visible; video completely obscured
CBIW-67	11/9/2021	8:22	43.62130717	-70.1979111	15.3	31.53	11.79	7.90	8.33	4.65	fine sand	10Y 4/2	sand dollars, worms, worm tubes, hermit crab	Bottom not visible; video completely obscured
CBIW-68	11/9/2021	8:49	43.63655605	-70.21108881	11.9	31.14	11.59	7.90	8.42	4.23	muddy sand with trace shell hash	10YR 3/2	sand dollars, amphipods, worm tubes, worms, snails, nephtys	Sand with shells; sand dollars, drift eelgrass, drift algae
CBIW-69	11/9/2021	9:53	43.63436966	-70.19546016	15.4	31.43	11.68	7.90	8.46	3.00	sandy gravel with shall hash; many large cobbles present	2.5Y 2.5/1	worm, barnacles, anomia, capetula, snails, worm tubes, bryozoans, algae, brittle star	Gravel, shellhash, shells; drift algae, hermit crab, barnacle scars
CBIW-70	11/9/2021	7:11	43.66881435	-70.16238554	17.8	31.77	11.96	7.85	8.11	3.41	shell hash; no mud visible in sample at all	5Y 4/2	worm tubes, snails, worms, astartes, bivalves, hermit crab, cone worm, crab	Bottom lacks detail for assessment
CBIW-71	11/9/2021	8:06	43.64186621	-70.18256615	10.3	31.41	11.60	7.89	8.45	3.33	rock	N/A	N/A	Hard bottom, shellhash, shell, gravel; Laminaria coated with bryozoan, algae, drift algae

## Appendix B – Sediment Grab Field Pictures and/or Bottom Images

Still Image from Video	Field Picture	
<div data-bbox="583 391 1316 529" style="border: 1px solid black; padding: 10px; margin: 0 auto; width: fit-content;"> <h3>EXAMPLE LAYOUT DESCRIPTIONS</h3> </div>		
<div data-bbox="239 542 926 922" style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p><i>Image of seafloor extracted from video file.</i></p> <p><i>Green lasers are spaced 10 cm apart for scale. Scale is approximate for images/video lacking true reference scale (e.g. lasers).</i></p> <p><i>Note: Lasers and visibility in general are obscured in some images as a result of turbidity.</i></p> </div> <p><b>Substrate Type:</b> Sediment textural class based on field description; subject to change pending results of grain-size analyses</p>	<div data-bbox="974 542 1661 922" style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p><i>Field picture of sediment sample taken immediately upon retrieval.</i></p> <p><i>This block will appear as NO SAMPLE RECOVERED for sites where no physical sample was recovered; typically rocky or gravelly sites too coarse for retrieval with sampler or where total volume of sample was too low for both infauna and sediment analysis.</i></p> </div>	
	Sample ID:	MT-000 (sample identification number)
	Date/Time (EST) of sampling event:	mm/dd/yy 00:00 (eastern-standard time, 24-hr)
	Depth (real-time, m):	Real-time depth (meters) observed by hull-mounted, single-beam fathometer
	Easting (WGS84 UTM Zone 19N, m):	Approximate horizontal position uncertainty ± 10 meters
	Northing (WGS84 UTM Zone 19N, m):	Approximate horizontal position uncertainty ± 10 meters

Still Image from Video	Field Picture										
 <p data-bbox="789 1052 961 1076">Laser spacing = 10 cm</p> <p data-bbox="436 1101 768 1141"><b>Substrate Type: rock</b></p>	<p data-bbox="1283 643 1549 727" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>										
	<table border="1"> <tr> <td data-bbox="541 1159 1016 1201">Sample ID:</td> <td data-bbox="1016 1159 1799 1201">CBO60-1</td> </tr> <tr> <td data-bbox="541 1201 1016 1243">Date/Time (EST):</td> <td data-bbox="1016 1201 1799 1243">07/14/21 08:12</td> </tr> <tr> <td data-bbox="541 1243 1016 1286">Depth (real-time, m):</td> <td data-bbox="1016 1243 1799 1286">86.7</td> </tr> <tr> <td data-bbox="541 1286 1016 1344">Easting (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1286 1799 1344">432127.8</td> </tr> <tr> <td data-bbox="541 1344 1016 1398">Northing (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1344 1799 1398">4823831</td> </tr> </table>	Sample ID:	CBO60-1	Date/Time (EST):	07/14/21 08:12	Depth (real-time, m):	86.7	Easting (WGS84 UTM Zone 19N, m):	432127.8	Northing (WGS84 UTM Zone 19N, m):	4823831
Sample ID:	CBO60-1										
Date/Time (EST):	07/14/21 08:12										
Depth (real-time, m):	86.7										
Easting (WGS84 UTM Zone 19N, m):	432127.8										
Northing (WGS84 UTM Zone 19N, m):	4823831										

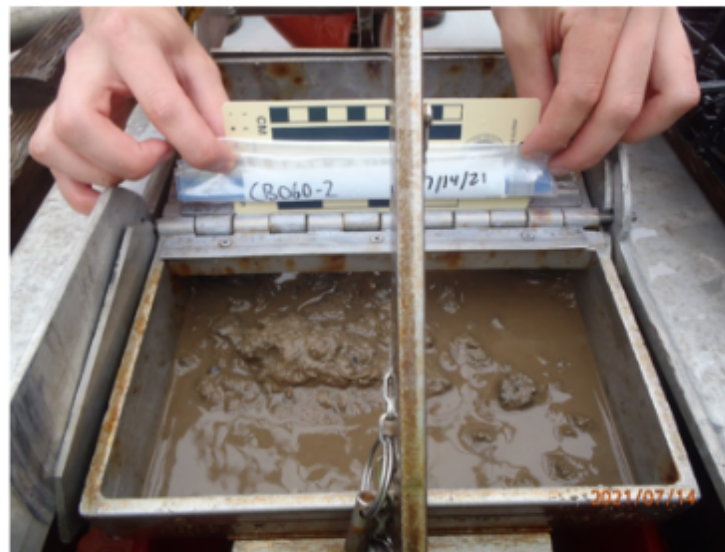
Still Image from Video

**NO VIDEO  
RECORDED**

Laser spacing = 10 cm

**Substrate Type: gravelly muddy sand**

Field Picture



Sample ID:	CBO60-2
Date/Time (EST):	07/14/21 08:33
Depth (real-time, m):	80.0
Easting (WGS84 UTM Zone 19N, m):	429751.5
Northing (WGS84 UTM Zone 19N, m):	4823172

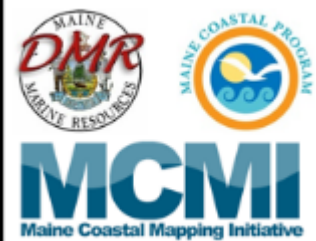
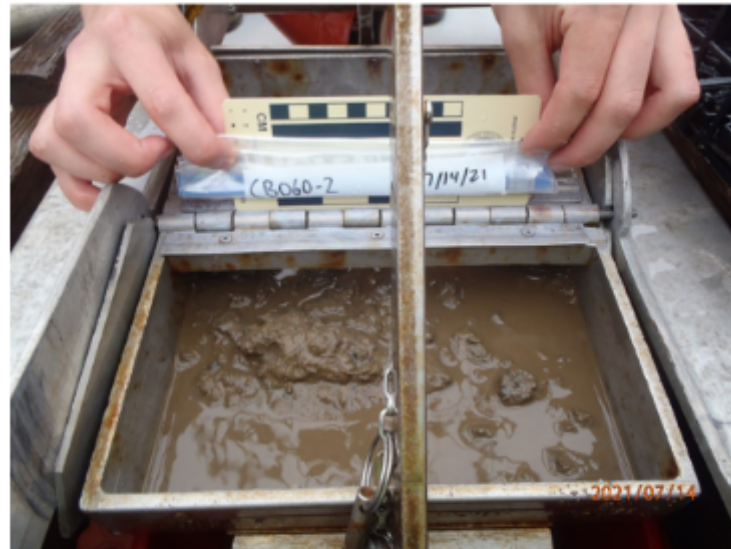
**Still Image from Video**

**NO VIDEO  
RECORDED**

Laser spacing = 10 cm

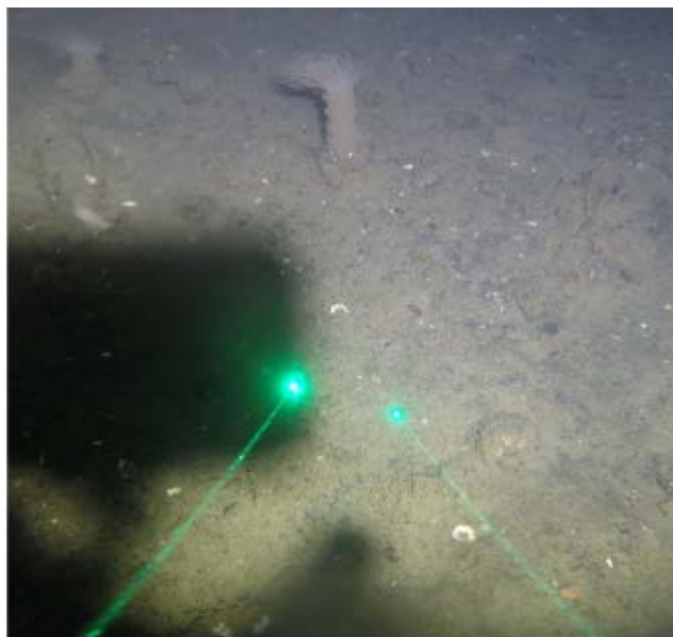
**Substrate Type: gravelly muddy sand**

**Field Picture**



Sample ID:	CBO60-2
Date/Time (EST):	07/14/21 08:33
Depth (real-time, m):	80.0
Easting (WGS84 UTM Zone 19N, m):	429751.5
Northing (WGS84 UTM Zone 19N, m):	4823172

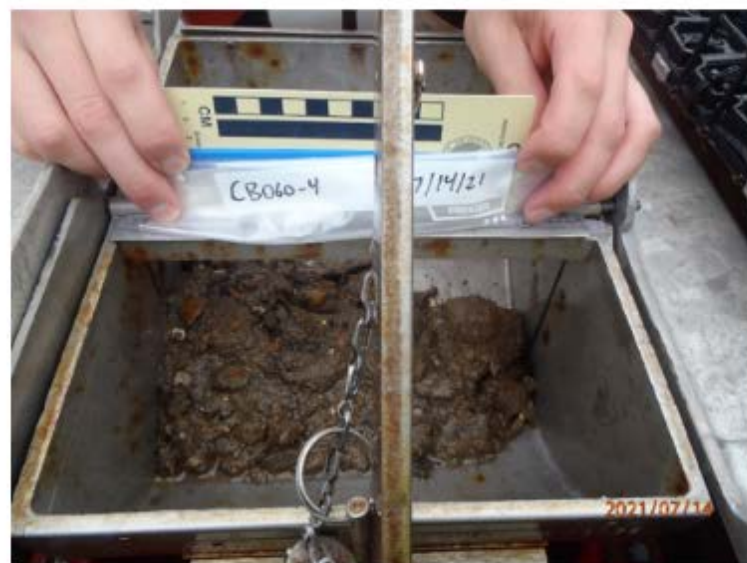
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: muddy gravel**

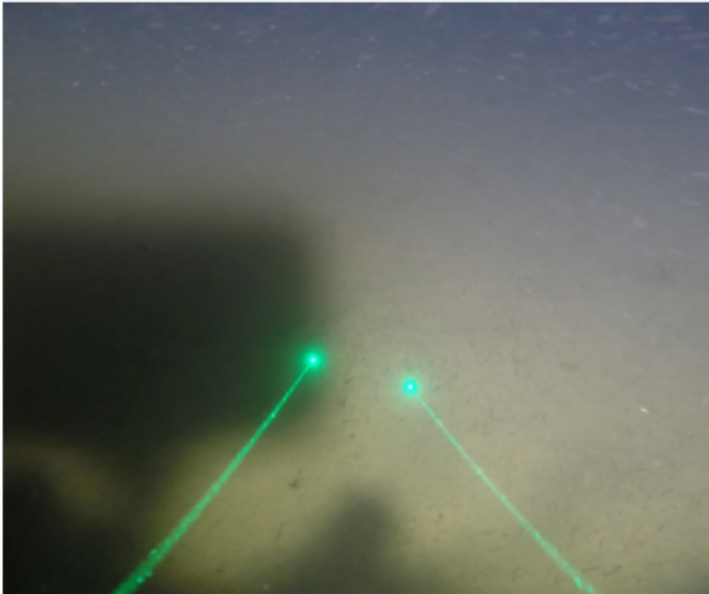
**Field Picture**



Sample ID:	CBO60-4
Date/Time (EST):	07/14/21 09:44
Depth (real-time, m):	66.2
Easting (WGS84 UTM Zone 19N, m):	428937.8
Northing (WGS84 UTM Zone 19N, m):	4824813



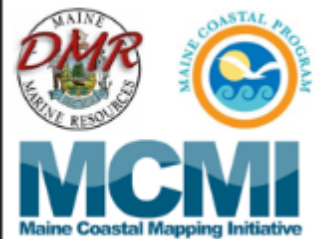
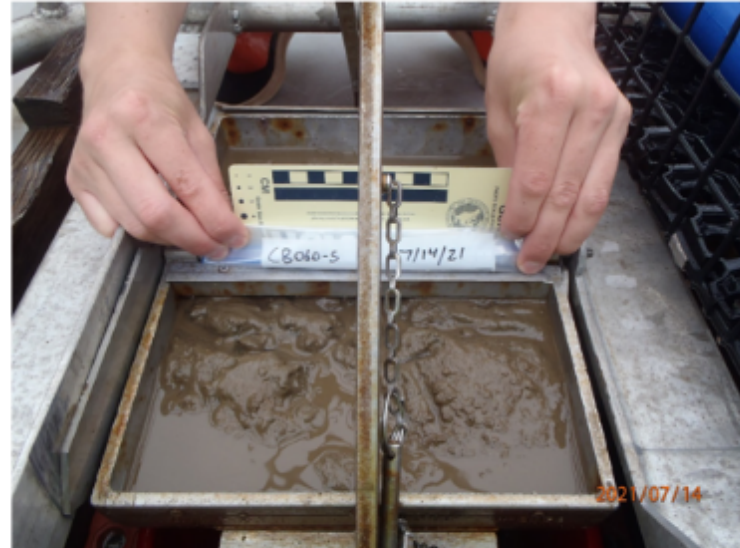
**Still Image from Video**



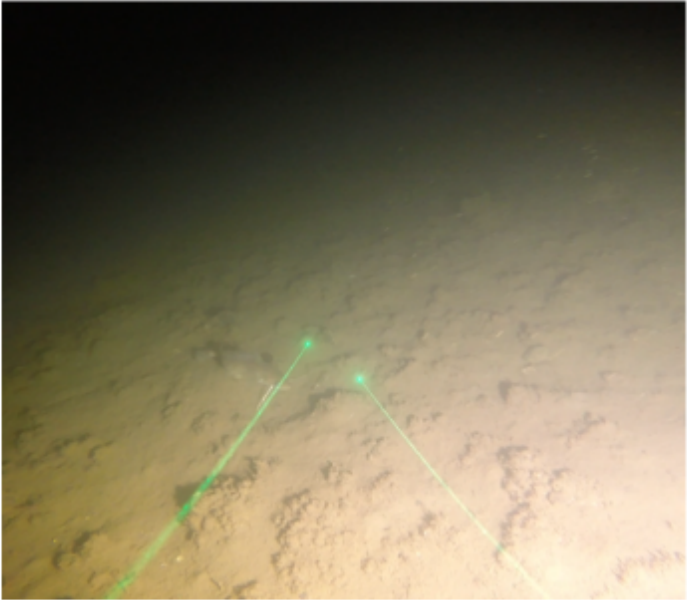
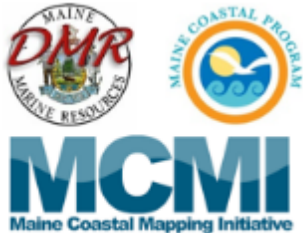
Laser spacing = 10 cm

