

LISMaRC Phase II Epifauna Sample Image Locations, Physical Characteristics, and CMECS Designations in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Determined during SEABOSS, ROV, and Wet Diving Operations (2017-18)

METADATA

Dataset Originator: University of New Haven, Christian W. Conroy; University of Connecticut, Peter Auster

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Filename:

LISMaRC_BenthicEcology_2018_EpifaunaSEABOSSROVWetDivingImages_CMECSPhysCharacterization.xlsx

Online Linkage: <http://www.marine-geo.org/portals/lis/>

Abstract: The XLS file includes records of analyzed images collected during USGS SEABed Observation and Sampling System (SEABOSS) and Kraken2 ROV operations in May 2018. Data includes image file names, sample location, date and time, habitat characteristics, identified taxa and biogenic features, taxon and biogenic feature abundance (SEABOSS images only), and measures of diversity. These are the complete records of each sample image.

Dataset purpose: This dataset provides detailed information on the epifaunal communities in the Phase II study area which can be used to map the spatial characteristics of these communities relative to several environmental features to meet the Long Island Sound Cable Fund's goal of ecological characterization of the Long Island Sound sea floor in conjunction with habitat mapping efforts.

Time period of content: These data were collected during May 2018.

Dataset Status: Complete

Update Frequency: None Planned

Theme Keywords: Benthic ecology, Epifauna, diversity, habitat, seafloor imaging, SEABOSS, Kraken2, ROV, Connecticut, New York, Long Island Sound, Fishers Island Sound, estuary, Long Island Sound Mapping and Research Collaborative, LISMaRC

Access Constraints: none

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Users are strongly encouraged to contact the original investigators responsible for data made available on this site. Where appropriate, researchers are also encouraged to consider collaboration and/or co-authorship with original investigators.

Data should not be used for navigation purposes.

Point of Contact: Christian W. Conroy, University of New Haven, cwconroy@newhaven.edu

Dataset Credit: The Long Island Sound Mapping and Research Collaborative (LISMaRC). LISMaRC is the University of Connecticut, the University of New Haven and the US Geological Survey. Funding provided by the Long Island Sound Seafloor Mapping Fund administered cooperatively by the EPA Long Island Sound Study and the Connecticut Department of Energy and Environmental Protection (DEEP).

Data Quality Considerations: see below

Attribute accuracy: All attributes were evaluated during data processing and analysis as standard quality control to ensure attributes contain accurate and relevant information and values.

Completeness: The information provided on epifaunal communities is complete

Positional accuracy:

SEABOSS Horizontal Positional Accuracy: Navigation during both the 2017 and 2018 sample collection periods used Wide Area Augmentation System (WAAS)-enabled GPS. The GPS was set to receive fixes at a 2-second interval in geographic coordinates (World Geodetic System of 1984 [WGS 84]). The recorded position of each sediment sample is the position of the GPS antenna on the survey vessel, located on the aft port side of the R/V Connecticut, not the location of the SEABOSS. The antenna was located approximately 5 meters from the SEABOSS deployment location in fall 2017 and 3 meters in spring 2018. No layback or offset was applied to the recorded position. In addition, the SEABOSS may drift away from the survey vessel when deployed to the sea floor. Based on the various sources of horizontal offsets, a conservative estimate of the horizontal accuracy of the sediment sample locations is 10 meters.

Kraken2 Horizontal Positional Accuracy: The positional accuracy for the support vessel the RV Connecticut's Simrad DGPS is typically 2 meters. The K2 ROV is tracked using an ultra-short baseline tracking system (ORE Trackpoint 2) that relies upon well-mounted transducer on the ship and an acoustic responder mounted on the vehicle. The accuracy of the position of the ROV

is therefore dependent upon additional variables (water depth, ship roll/heave), but generally ranges between 2 to 5 meters.

Wet Diving Horizontal Positional Accuracy: Horizontal Positional Accuracy: Position was recorded manually from the location of the attending research vessel at the commencement of the dive. Both the RV Osprey and RV Zostera use Garmin GPSMAP systems, with reported positional accuracy between 5 and 15 lateral m. This position was then applied to each image and suction sample collected, providing a general location.

Vertical Positional Accuracy: The depths recorded for each sample are approximate and were derived from an unpublished composite bathymetry dataset used by the Long Island Sound Mapping and Research Collaborative project.

Process Steps: Images used for ecological characterization were collected using the United States Geological Survey's (USGS) Seabed Observation and Sampling System (SEABOSS; Valentine et al. 2000; n = 595) collected between May 8 and 15, 2018 (n = 595) and the University of Connecticut's (UConn) Kraken2 (K2) remotely operated vehicle (ROV) between May 19 and 23, 2018 (n = 110) on the RV Connecticut.

