## Appendix 2-3: Ecological Characterization Metadata

Appendix 2-3-1 - Acoustic patch type and CMECS metadata

Appendix 2-3-2 – Infaunal community characteristics, classification and related environmental data metadata

Appendix 2-3-3 – Infaunal Excel database metadata

Appendix 2-3-4 – Epifauna 2017-2018 SEABOSS, ROV and wet diving and CMECS metadata

Appendix 2-3-5 – Epifaunal 2017 SEABOSS community characteristics, classification and related environmental data metadata

Appendix 2-3-6 – Epifaunal 2018 SEABOSS and ROV community characteristics, classification and related environmental data metadata

Appendix 2-3-7 – Wet diving image metadata

Appendix 2-3-8 – Wet diving suction sample metadata

Appendix 2-3-9 – 2017 SEABOSS diversity metadata

Appendix 2-3-10 – 2018 SEABOSS diversity metadata

Appendix 2-3-11 – 2017-2018 SEABOSS select feature abundance metadata

Appendix 2-3-12 – 2017-2018 SEABOSS Simper cluster metadata

Appendix 2-3-13 – 2017-2018 SEABOSS select taxa metadata

**Acoustic Patch Types and** CMECS **(Coastal and Marine Ecological Classification Standard) Classifications in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound**

**METADATA**

**Dataset Originator**: *University of New Haven; Roman N. Zajac*

**Publication Date**: *6/30/2021*

**Dataset Title:** *Acoustic patch types and CMECS classification in eastern Long Island Sound.*

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

**Abstract:** *This shapefile contains the acoustic patch types determined for the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound, and CMECS (Coastal and Marine Ecological Classification Standard) classification for each patch type. Acoustic patch types were determined by image segmentation of the NOAA backscatter mosaic of the Phase II study area ([https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:167531](https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:167531) using eCognition 9.2 software ([https://geospatial.trimble.com/products-and-solutions/ecognition](https://geospatial.trimble.com/products-and-solutions/ecognition)). Each acoustic patch type has a general sediment classification based on analyses of sediment grain-size data collected by the USGS (see Final Report, Sections 3.0 and 4.0). The acoustic patch types represent general sea floor habitat types and used as the basis for portions of the analyses and characterizations of infaunal and epifaunal ecological structure across the Phase II area.*

*Dataset purpose: This polygon shapefile and dataset provides the spatial distribution of general seafloor types in the Phase II study area which can be used to assess the relationship to the map the spatial characteristics of Infaunal and epifaunal communities to meet the Long Island Sound Cable Fund's goal of habitat and ecological characterization of the eastern Long Island Sound sea floor.*

**Time period of content:** *Analyses leading to the identification and characterization of the acoustic patch types were conducted during 2018 and 2019*

**Dataset Status**: *Complete*

**Update Frequency**: *None Planned*

**Theme Keywords**: *Sea floor habitats, acoustic patch types, Coastal and Marine Ecological Classification Standard, CMECS, Connecticut, New York, Long Island Sound, Fishers Island Sound, estuary, Long Island Sound Mapping and Research Collaborative, LISMaRC*

**Access Constraints**: *none*

**Use Constraints**:

**Point of Contact**: *Roman N. Zajac, University of New Haven, rzajac@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 infaunal communities is complete*

**Positional accuracy**:  *see*

[*https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:167531*](https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:167531) *for details regarding the development the backscatter mosaic by NOAA and the positional accuracy of image features. The patch locations identified by the imagine segmentation are the results of the image segmentation and classification process.*

**Process Steps:**  *The NOAA backscatter image was segmented using the unsupervised routines in eCognition 9.2 software. Segments were then classified and consolidated based on the image pixel attributes (pixel similarity, pixel variance, distance, and other metrics; see Final Report section 4.0) and seeding the analysis with selected segments that were identified based on general backscatter attributes (e.g. darker areas being associated with finer sediments, and lighter areas being associated with coarser sediments). The final sediment classification were based on analyses of USGS sediment data at locations where infaunal samples were collected*

*that fell withing specific acoustic patch types. The CMECS classifications are based on the general attributes found in each acoustic patch type based on analyses of environmental data (sediment composition, depth, bed stress) and results from analyses of Infaunal and epifaunal communities, as well as other attributes in photographic images (e.g., surficial features such as shell hash).*

**Attributes:**

*FIELD_NO: Sediment sample designation*

*LONGITUDE: see*
*[https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true](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](https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true)*

*FID: ArcGIS Polygon identifier*

*Area: Area of Polygon*

*Perimeter: Perimeter of Polygon*

*Acoutic_Pa: Acoustic Patch Type designation*

*Physical_S: Physical Setting; Physical setting classifier based on CMECS*

*Geoform: Geomorphological classifier based on CMECS*

*Substrate: General acoustic patch type sediment classification plus addition of shell*

*Physical_1: General physical conditions in each acoustic patch type based on depth, terrain ruggedness, and seafloor bed stress*