**Substrate Type:** mud with shell hash

**Field Picture**

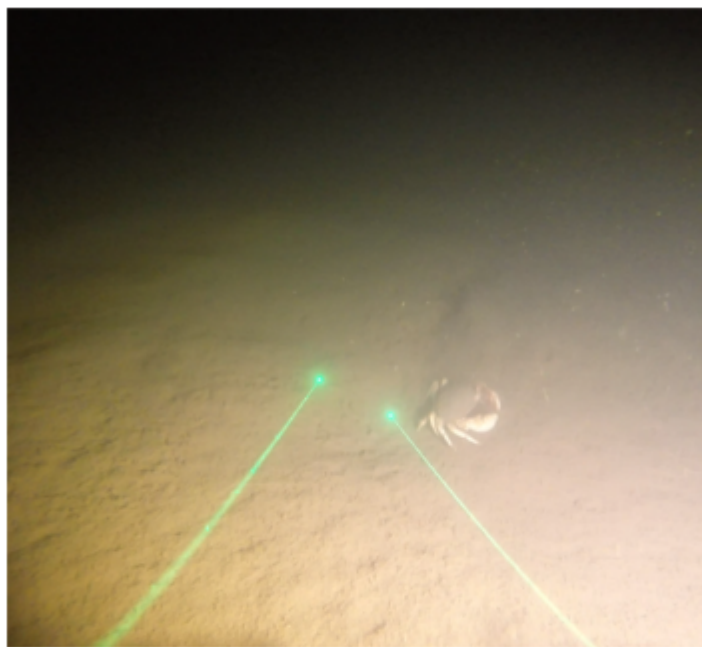


Sample ID:	CBO60-5
Date/Time (EST):	07/14/20 10:14
Depth (real-time, m):	89.3
Easting (WGS84 UTM Zone 19N, m):	431120.7
Northing (WGS84 UTM Zone 19N, m):	4826496

Still Image from Video	Field Picture										
 <p data-bbox="831 1057 1003 1081">Laser spacing = 10 cm</p> <p data-bbox="453 1094 783 1133"><b>Substrate Type: rock</b></p>	<p data-bbox="1283 672 1549 760" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>										
	<table border="1"> <tbody> <tr> <td data-bbox="539 1154 1016 1198">Sample ID:</td> <td data-bbox="1016 1154 1812 1198">CBO60-6</td> </tr> <tr> <td data-bbox="539 1198 1016 1247">Date/Time (EST):</td> <td data-bbox="1016 1198 1812 1247">07/27/21 07:13</td> </tr> <tr> <td data-bbox="539 1247 1016 1295">Depth (real-time, m):</td> <td data-bbox="1016 1247 1812 1295">83.1</td> </tr> <tr> <td data-bbox="539 1295 1016 1349">Easting (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1295 1812 1349">422667.1</td> </tr> <tr> <td data-bbox="539 1349 1016 1398">Northing (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1349 1812 1398">4819928</td> </tr> </tbody> </table>	Sample ID:	CBO60-6	Date/Time (EST):	07/27/21 07:13	Depth (real-time, m):	83.1	Easting (WGS84 UTM Zone 19N, m):	422667.1	Northing (WGS84 UTM Zone 19N, m):	4819928
Sample ID:	CBO60-6										
Date/Time (EST):	07/27/21 07:13										
Depth (real-time, m):	83.1										
Easting (WGS84 UTM Zone 19N, m):	422667.1										
Northing (WGS84 UTM Zone 19N, m):	4819928										



Still Image from Video



Laser spacing = 10 cm

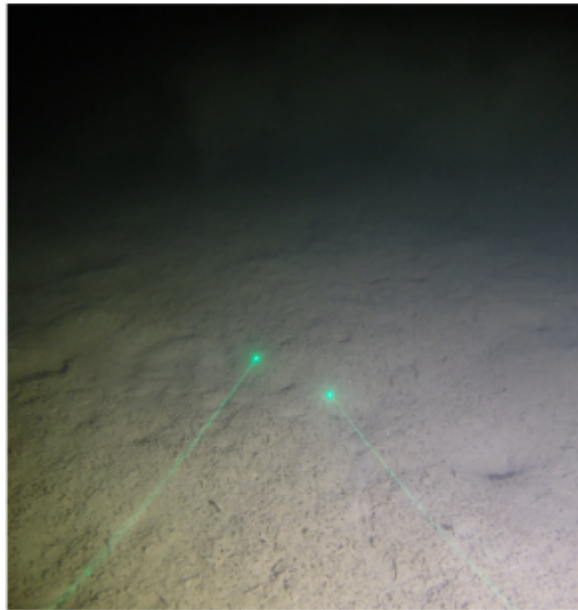
**Substrate Type:** silty mud with trace sand

Field Picture



Sample ID:	CBO60-7
Date/Time (EST):	07/27/21 07:32
Depth (real-time, m):	103.0
Easting (WGS84 UTM Zone 19N, m):	423977.6
Northing (WGS84 UTM Zone 19N, m):	4818826

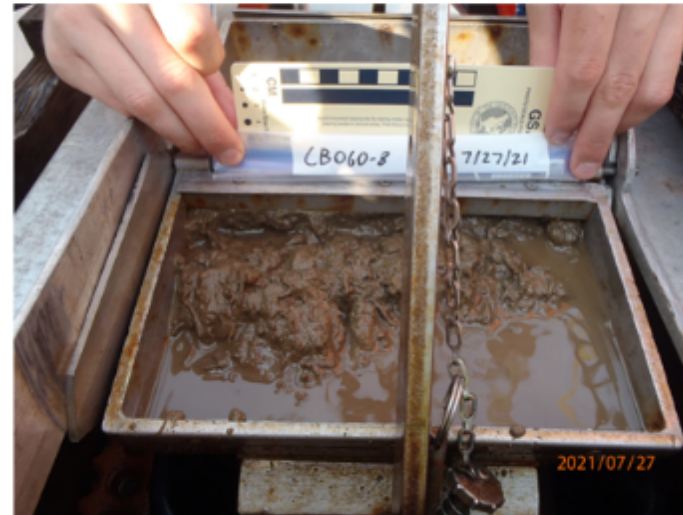
Still Image from Video



Laser spacing = 10 cm

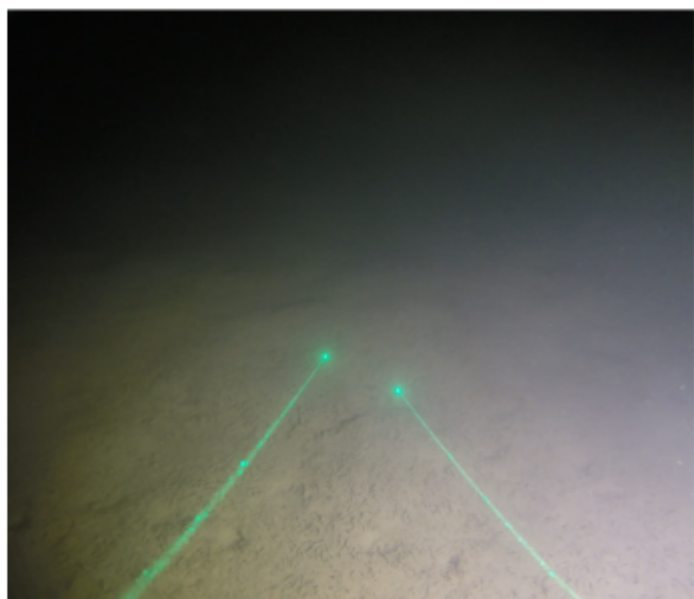
**Substrate Type:** clayey sandy mud with trace sand and gravel

Field Picture



Sample ID:	CBO60-8
Date/Time (EST):	07/27/21 08:19
Depth (real-time, m):	89.2
Easting (WGS84 UTM Zone 19N, m):	421051.7
Northing (WGS84 UTM Zone 19N, m):	4820250

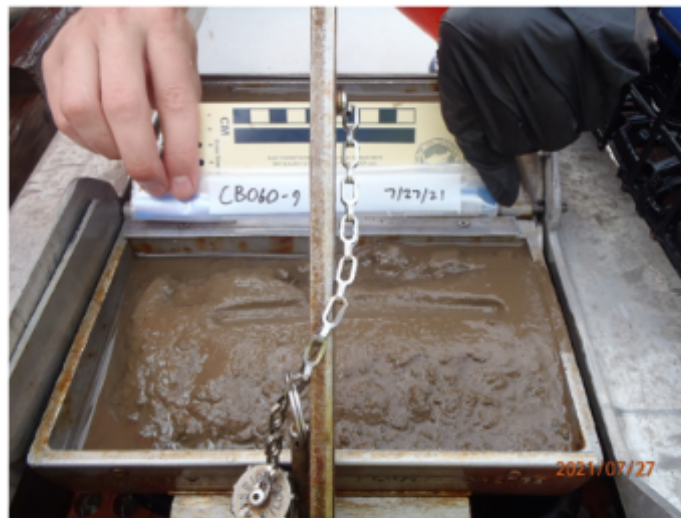
Still Image from Video



Laser spacing = 10 cm

**Substrate Type:** silty mud with trace sand

Field Picture



Sample ID:	CBO60-9
Date/Time (EST):	07/27/21 09:24
Depth (real-time, m):	105.0
Easting (WGS84 UTM Zone 19N, m):	421984.1
Northing (WGS84 UTM Zone 19N, m):	4821667

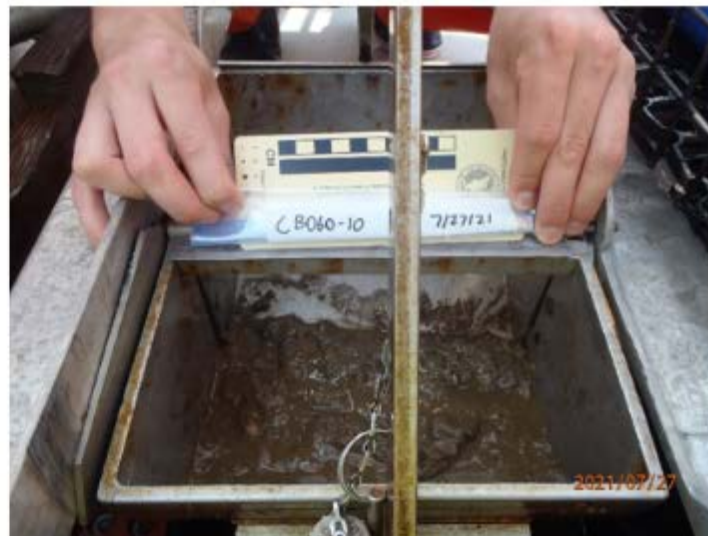
Still Image from Video



Laser spacing = 10 cm

**Substrate Type:** sandy gravel with mud assumed atop rock due to low yield

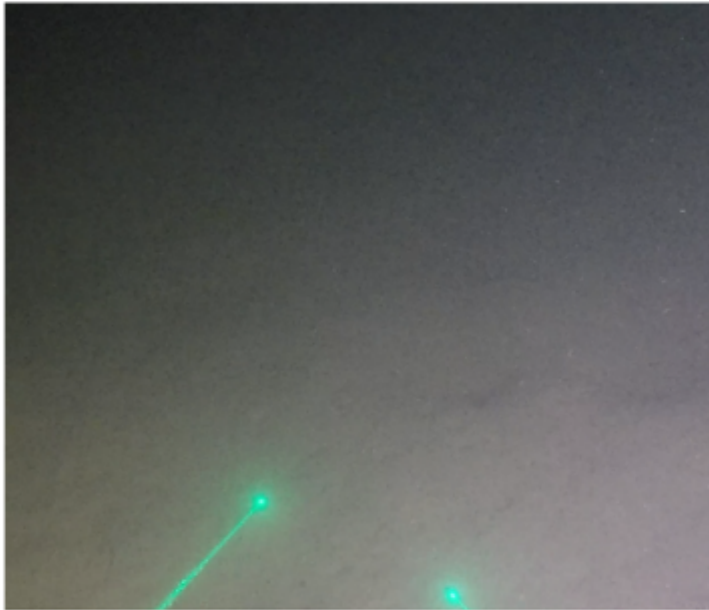
Field Picture



Sample ID:	CBO60-10
Date/Time (EST):	07/27/21 10:19
Depth (real-time, m):	69.8
Easting (WGS84 UTM Zone 19N, m):	423152.8
Northing (WGS84 UTM Zone 19N, m):	4822682



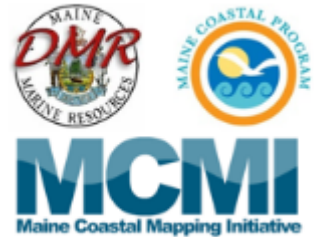
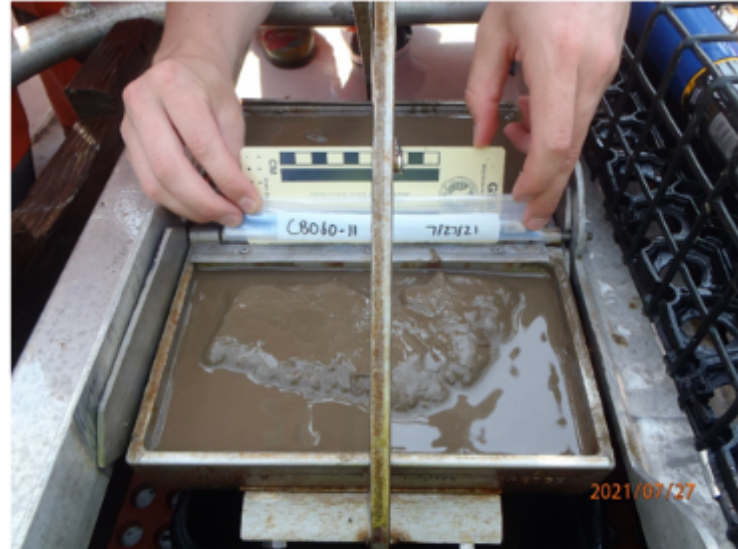
**Still Image from Video**



Laser spacing = 10 cm

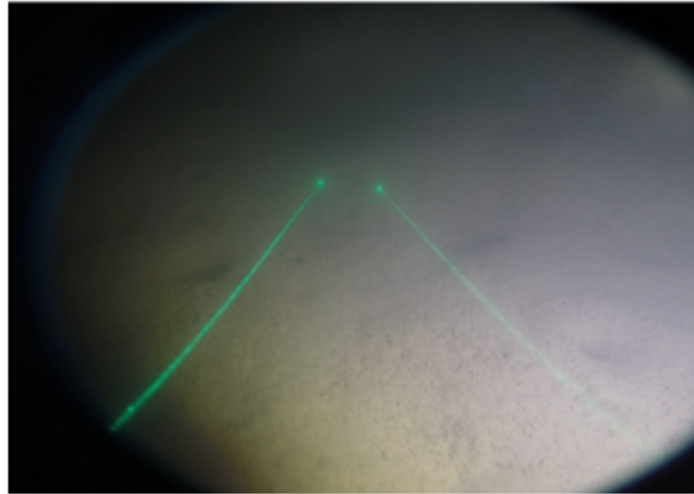
**Substrate Type: silty mud with trace sand**

**Field Picture**



Sample ID:	CBO60-11
Date/Time (EST):	07/27/21 10:45
Depth (real-time, m):	93.6
Easting (WGS84 UTM Zone 19N, m):	422563.5
Northing (WGS84 UTM Zone 19N, m):	4825402