SEABOSS: SEABOSS captured orthogonal images of the seafloor. These images were analyzed for percent cover of all living seafloor species (excluding fish) and biogenic features. Percent cover was quantified using a grid of square cells overlaid on each image (n=216 grid cells). Within each grid square, organisms and biogenic features were identified to lowest possible taxonomic level. The sum of these grid cells for each image and organism or biogenic feature is reported in this dataset.

K2: K2 was utilized to acquire imagery in topographically complex and spatially constrained habitats where maneuverability of the camera platform is required to collect adequate image samples. Such areas were difficult to access using SEABOSS. Oblique still images were taken of complex seafloor habitats, vertical surfaces, and boulders and ledges. Due to the complexity of habitats within captured images, determining percent cover using a standardized grid was not possible. Instead, oblique images were analyzed for the presence of all living seafloor species (excluding fish) and biogenic features.

Within-image measures of diversity and richness of taxa and biogenic features were determined per image for the combined SEABOSS and ROV dataset.

Wet Diving: Orthogonal images in depths < 22m were captured during wet diving operations using a quadrat-mounted camera and artificial light, ensuring standardized 0.5m² areas within each image. These images were analyzed for percent cover of all living seafloor species and biogenic features. Percent cover was quantified using a grid of square cells overlaid on each image (n=216 grid cells). Within each grid square, organisms and biogenic features were identified to lowest possible taxonomic level. The sum of these grid cells for each image and organism or biogenic feature is reported in this dataset.

Sediment Samples: Sediment samples were obtained using the USGS SEABOSS system and characterized as described in Ackerman et al. (2020). The CMECS classification system was applied to each sample using both CMECS defined classifiers as well as modified classifiers for

Biotic Groups (see below). Additional information on infaunal communities is provided in two additional classification levels there added, Biotic Community and Other Elements.

Ackerman, S.D., Huntley, E.C., Blackwood, D.S., Babb, I.G., Zajac, R.N., Conroy, C.W., Auster, P.J., Schneeberger, C.L., and Walton, O.L., 2020, Sea-floor sediment and imagery data collected in Long Island Sound, Connecticut and New York, 2017 and 2018: U.S. Geological Survey data release, <https://doi.org/10.5066/P9GK29NM>.

Attributes:

IMAGE: Unique identifier of orthogonal image; SEABOSS imagery formatted as *LISMaRC_Spring2018_IrfColCor_[Date and Time formatted in ISO 8601 standard]*; Kraken imagery formatted as *LISMaRC_Spring2018_ROV_PT_IrfColCor_[Date and Time formatted in ISO 8601 standard]*.

YEAR: Year of image capture; formatted as integer value [2018].

DATE_ISO8601: Date of image capture; formatted in ISO 8601 standard.

TIME_ISO8601: Time of image capture; formatted in ISO 8601 standard.

DATE_TIME_ISO8601: Date and time of image capture; formatted in ISO 8601 standard.

LONGITUDE: see:

https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=disk_b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true

LATITUDE: see:

https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=disk_b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true

SAMPLE_PLATFORM: Sample platform used during image collection.

SAMPLE_AREA: Sample block, site, or area of image capture location.

TRANSECT_ID: SEABOSS sampling transect.

DIVE_ID: Unique identifier of each Kraken2 ROV dive.

ECOG_PATCH: ECognition patch at location of image capture.

PHYS_SET: Physical setting classifier for CMECS.

GEOFORM: Geomorphological classifier for CMECS.

SUBSTRATE: Substrate classifier for CMECS.

BIOTIC_SET: Biotic Setting classifier for CMECS.

BIOTIC_CLA: Biotic Class classifier for CMECS.

BIOTIC_SUB: Biotic Subclass.

BIOTIC_GROUP: General descriptor for the dominant infaunal components of the sample (see below)

GRAIN_SIZE: Sediment classification based on the modified Shepard Classification (1954); described in Ackerman et al. (2020); formatted as text [gravelly sand, gravelly sediment, gravel-sand, sandy silt].

BIOGENIC_DESC: Qualitative description of biogenic features that characterize seafloor habitats; includes notable features.

EPIFAUNA_EMERGENT_DESC: Qualitative description of epi- and emergent fauna and flora that characterize seafloor communities; includes notable taxa.

PHYSICAL_DESC: Qualitative description of physical setting that characterizes seafloor habitats; specific focus on depth, seafloor complexity, and tidal energy.

Detailed Descriptions:

Biotic Groups - CMECS Classification	
Hydroids	Samples dominated by hydroid species that may or may not attached to a hard substrate.
Bryozoans	Samples dominated by abundant or structurally complex, attached bryozoan communities that are may be habitat-forming.
Molluscs	Samples dominated by slow-moving and sessile mollusks, most commonly gastropods.
Sponges	Hard, mixed, or soft substrate areas that are dominated by sponges and their associated communities.
Coral	Samples dominated by non-reef-forming corals.
Benthic Macroalgae	Shallow samples dominated by structure forming attached macroalgae.

Metadata reference: Christian W. Conroy, University of New Haven, cwconroy@newhaven.edu