Still Image from Video



Laser spacing = 10 cm

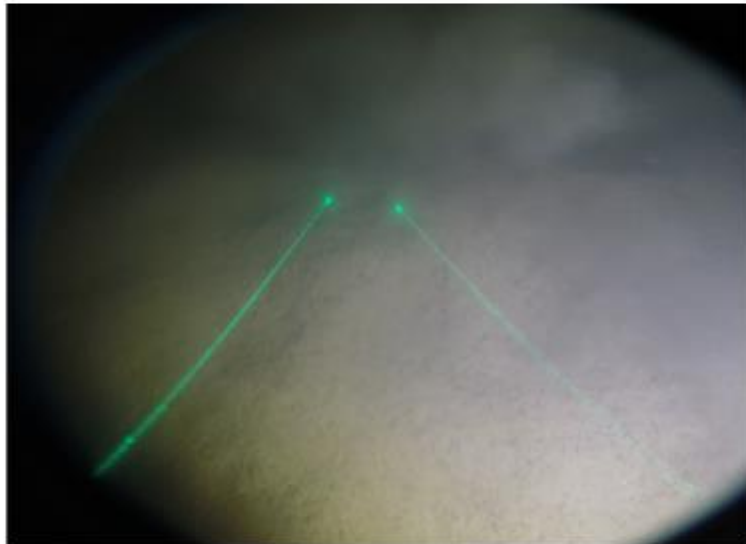
**Substrate Type:** silty mud with trace sand

Field Picture



Sample ID:	CBO60-12
Date/Time (EST):	08/04/21 07:22
Depth (real-time, m):	95.8
Easting (WGS84 UTM Zone 19N, m):	425979.3
Northing (WGS84 UTM Zone 19N, m):	4821931

Still Image from Video



Laser spacing = 10 cm

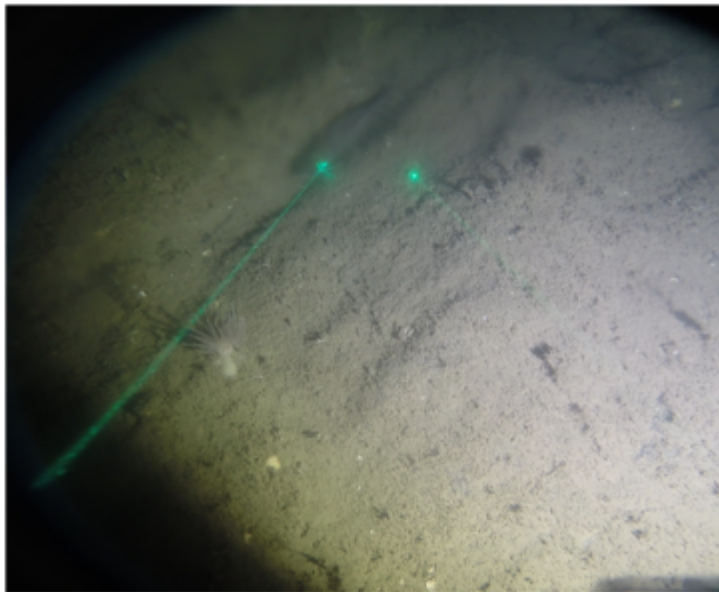
**Substrate Type:** clayey silty mud with trace sand

Field Picture



Sample ID:	CBO60-13
Date/Time (EST):	08/04/21 08:54
Depth (real-time, m):	85.7
Easting (WGS84 UTM Zone 19N, m):	428085.2
Northing (WGS84 UTM Zone 19N, m):	4824612

Still Image from Video



Laser spacing = 10 cm

**Substrate Type: rock**

Field Picture

**NO SAMPLE  
RECOVERED**



Sample ID:

CBO60-14

Date/Time (EST):

08/04/21 10:10

Depth (real-time, m):

70.2

Easting (WGS84 UTM Zone 19N, m):

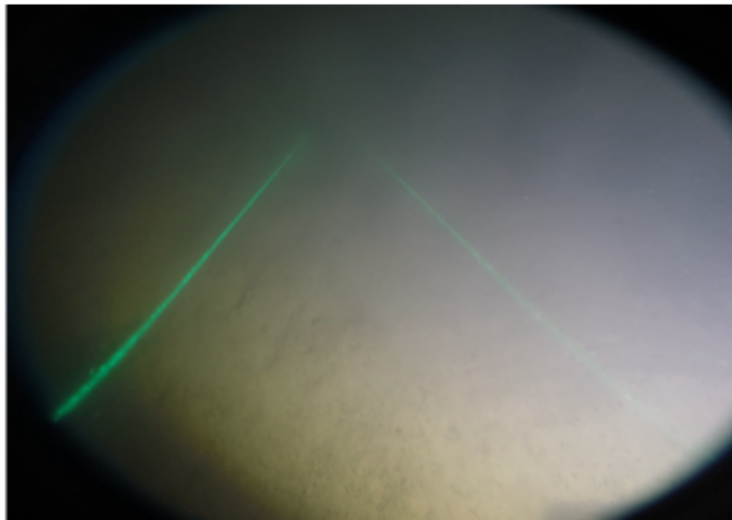
426485.3

Northing (WGS84 UTM Zone 19N, m):

4825649



**Still Image from Video**



Laser spacing = 10 cm

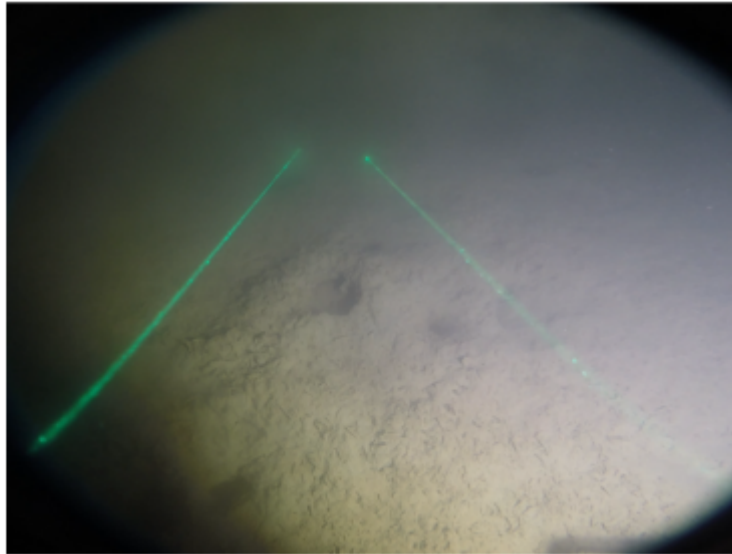
**Substrate Type:** clayey mud with trace sand

**Field Picture**



Sample ID:	CBO60-15
Date/Time (EST):	08/04/21 11:46
Depth (real-time, m):	88.3
Easting (WGS84 UTM Zone 19N, m):	424389.2
Northing (WGS84 UTM Zone 19N, m):	4827244

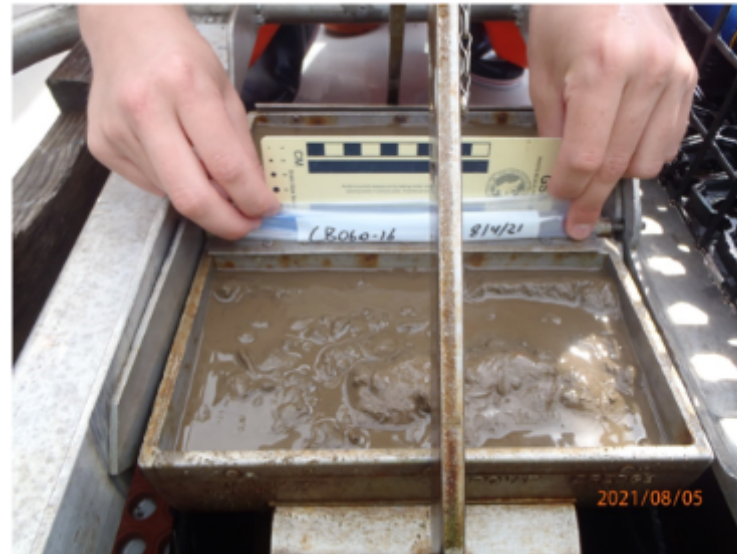
**Still Image from Video**



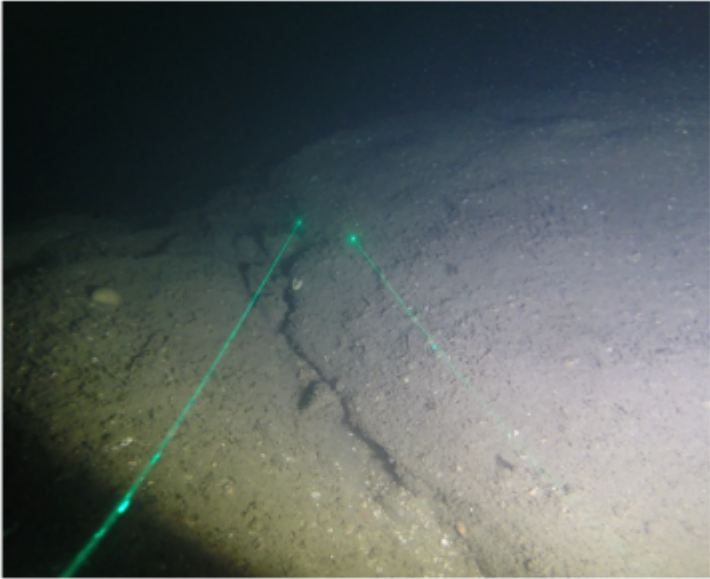

Laser spacing = 10 cm

**Substrate Type:** clayey silty mud with trace sand

**Field Picture**



Sample ID:	CBO60-16
Date/Time (EST):	08/04/21 10:28
Depth (real-time, m):	89.6
Easting (WGS84 UTM Zone 19N, m):	426894
Northing (WGS84 UTM Zone 19N, m):	4826702

Still Image from Video	Field Picture	
 <p data-bbox="804 987 976 1011">Laser spacing = 10 cm</p> <p data-bbox="445 1052 779 1092"><b>Substrate Type: rock</b></p>	<p data-bbox="1283 626 1556 711" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>	
	<p data-bbox="884 1166 1003 1190">Sample ID:</p>	<p data-bbox="1373 1166 1465 1190">CBO-17</p>
	<p data-bbox="814 1214 1003 1239">Date/Time (EST):</p>	<p data-bbox="1339 1214 1503 1239">08/10/21 07:20</p>
	<p data-bbox="785 1263 1003 1287">Depth (real-time, m):</p>	<p data-bbox="1394 1263 1444 1287">39.0</p>
	<p data-bbox="604 1312 1003 1336">Easting (WGS84 UTM Zone 19N, m):</p>	<p data-bbox="1373 1312 1472 1336">427426.4</p>
	<p data-bbox="590 1360 1003 1385">Northing (WGS84 UTM Zone 19N, m):</p>	<p data-bbox="1373 1360 1472 1385">4831979</p>

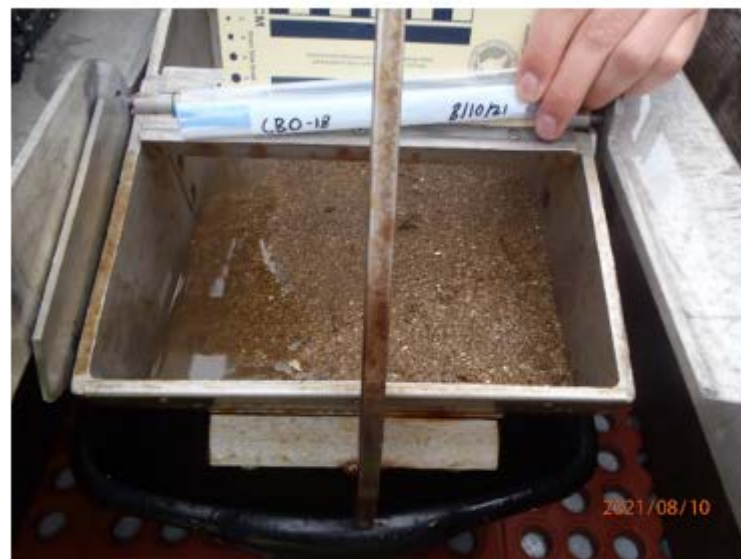
**Still Image from Video**




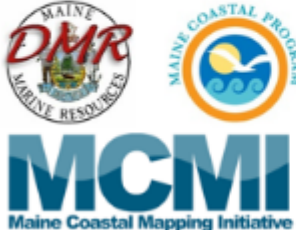
Laser spacing = 10 cm

**Substrate Type:** sand with shell hash and trace gravel

**Field Picture**

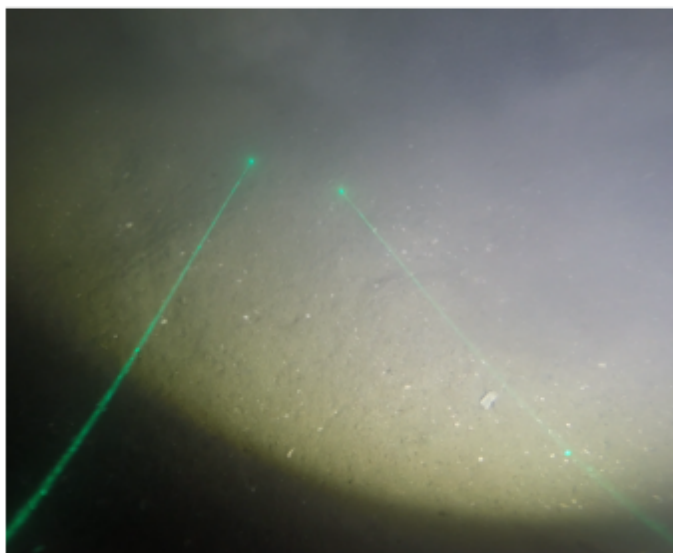


Sample ID:	CBO-18
Date/Time (EST):	08/10/21 07:34
Depth (real-time, m):	45.4
Easting (WGS84 UTM Zone 19N, m):	428264.5
Northing (WGS84 UTM Zone 19N, m):	4831279

Still Image from Video	Field Picture										
 <p data-bbox="814 987 982 1013">Laser spacing = 10 cm</p> <p data-bbox="453 1062 785 1101"><b>Substrate Type: rock</b></p>	<p data-bbox="1293 620 1562 704" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>										
	<table border="1"> <tr> <td data-bbox="539 1159 1016 1203">Sample ID:</td> <td data-bbox="1016 1159 1822 1203">CBO-19</td> </tr> <tr> <td data-bbox="539 1203 1016 1252">Date/Time (EST):</td> <td data-bbox="1016 1203 1822 1252">08/10/21 08:40</td> </tr> <tr> <td data-bbox="539 1252 1016 1300">Depth (real-time, m):</td> <td data-bbox="1016 1252 1822 1300">42.0</td> </tr> <tr> <td data-bbox="539 1300 1016 1349">Easting (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1300 1822 1349">428450</td> </tr> <tr> <td data-bbox="539 1349 1016 1403">Northing (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1349 1822 1403">4830106</td> </tr> </table>	Sample ID:	CBO-19	Date/Time (EST):	08/10/21 08:40	Depth (real-time, m):	42.0	Easting (WGS84 UTM Zone 19N, m):	428450	Northing (WGS84 UTM Zone 19N, m):	4830106
Sample ID:	CBO-19										
Date/Time (EST):	08/10/21 08:40										
Depth (real-time, m):	42.0										
Easting (WGS84 UTM Zone 19N, m):	428450										
Northing (WGS84 UTM Zone 19N, m):	4830106										



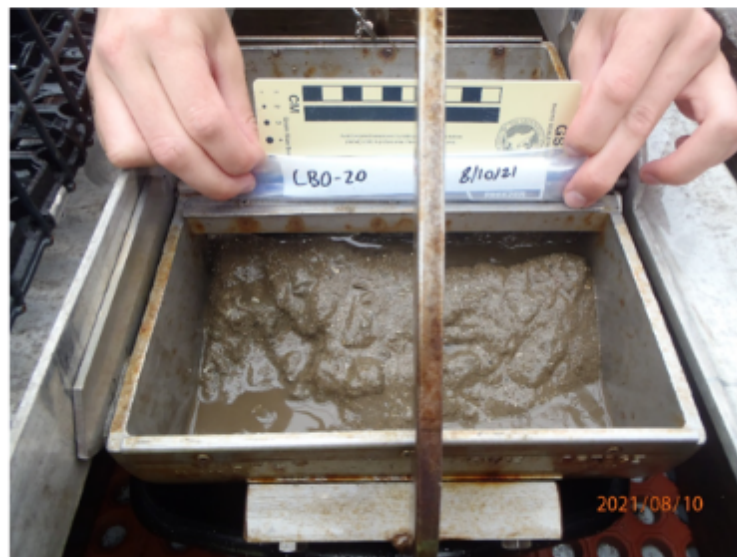
**Still Image from Video**



Laser spacing = 10 cm

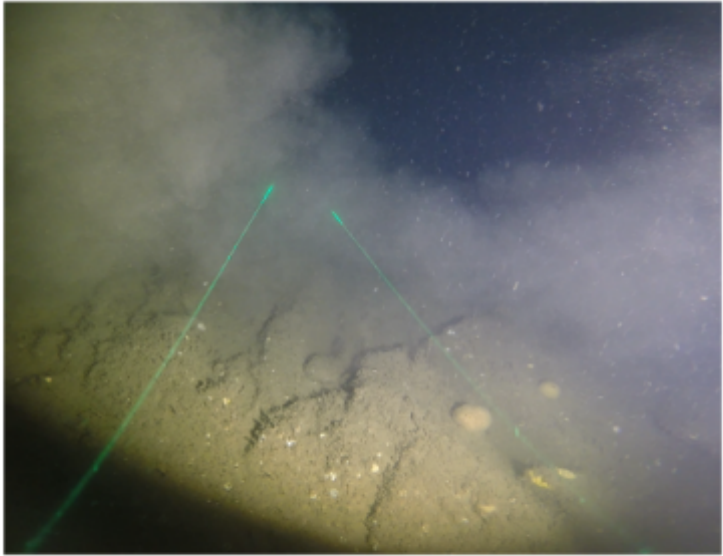

**Substrate Type:** clayey muddy sand

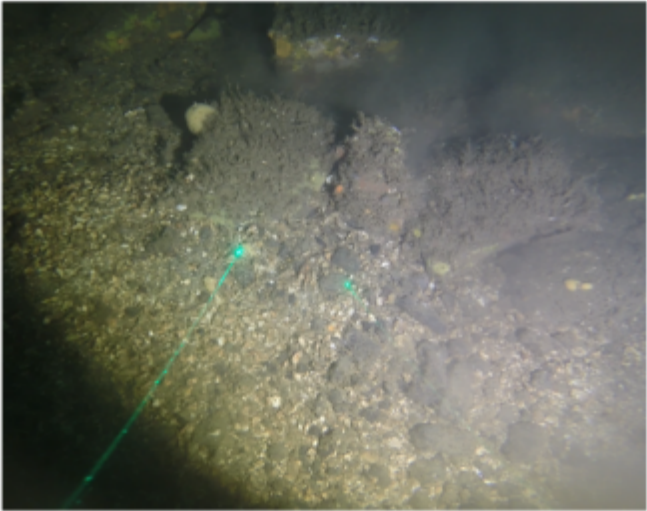

**Field Picture**



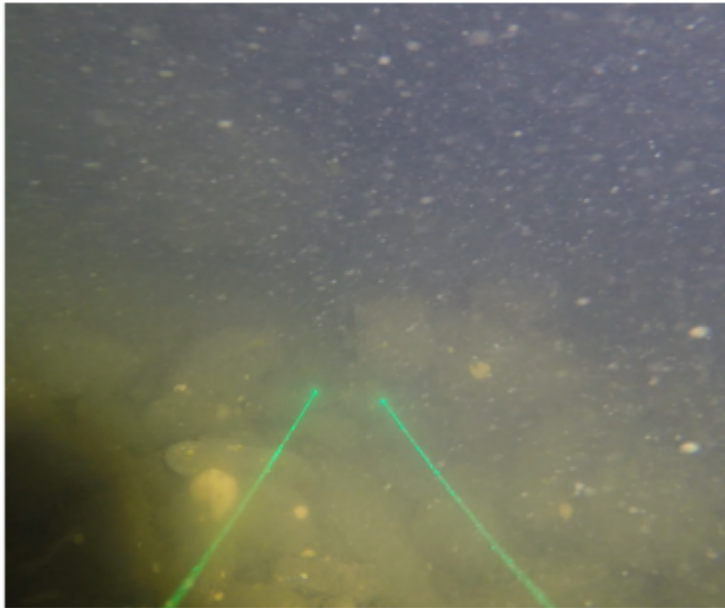
Sample ID:	CBO-20
Date/Time (EST):	08/10/21 08:54
Depth (real-time, m):	60.0
Easting (WGS84 UTM Zone 19N, m):	427945.7
Northing (WGS84 UTM Zone 19N, m):	4830881



Still Image from Video	Field Picture										
 <p data-bbox="814 1036 989 1057">Laser spacing = 10 cm</p> <p data-bbox="451 1094 781 1130"><b>Substrate Type: rock</b></p>	<p data-bbox="1289 662 1556 748" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>										
	<table border="1"> <tbody> <tr> <td data-bbox="541 1157 1016 1200">Sample ID:</td> <td data-bbox="1016 1157 1810 1200">CBO-21</td> </tr> <tr> <td data-bbox="541 1200 1016 1248">Date/Time (EST):</td> <td data-bbox="1016 1200 1810 1248">08/10/21 10:32</td> </tr> <tr> <td data-bbox="541 1248 1016 1297">Depth (real-time, m):</td> <td data-bbox="1016 1248 1810 1297">48.0</td> </tr> <tr> <td data-bbox="541 1297 1016 1349">Easting (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1297 1810 1349">427179.6</td> </tr> <tr> <td data-bbox="541 1349 1016 1401">Northing (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1016 1349 1810 1401">4831353</td> </tr> </tbody> </table>	Sample ID:	CBO-21	Date/Time (EST):	08/10/21 10:32	Depth (real-time, m):	48.0	Easting (WGS84 UTM Zone 19N, m):	427179.6	Northing (WGS84 UTM Zone 19N, m):	4831353
Sample ID:	CBO-21										
Date/Time (EST):	08/10/21 10:32										
Depth (real-time, m):	48.0										
Easting (WGS84 UTM Zone 19N, m):	427179.6										
Northing (WGS84 UTM Zone 19N, m):	4831353										

Still Image from Video	Field Picture										
 <p data-bbox="821 1045 991 1068">Laser spacing = 10 cm</p> <p data-bbox="302 1105 936 1141"><b>Substrate Type:</b> surficial gravel atop rock</p>	<p data-bbox="1295 675 1562 760" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>										
	<table border="1"> <tbody> <tr> <td data-bbox="537 1157 1020 1206">Sample ID:</td> <td data-bbox="1020 1157 1822 1206">CBO-22</td> </tr> <tr> <td data-bbox="537 1206 1020 1255">Date/Time (EST):</td> <td data-bbox="1020 1206 1822 1255">08/10/21 10:47</td> </tr> <tr> <td data-bbox="537 1255 1020 1304">Depth (real-time, m):</td> <td data-bbox="1020 1255 1822 1304">38.0</td> </tr> <tr> <td data-bbox="537 1304 1020 1352">Easting (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1020 1304 1822 1352">426683.0</td> </tr> <tr> <td data-bbox="537 1352 1020 1409">Northing (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1020 1352 1822 1409">4831341</td> </tr> </tbody> </table>	Sample ID:	CBO-22	Date/Time (EST):	08/10/21 10:47	Depth (real-time, m):	38.0	Easting (WGS84 UTM Zone 19N, m):	426683.0	Northing (WGS84 UTM Zone 19N, m):	4831341
Sample ID:	CBO-22										
Date/Time (EST):	08/10/21 10:47										
Depth (real-time, m):	38.0										
Easting (WGS84 UTM Zone 19N, m):	426683.0										
Northing (WGS84 UTM Zone 19N, m):	4831341										

**Still Image from Video**



Laser spacing = 10 cm

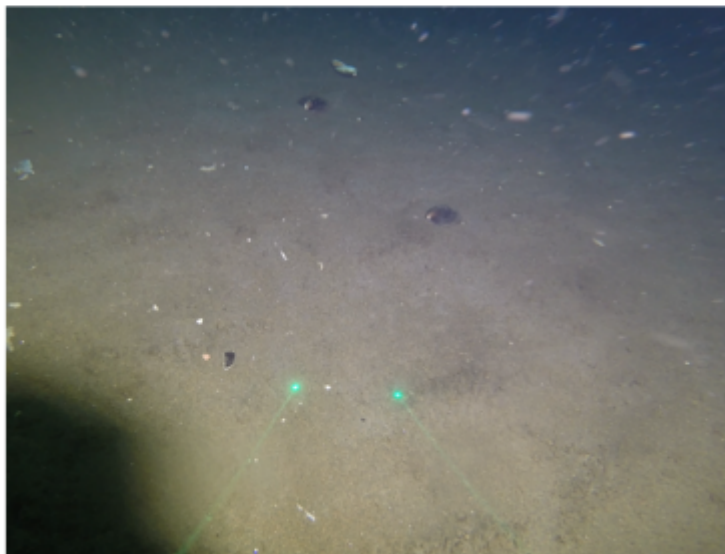
**Substrate Type: rock**

**Field Picture**



Sample ID:	CBO-23
Date/Time (EST):	09/01/22 07:29
Depth (real-time, m):	52.7
Easting (WGS84 UTM Zone 19N, m):	431859.7
Northing (WGS84 UTM Zone 19N, m):	4830683

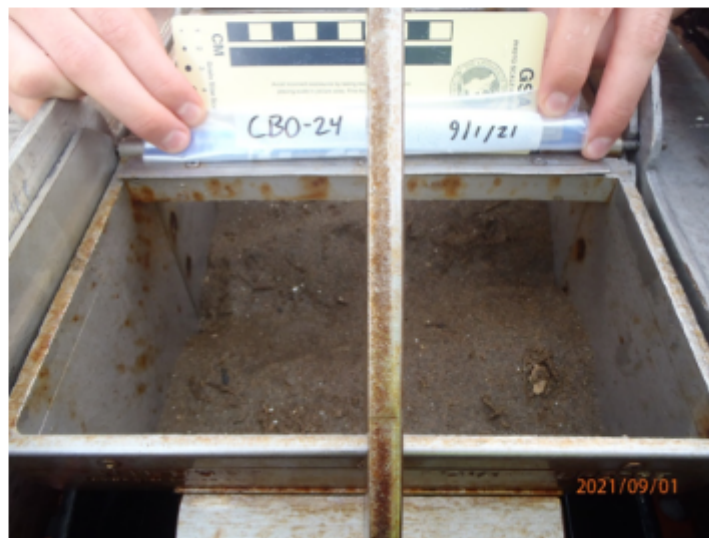
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: sand**

**Field Picture**

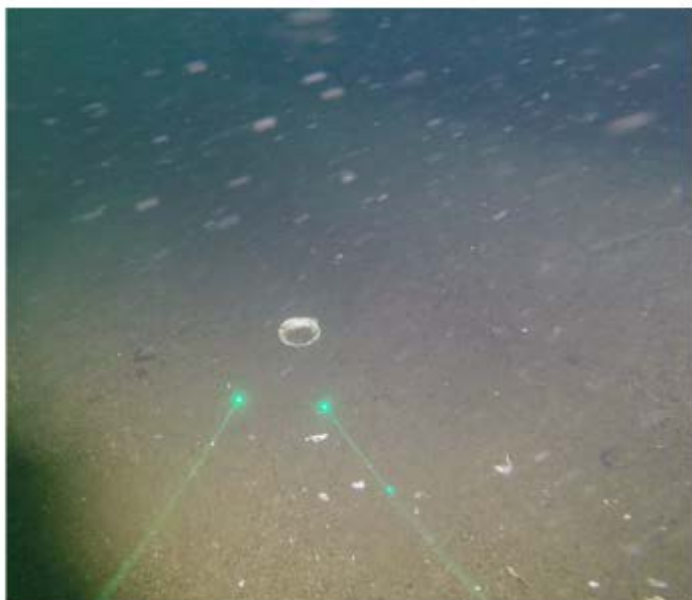


2021/09/01



Sample ID:	CBO-24
Date/Time (EST):	09/01/21 07:48
Depth (real-time, m):	37.2
Easting (WGS84 UTM Zone 19N, m):	431917.4
Northing (WGS84 UTM Zone 19N, m):	4833354

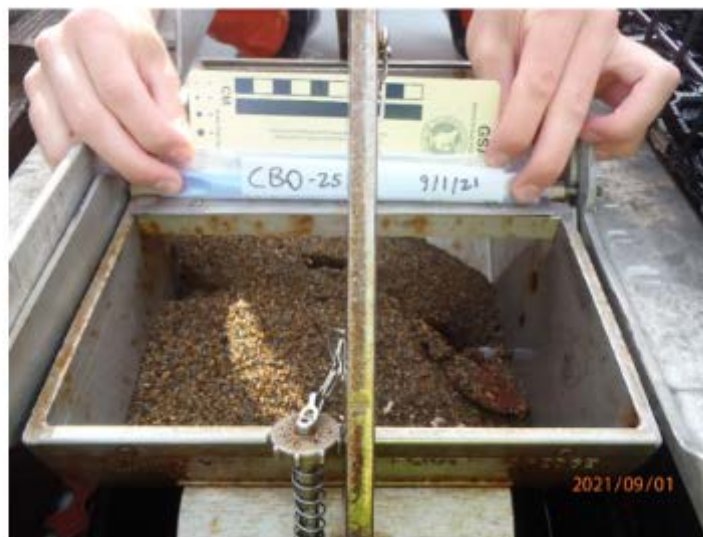
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** gravel with shell hash, some mud

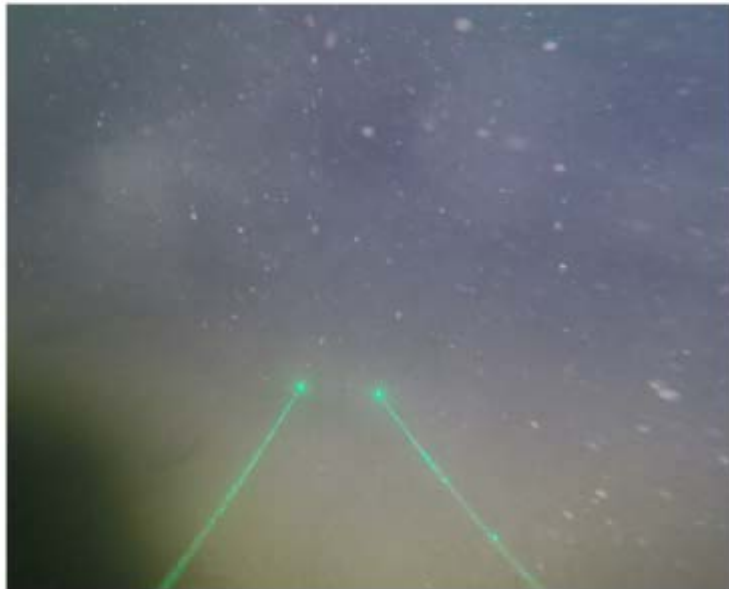
**Field Picture**



Sample ID:	CBO-25
Date/Time (EST):	09/430071 01/21 08:41
Depth (real-time, m):	31.7
Easting (WGS84 UTM Zone 19N, m):	430071.0
Northing (WGS84 UTM Zone 19N, m):	4835224



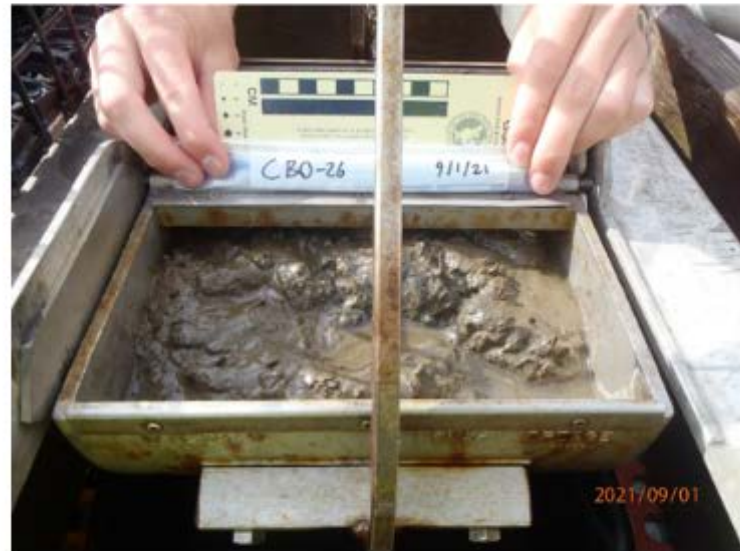
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: silty clayey mud**

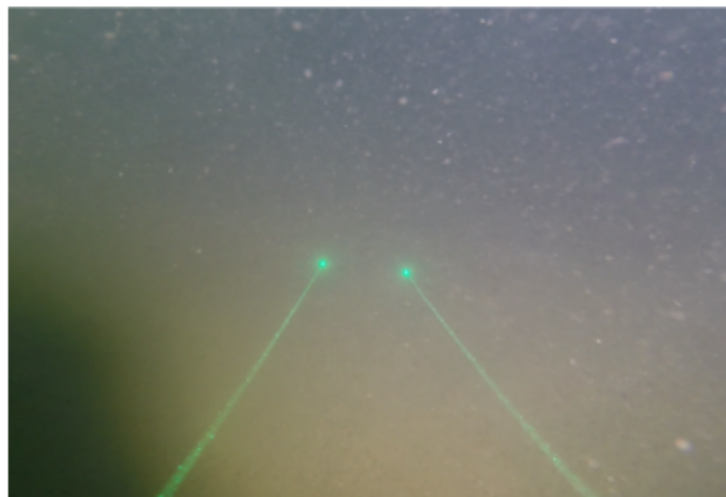
**Field Picture**



Sample ID:	CBO-26
Date/Time (EST):	09/01/21 09:26
Depth (real-time, m):	42.3
Easting (WGS84 UTM Zone 19N, m):	427069.7
Northing (WGS84 UTM Zone 19N, m):	4836550



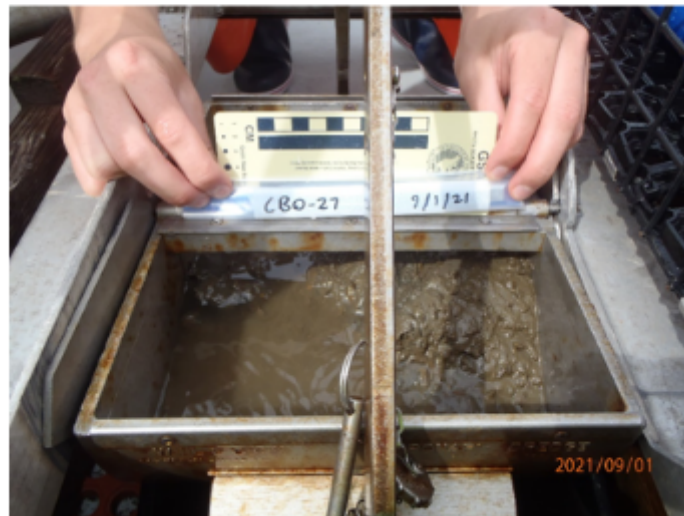
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: clayey mud**

**Field Picture**



Sample ID:	CBO-27
Date/Time (EST):	09/01/21 10:56
Depth (real-time, m):	36.3
Easting (WGS84 UTM Zone 19N, m):	424685.8
Northing (WGS84 UTM Zone 19N, m):	4839249

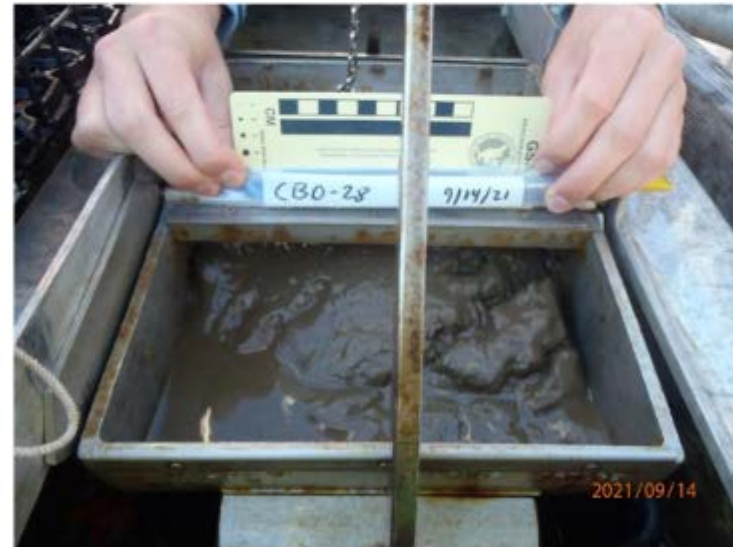
**Still Image from Video**



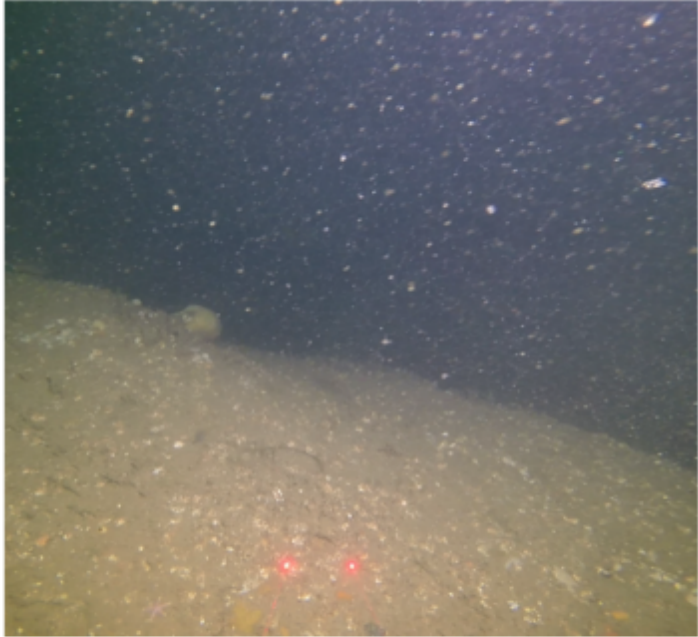
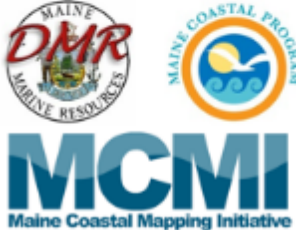
Laser spacing = 10 cm

**Substrate Type:** clayey mud with trace sand and gravel

**Field Picture**



Sample ID:	CBO-28
Date/Time (EST):	09/14/21 07:48
Depth (real-time, m):	60.9
Easting (WGS84 UTM Zone 19N, m):	425440.8
Northing (WGS84 UTM Zone 19N, m):	4831649

Still Image from Video	Field Picture										
 <p data-bbox="814 1040 989 1062">Laser spacing = 10 cm</p> <p data-bbox="443 1097 772 1135"><b>Substrate Type: rock</b></p>	<p data-bbox="1283 654 1549 740" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>										
	<table border="1"> <tr> <td data-bbox="533 1154 1014 1203">Sample ID:</td> <td data-bbox="1014 1154 1818 1203">CBO-29</td> </tr> <tr> <td data-bbox="533 1203 1014 1252">Date/Time (EST):</td> <td data-bbox="1014 1203 1818 1252">09/14/21 09:06</td> </tr> <tr> <td data-bbox="533 1252 1014 1300">Depth (real-time, m):</td> <td data-bbox="1014 1252 1818 1300">40.4</td> </tr> <tr> <td data-bbox="533 1300 1014 1349">Easting (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1014 1300 1818 1349">422739.8</td> </tr> <tr> <td data-bbox="533 1349 1014 1409">Northing (WGS84 UTM Zone 19N, m):</td> <td data-bbox="1014 1349 1818 1409">4829735</td> </tr> </table>	Sample ID:	CBO-29	Date/Time (EST):	09/14/21 09:06	Depth (real-time, m):	40.4	Easting (WGS84 UTM Zone 19N, m):	422739.8	Northing (WGS84 UTM Zone 19N, m):	4829735
Sample ID:	CBO-29										
Date/Time (EST):	09/14/21 09:06										
Depth (real-time, m):	40.4										
Easting (WGS84 UTM Zone 19N, m):	422739.8										
Northing (WGS84 UTM Zone 19N, m):	4829735										

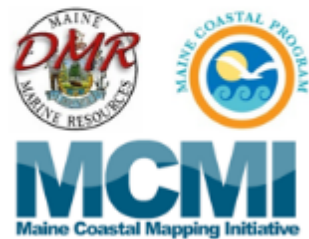
**Still Image from Video**

**SEAFLOOR  
NOT VISIBLE  
IN VIDEO  
FEED**

Laser spacing = 10 cm

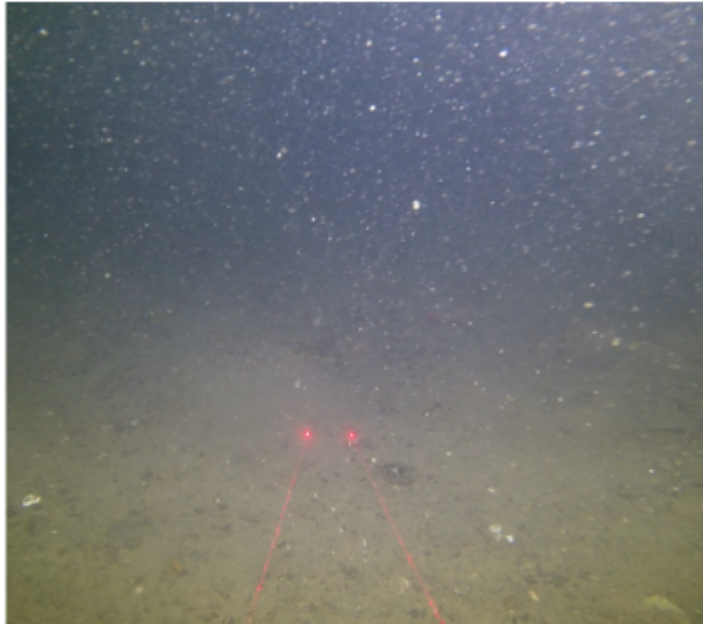
**Substrate Type:** gravelly sandy mud with shell hash

**Field Picture**



Sample ID:	CBO-30
Date/Time (EST):	09/14/21 09:28
Depth (real-time, m):	52.6
Easting (WGS84 UTM Zone 19N, m):	421567.9
Northing (WGS84 UTM Zone 19N, m):	4828687

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: rock**

**Field Picture**

**NO SAMPLE  
RECOVERED**



Sample ID:	CBO-31
Date/Time (EST):	09/14/21 10:33
Depth (real-time, m):	43.7
Easting (WGS84 UTM Zone 19N, m):	418945.6
Northing (WGS84 UTM Zone 19N, m):	4829533



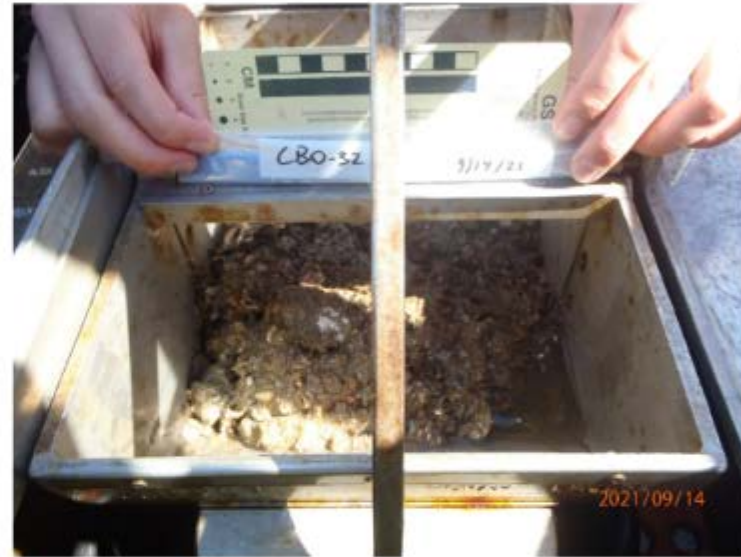
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** muddy gravel with shell hash

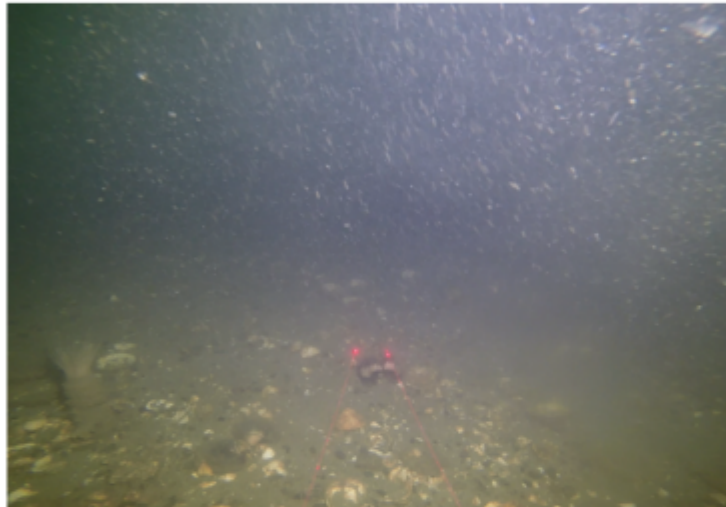
**Field Picture**



Sample ID:	CBO-32
Date/Time (EST):	09/14/21 11:06
Depth (real-time, m):	41.0
Easting (WGS84 UTM Zone 19N, m):	421102.0
Northing (WGS84 UTM Zone 19N, m):	4832729

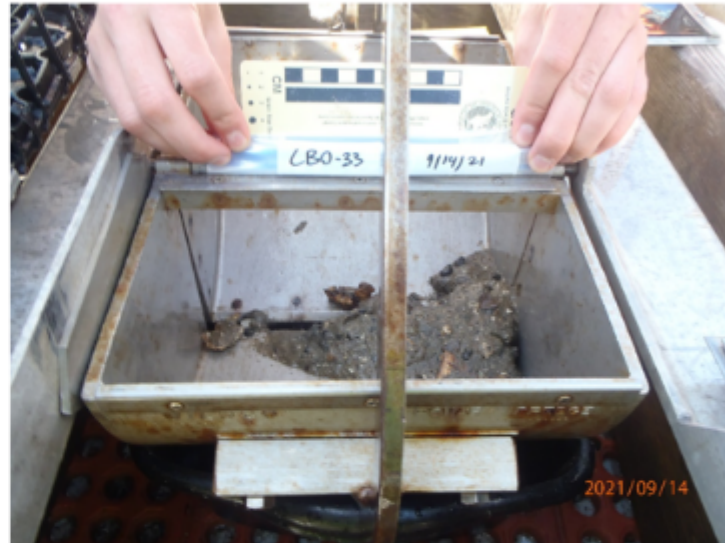


**Still Image from Video**



Laser spacing = 10 cm

**Field Picture**

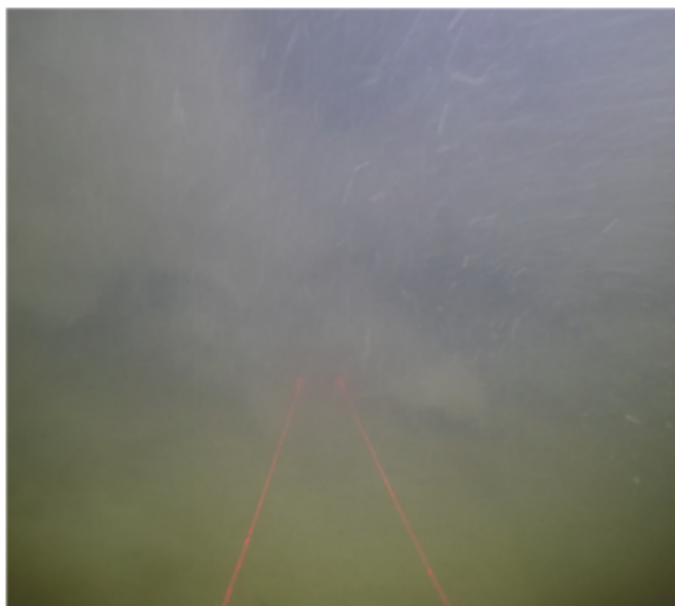


**Substrate Type:** surficial mud and shell hash atop rock



Sample ID:	CBO-33
Date/Time (EST):	09/14/21 12:13
Depth (real-time, m):	41.9
Easting (WGS84 UTM Zone 19N, m):	424820.9
Northing (WGS84 UTM Zone 19N, m):	4833696

**Still Image from Video**



Laser spacing = 10 cm

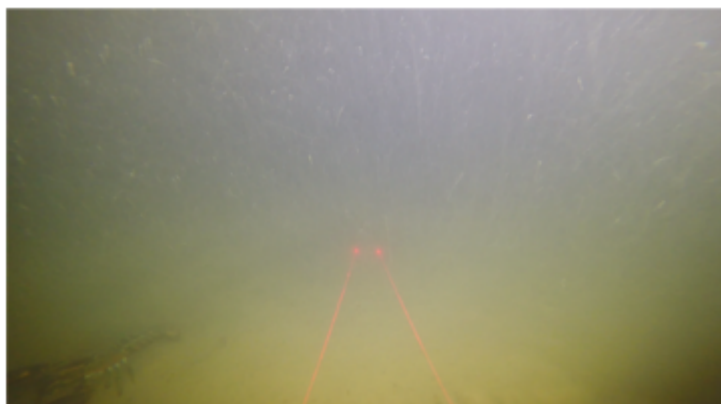
**Substrate Type:** clayey mud with trace fine sand

**Field Picture**



Sample ID:	CBO-34
Date/Time (EST):	09/21/21 08:18
Depth (real-time, m):	49.8
Easting (WGS84 UTM Zone 19N, m):	421055.3
Northing (WGS84 UTM Zone 19N, m):	4836733

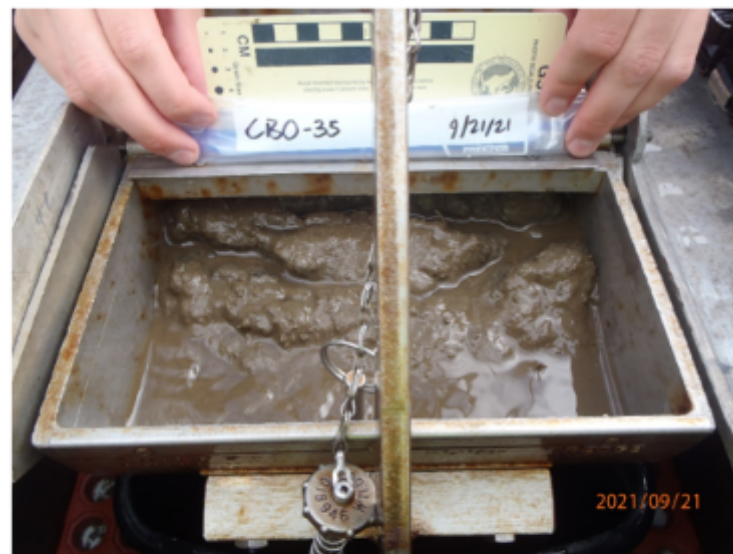
**Still Image from Video**



Laser spacing = 10 cm

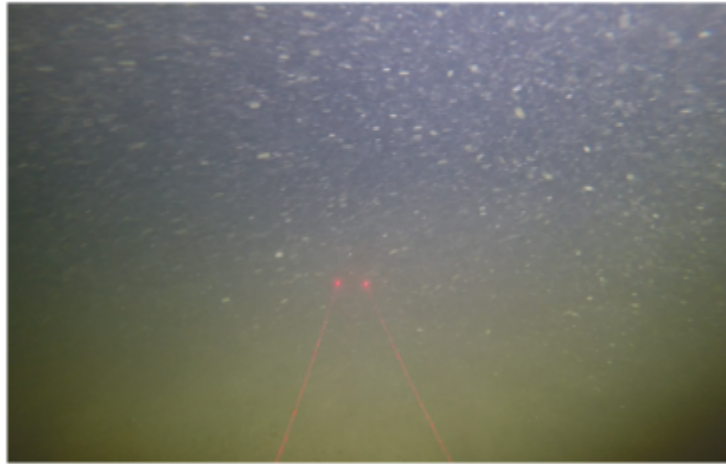
**Substrate Type:** clayey mud with trace fine sand

**Field Picture**



Sample ID:	CBO-35
Date/Time (EST):	09/21/21 09:15
Depth (real-time, m):	55.6
Easting (WGS84 UTM Zone 19N, m):	421573.3
Northing (WGS84 UTM Zone 19N, m):	4834397

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** clayey mud with trace coarse grain sand and gravel

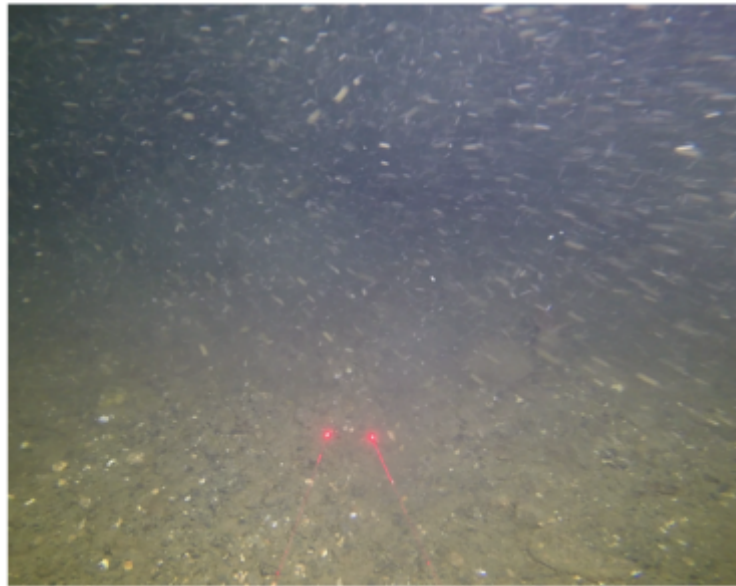
**Field Picture**



Sample ID:	CBO-36
Date/Time (EST):	09/21/21 10:11
Depth (real-time, m):	55.1
Easting (WGS84 UTM Zone 19N, m):	419077.8
Northing (WGS84 UTM Zone 19N, m):	4833242



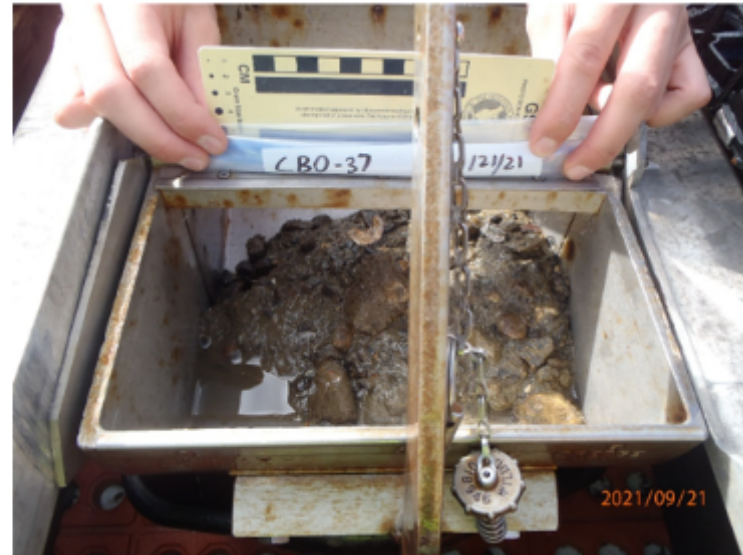
Still Image from Video



Laser spacing = 10 cm

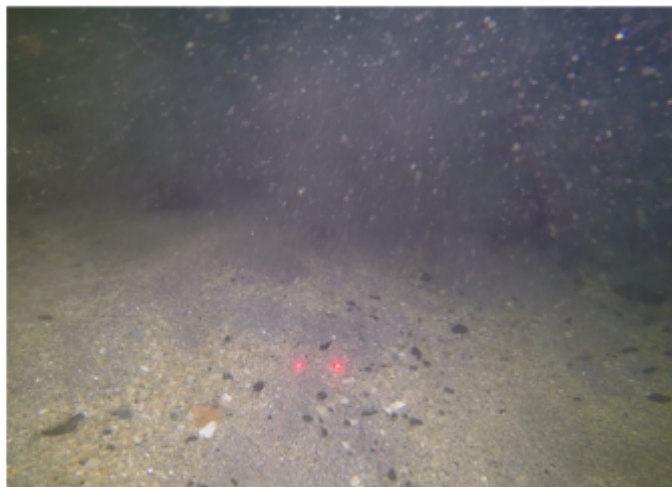
**Substrate Type:** muddy gravel with coarse sand

Field Picture



Sample ID:	CBO-37
Date/Time (EST):	09/21/21 11:02
Depth (real-time, m):	42.3
Easting (WGS84 UTM Zone 19N, m):	415050.3
Northing (WGS84 UTM Zone 19N, m):	4831836

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** surficial shell hash atop rock

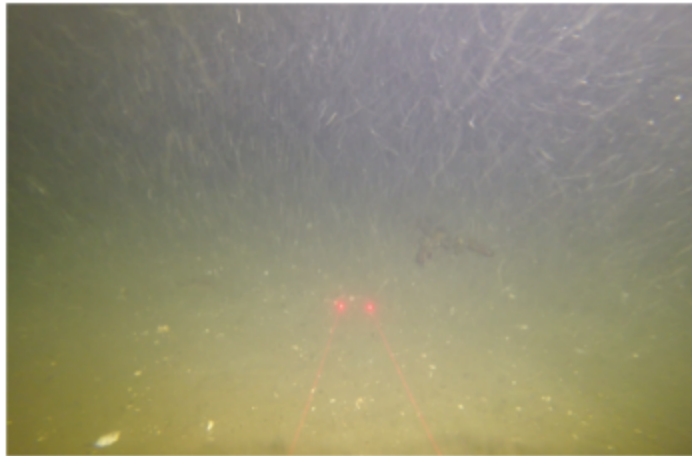
**Field Picture**



Sample ID:	CBO-38
Date/Time (EST):	09/21/21 11:36
Depth (real-time, m):	39.3
Easting (WGS84 UTM Zone 19N, m):	415830.7
Northing (WGS84 UTM Zone 19N, m):	4834563



**Still Image from Video**




Laser spacing = 10 cm

**Substrate Type:** gravelly muddy sand with shell hash

**Field Picture**



Sample ID:	CBO-39
Date/Time (EST):	09/21/21 12:18
Depth (real-time, m):	52.2
Easting (WGS84 UTM Zone 19N, m):	418544.4
Northing (WGS84 UTM Zone 19N, m):	4835270

Still Image from Video	Field Picture
 <p data-bbox="877 1105 1079 1130">Laser spacing = 10 cm</p> <p data-bbox="464 1166 837 1206"><b>Substrate Type: rock</b></p>	<p data-bbox="1423 678 1730 776" style="text-align: center;"><b>NO SAMPLE RECOVERED</b></p>



Sample ID:	CBO-40
Date/Time (EST):	10/07/21 07:03
Depth (real-time, m):	35.7
Easting (WGS84 UTM Zone 19N, m):	418587.0
Northing (WGS84 UTM Zone 19N, m):	4837371

**Still Image from Video**



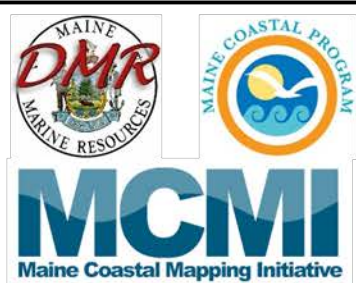
Laser spacing = 10 cm

**Substrate Type: muddy gravel**

**Field Picture**



2021/10/07



Sample ID:	CBO-41	
Date/Time (EST):	10/07/21 07:17	
Depth (real-time, m):	60.3	
Easting (WGS84 UTM Zone 19N, m):	415237.9	63
Northing (WGS84 UTM Zone 19N, m):	4837393	

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: muddy gravel**

**Field Picture**



Sample ID:	CBO-42	
Date/Time (EST):	10/07/21 08:04	
Depth (real-time, m):	39.5	
Easting (WGS84 UTM Zone 19N, m):	413626.3	64
Northing (WGS84 UTM Zone 19N, m):	4839994	



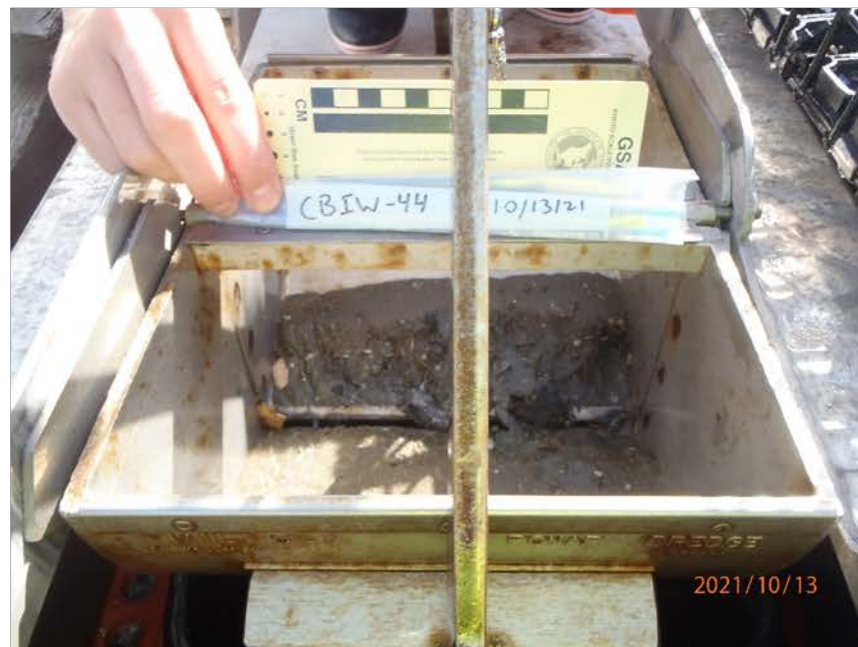
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: gravelly sand**

**Field Picture**



2021/10/13



Sample ID:	CBIW-44	
Date/Time (EST):	10/13/21 10:17	
Depth (real-time, m):	17.4	
Easting (WGS84 UTM Zone 19N, m):	402539.5	65
Northing (WGS84 UTM Zone 19N, m):	4828540	



**Still Image from Video**

**Field Picture**



Laser spacing = 10 cm

**Substrate Type: rock**

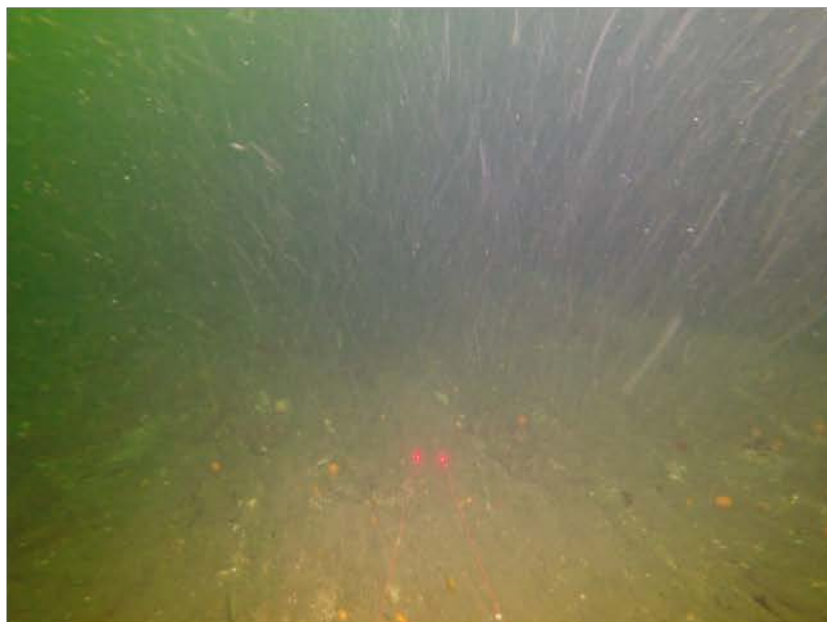
**NO SAMPLE  
RECOVERED**



Sample ID:	CBIW-45	
Date/Time (EST):	10/13/21 10:03	
Depth (real-time, m):	18.8	
Easting (WGS84 UTM Zone 19N, m):	404025.1	66
Northing (WGS84 UTM Zone 19N, m):	4830408	

**Still Image from Video**

**Field Picture**



Laser spacing = 10 cm

**Substrate Type: rock**

**NO SAMPLE  
RECOVERED**



Sample ID:	CBIW-46	
Date/Time (EST):	10/13/21 09:33	
Depth (real-time, m):	21.8	
Easting (WGS84 UTM Zone 19N, m):	407887.5	67
Northing (WGS84 UTM Zone 19N, m):	4831107	

**Still Image from Video**

**Field Picture**



Laser spacing = 10 cm

**Substrate Type: rock**

**NO SAMPLE  
RECOVERED**



Sample ID:	CBIW-47	
Date/Time (EST):	10/13/21 09:49	
Depth (real-time, m):	25.7	
Easting (WGS84 UTM Zone 19N, m):	406184.8	68
Northing (WGS84 UTM Zone 19N, m):	4830910	

Still Image from Video



Laser spacing = 10 cm

**Substrate Type:** muddy gravel (shell hash/pebble mix)

Field Picture



Sample ID:	CBIW-48	
Date/Time (EST):	10/13/21 08:19	
Depth (real-time, m):	19.8	
Easting (WGS84 UTM Zone 19N, m):	407768.4	69
Northing (WGS84 UTM Zone 19N, m):	4836015	



**Still Image from Video**

**Field Picture**



Laser spacing = 10 cm

**Substrate Type:** clayey mud with trace sand



Sample ID:	CBIW-49
Date/Time (EST):	10/13/21 06:57
Depth (real-time, m):	30.8
Easting (WGS84 UTM Zone 19N, m):	408860.7 70
Northing (WGS84 UTM Zone 19N, m):	4836570



**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: gravel**

**Field Picture**



Sample ID:	CBIW-50
Date/Time (EST):	10/07/21 09:15
Depth (real-time, m):	27.7
Easting (WGS84 UTM Zone 19N, m):	415307.1
Northing (WGS84 UTM Zone 19N, m):	4841074

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** muddy gravel with shell hash,  
large cobbles present

**Field Picture**



Sample ID:	CBIW-51	
Date/Time (EST):	10/07/21 10:34	
Depth (real-time, m):	29.9	
Easting (WGS84 UTM Zone 19N, m):	414976.4	72
Northing (WGS84 UTM Zone 19N, m):	4842441	

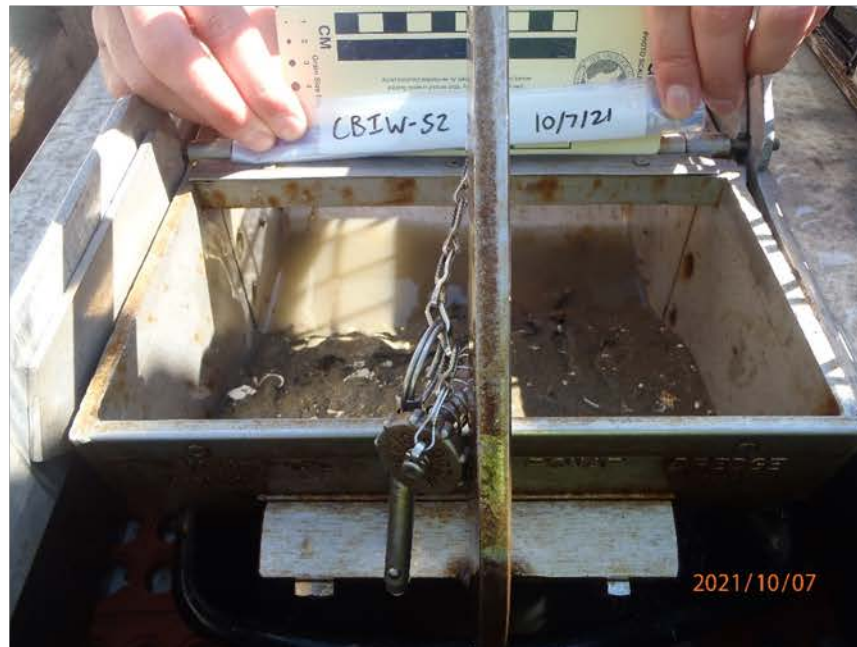
**Still Image from Video**



Laser spacing = 10 cm


**Substrate Type:** medium/coarse grain sand with trace gravel

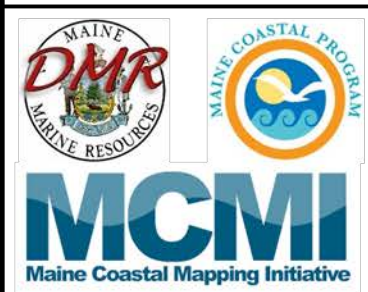
**Field Picture**



Sample ID:	CBIW-52	
Date/Time (EST):	10/07/21 12:11	
Depth (real-time, m):	29.0	
Easting (WGS84 UTM Zone 19N, m):	414068.9	73
Northing (WGS84 UTM Zone 19N, m):	4844495	

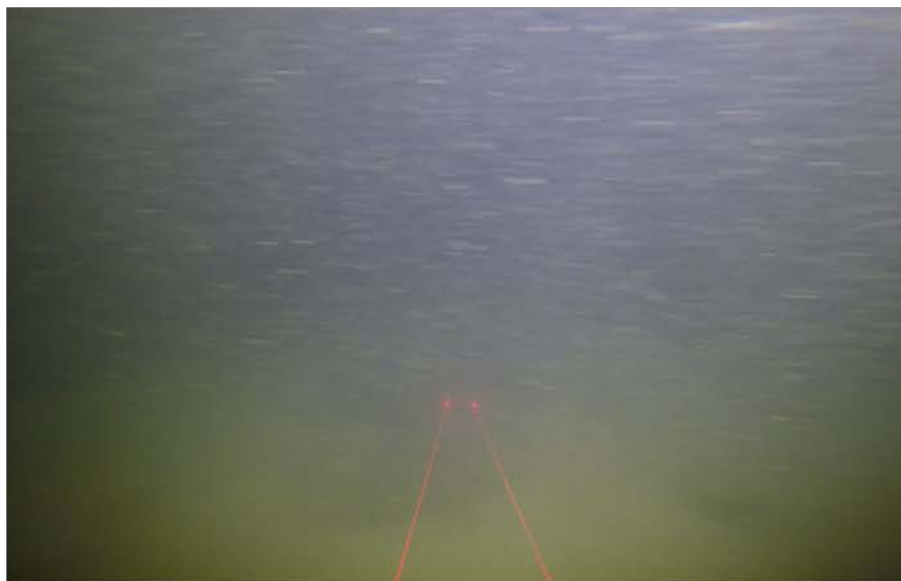


Still Image from Video	Field Picture
 <p data-bbox="879 1105 1079 1130">Laser spacing = 10 cm</p> <p data-bbox="464 1166 840 1206"><b>Substrate Type: rock</b></p>	<p data-bbox="1423 667 1732 764"><b>NO SAMPLE RECOVERED</b></p>



Sample ID:	CBIW-53
Date/Time (EST):	10/19/21 06:58
Depth (real-time, m):	14.0
Easting (WGS84 UTM Zone 19N, m):	407392.4 <span style="float: right;">74</span>
Northing (WGS84 UTM Zone 19N, m):	4834306

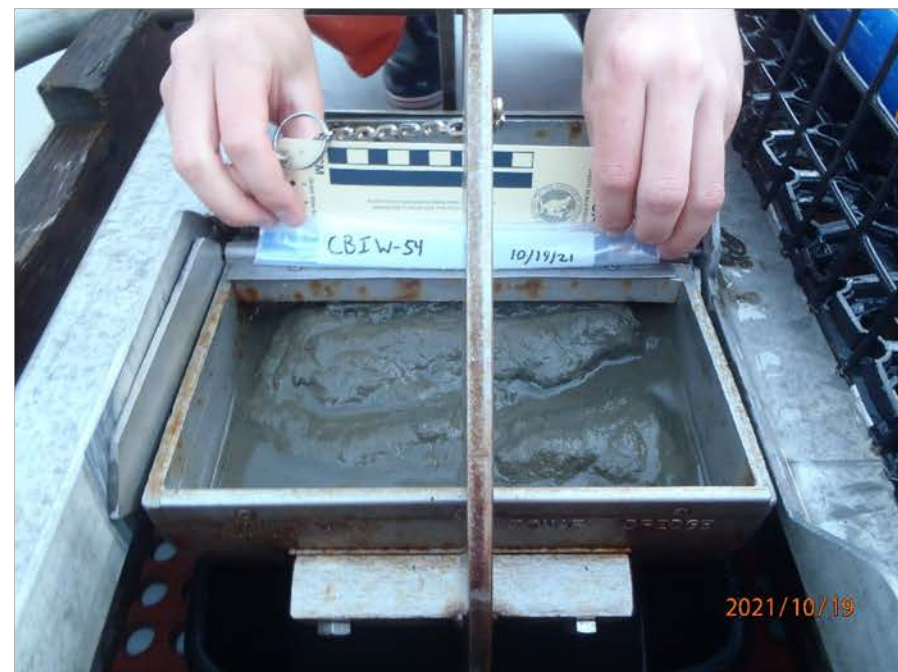
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** silty mud with trace sand

**Field Picture**



Sample ID:	CBIW-54
Date/Time (EST):	10/19/21 07:18
Depth (real-time, m):	22.6
Easting (WGS84 UTM Zone 19N, m):	410021.9 75
Northing (WGS84 UTM Zone 19N, m):	4839078



**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** gravelly sand with shell hash

**Field Picture**



2021/10/19



Sample ID:	CBIW-55	
Date/Time (EST):	10/19/21 08:19	
Depth (real-time, m):	10.3	
Easting (WGS84 UTM Zone 19N, m):	409034.8	76
Northing (WGS84 UTM Zone 19N, m):	4839944	

**Still Image from Video**

**Field Picture**



Laser spacing = 10 cm

**Substrate Type: rock**

**NO SAMPLE  
RECOVERED**



Sample ID:	CBIW-57	
Date/Time (EST):	10/19/21 09:32	
Depth (real-time, m):	11.2	
Easting (WGS84 UTM Zone 19N, m):	411799.7	77
Northing (WGS84 UTM Zone 19N, m):	4843473	

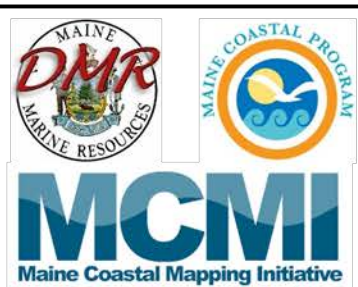
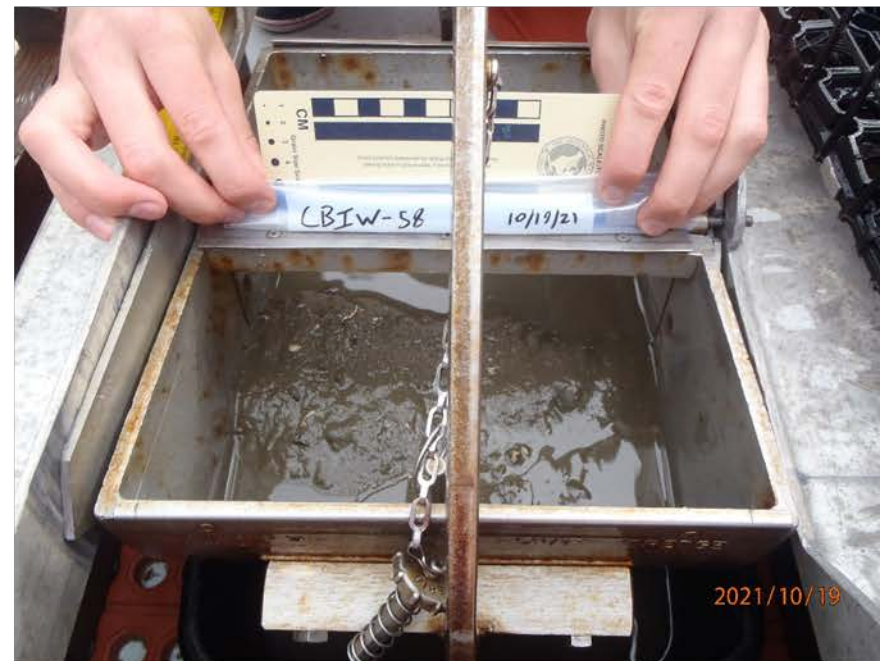
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** sandy mud with shell hash

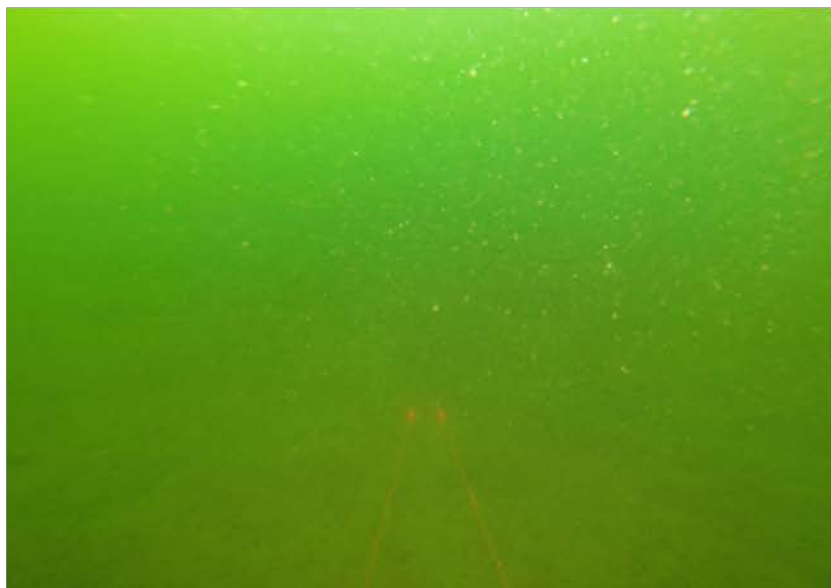
**Field Picture**



Sample ID:	CBIW-58	
Date/Time (EST):	10/19/21 10:00	
Depth (real-time, m):	19.1	
Easting (WGS84 UTM Zone 19N, m):	414011.4	78
Northing (WGS84 UTM Zone 19N, m):	4845542	



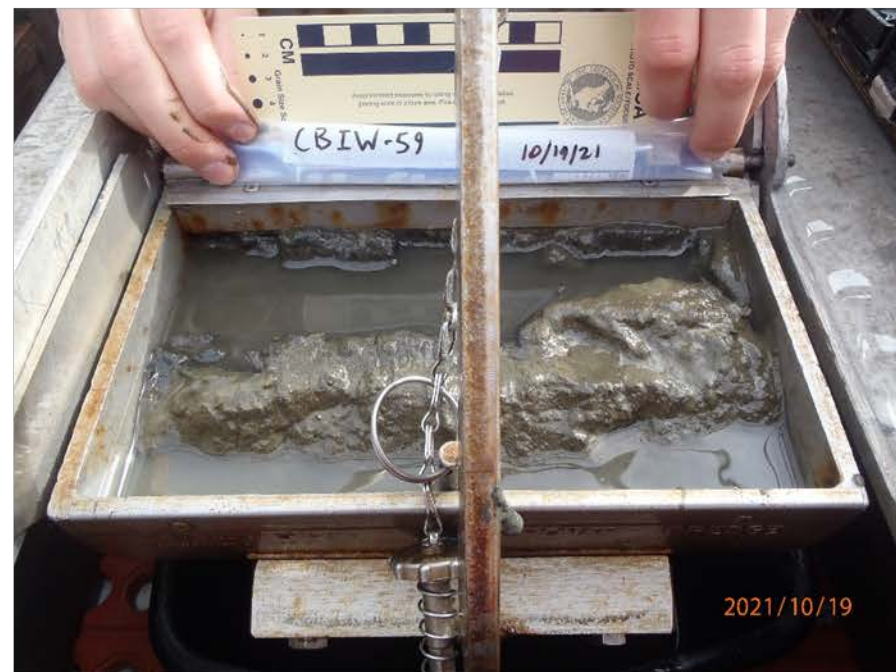
**Still Image from Video**



Laser spacing = 10 cm

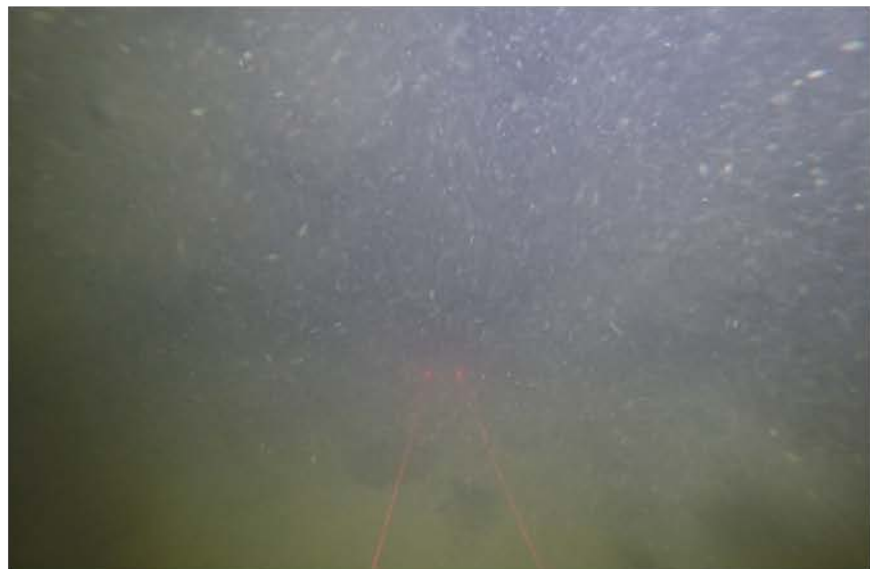
**Substrate Type:** silty mud with trace sand

**Field Picture**



Sample ID:	CBIW-59	
Date/Time (EST):	10/19/21 10:51	
Depth (real-time, m):	8.8	
Easting (WGS84 UTM Zone 19N, m):	409729.3	79
Northing (WGS84 UTM Zone 19N, m):	4845341	

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** silty clayey mud with trace sand

**Field Picture**



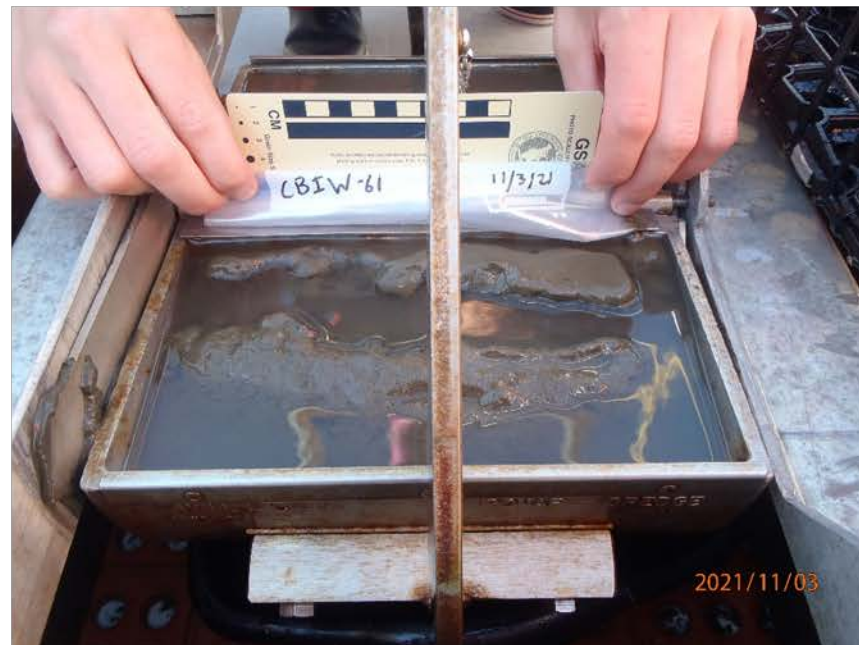
Sample ID:	CBIW-60	
Date/Time (EST):	11/03/21 09:49	
Depth (real-time, m):	13.8	
Easting (WGS84 UTM Zone 19N, m):	408960.0	80
Northing (WGS84 UTM Zone 19N, m):	4844982	



**Still Image from Video**

**Field Picture**

**SEAFLOOR NOT VISIBLE  
IN VIDEO FEED**



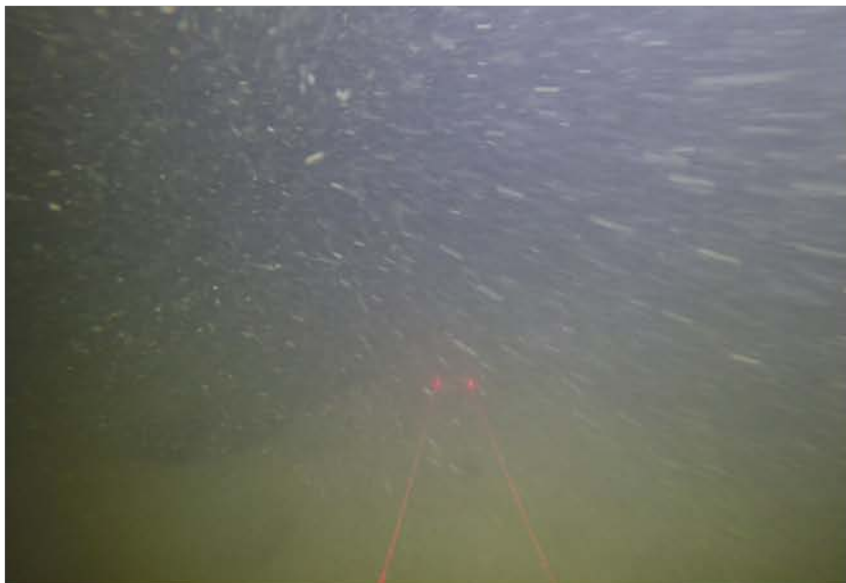
Laser spacing = 10 cm

**Substrate Type:** clayey silty mud with trace sand



Sample ID:	CBIW-61	
Date/Time (EST):	11/03/21 08:41	
Depth (real-time, m):	9.7	
Easting (WGS84 UTM Zone 19N, m):	407977.4	81
Northing (WGS84 UTM Zone 19N, m):	4843900	

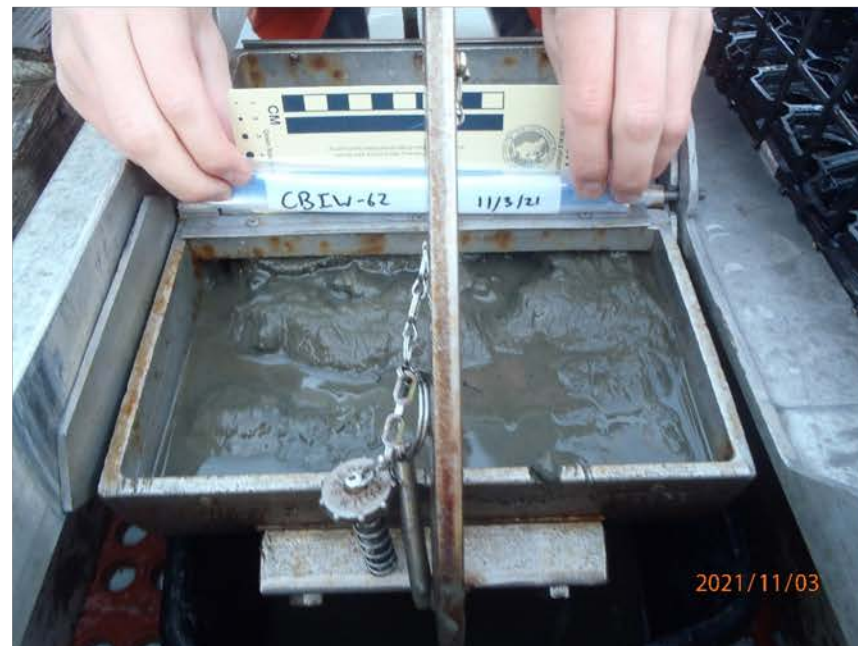
**Still Image from Video**



Laser spacing = 10 cm

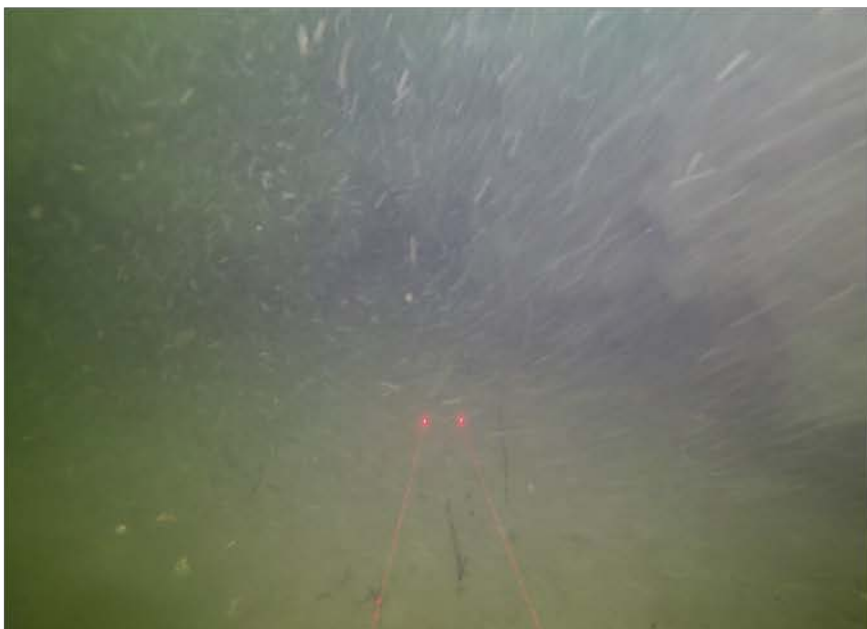
**Substrate Type: silty mud**

**Field Picture**



Sample ID:	CBIW-62	
Date/Time (EST):	11/03/21 07:32	
Depth (real-time, m):	15.3	
Easting (WGS84 UTM Zone 19N, m):	405348.9	82
Northing (WGS84 UTM Zone 19N, m):	4841069	

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** muddy sand with gravel, large cobbles present

**Field Picture**



Sample ID:	CBIW-63	
Date/Time (EST):	11/03/21 11:07	
Depth (real-time, m):	12.7	
Easting (WGS84 UTM Zone 19N, m):	406643.5	83
Northing (WGS84 UTM Zone 19N, m):	4839674	



**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** muddy sand with gravel

**Field Picture**



Sample ID:	CBIW-64	
Date/Time (EST):	11/03/21 12:06	
Depth (real-time, m):	29.0	
Easting (WGS84 UTM Zone 19N, m):	405604.4	84
Northing (WGS84 UTM Zone 19N, m):	4838816	

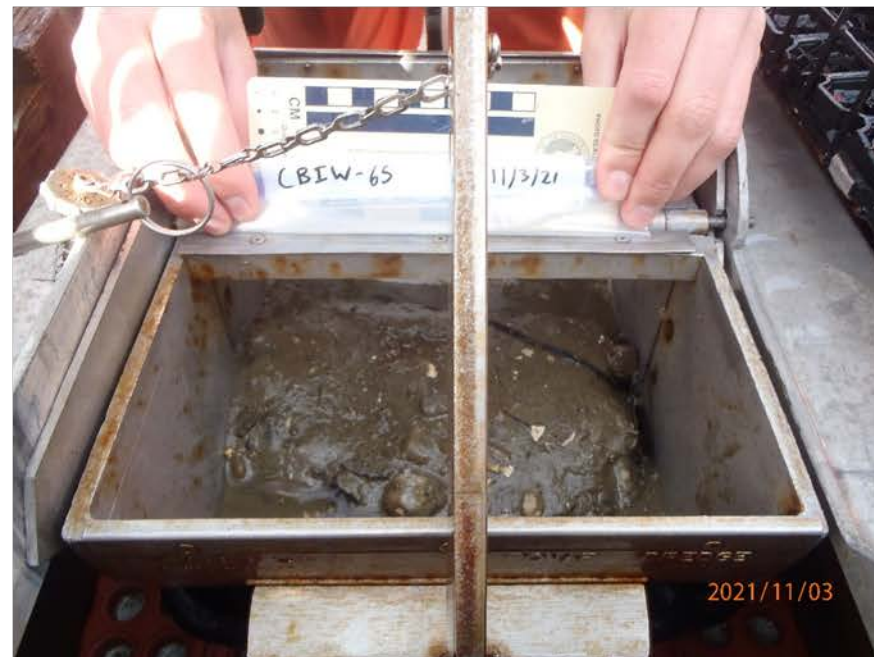
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** muddy sand with gravel

**Field Picture**



Sample ID:	CBIW-65
Date/Time (EST):	11/03/21 13:24
Depth (real-time, m):	26.8
Easting (WGS84 UTM Zone 19N, m):	405493.5 85
Northing (WGS84 UTM Zone 19N, m):	4838681



Still Image from Video

Field Picture

**SEAFLOOR NOT VISIBLE  
IN VIDEO FEED**

Laser spacing = 10 cm

**Substrate Type: fine sand**



Sample ID:	CBIW-66	
Date/Time (EST):	11/09/21 10:23	
Depth (real-time, m):	18.7	
Easting (WGS84 UTM Zone 19N, m):	402963.7	86
Northing (WGS84 UTM Zone 19N, m):	4829680	

**Still Image from Video**

**Field Picture**

**SEAFLOOR NOT VISIBLE  
IN VIDEO FEED**

Laser spacing = 10 cm

**Substrate Type: fine sand**



Sample ID:	CBIW-67	
Date/Time (EST):	11/09/21 08:22	
Depth (real-time, m):	15.3	
Easting (WGS84 UTM Zone 19N, m):	403349.4	87
Northing (WGS84 UTM Zone 19N, m):	4830511	

**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** muddy sand with trace shell hash

**Field Picture**



2021/11/09



Sample ID:	CBIW-68	
Date/Time (EST):	11/09/21 08:49	
Depth (real-time, m):	11.9	
Easting (WGS84 UTM Zone 19N, m):	402310.9	88
Northing (WGS84 UTM Zone 19N, m):	4832220	



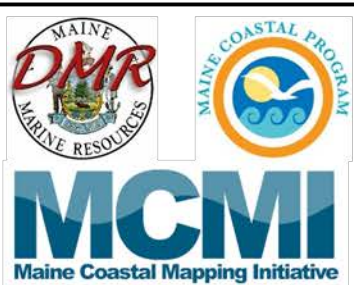
**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type:** sandy gravel with shell hash,  
many large cobbles present

**Field Picture**



Sample ID:	CBIW-69	
Date/Time (EST):	11/09/21 09:53	
Depth (real-time, m):	15.4	
Easting (WGS84 UTM Zone 19N, m):	403568.1	89
Northing (WGS84 UTM Zone 19N, m):	4831959	



**Still Image from Video**



Laser spacing = 10 cm

**Substrate Type: shell hash**

**Field Picture**



Sample ID:	CBIW-70	
Date/Time (EST):	11/09/21 07:11	
Depth (real-time, m):	17.8	
Easting (WGS84 UTM Zone 19N, m):	406289.6	90
Northing (WGS84 UTM Zone 19N, m):	4835746	

**Still Image from Video**

**Field Picture**



Laser spacing = 10 cm

**Substrate Type: rock**

**NO SAMPLE  
RECOVERED**



Sample ID:	CBIW-71	
Date/Time (EST):	11/09/21 08:06	
Depth (real-time, m):	10.3	
Easting (WGS84 UTM Zone 19N, m):	404620.0	91
Northing (WGS84 UTM Zone 19N, m):	4832776	