*Biogenic_S: Biogenic Setting; General biogenic substrate characteristics in each of the acoustic patch types*

*Biotic_Set: Biotic Setting; biotic setting classifier based on CMECS modified for both infaunal and epifaunal components*

*Biotic_Cla: Biotic Class; biotic class designation based on CMECS modified for both infaunal and epifaunal components as well as variability among acoustic patch types*

*Biotic_Sub: Biotic Subclass; general biotic subclass classifier based on CMECS modified for both Infaunal and epifaunal components*

*Biotic_Gro: Biotic Group Epifauna; general types of epifauna found in specific acoustic patch types*

*Epi_and_Em: Epi- and Emergent Fauna Notes;  dominant epifauna found in specific acoustic patch types and their relative abundances, with notes and seasonal occurrences as appropriate*

*Biotic_G_1: Biotic Group Infauna; general types of infauna found in specific acoustic patch types*

*Infauna_No: Infauna Notes; dominant infauna found in specific acoustic patch types with identification of rarer species that may have ecological significance*

**Metadata reference**:  *Roman N. Zajac, University of New Haven, [rzajac@newhaven.edu](mailto:rzajac@newhaven.edu),  Chris Conroy, University of Connecticut/University of New Haven, [cwconroy@newhaven.edu](mailto:cwconroy@newhaven.edu), Peter Auster, University of Connecticut, [peter.auster@uconn.edu](mailto:peter.auster@uconn.edu)*

**Infaunal Community Characteristics, Classification and Related Environmental Data in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound**

**METADATA**

**Dataset Originator**: *University of New Haven; Roman N. Zajac*

**Publication Date**:  *6/30/2021*

**Dataset Title:** *Community characteristics, classification and related environmental data at infaunal sample sites in eastern Long Island Sound.*

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

**Abstract:** *This shapefile contains derived infaunal community characteristics (total abundance, taxonomic richness, diversity, community type), CMECS (Coastal and Marine Ecological Classification Standard) classification and related environmental data for each infaunal sample site in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound. The data were collected using the USGS SEABOSS system on the Research Vessel Connecticut (University of Connecticut) in November/December 2017 and May 2018.*

*Dataset purpose: This dataset provides detailed information on the infaunal 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 over a 10 day spans in November / December 2017 and May 2018*

**Dataset Status**: *Complete*

**Update Frequency**: *None Planned*

**Theme Keywords**:  *Benthic ecology, Infauna, Sea floor communities, Coastal and Marine Ecological Classification Standard, CMECS, Connecticut, New York, Long Island Sound, Fishers Island Sound, estuary, Long Island Sound Mapping and Research Collaborative, LISMaRC*

**Access Constraints**: *none*

**Use Constraints**:

*Data and metadata are licensed under a* Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. *Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should*

*be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.*

*Data are provided with the express understanding that they will not be sold to third parties or included in commercial databases.*

*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**: *Roman N. Zajac, University of New Haven, rzajac@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 infaunal communities is complete*

**Positional accuracy**:

*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.*

*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:** *Sediment samples were obtained using the USGS SEABOSS system were washed on a 1 mm sieve using filtered seawater and preserved in 70% ethanol. Several samples were*

*washed on a 0.5 mm sieve. Samples were sorted using a dissecting microscope and all individuals identified to the lowest taxonomic level possible. For each sample the total abundance and taxonomic richness was calculated, as well sample diversity using the Shannon diversity index H'. The entire data set was analyzed using a variety of multivariate statistical approaches to assess and identify community types. 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.*

**Attributes:**

*FIELD_NO: Sediment sample designation*

*LONGITUDE: see*
*[https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true](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](https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true)*

*DEPTH_M: Approximate depth of water in meters at the sample location derived from an unpublished composite bathymetry dataset used by the Long Island Sound Mapping and Research Collaborative project.*

*GRAVEL_PCT: Gravel content in percent dry weight of the sample. Gravel consists of particles with nominal diameters greater than 2 mm (-1 phi and larger).*

*SAND_PCT: Sand content in percent dry weight of the sample. Sand consists of particles with nominal diameters less than 2 mm, but greater than or equal to 0.0625 mm (0 phi through 4 phi, inclusive).*

*SILT_PCT: Silt content in percent dry weight of the sample. Silt consists of particles with nominal diameters less than 0.0625 mm, but greater than or equal to 0.004 mm (5 phi through 8 phi, inclusive).*

*CLAY_PCT: Clay content in percent dry weight of the sample. Clay consists of particles with nominal diameters less than 0.004 mm (9 phi and smaller).*

*USGS_Class: USGS sediment classification; see*
*[https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true](https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true)*

*Tidal_Max: Maximum tidal shear stress at sediment surface in pascals (a pressure of one newton per square meter, or, in SI base units, one kilogram per meter per second squared)*

*Tidal_Mean: Mean tidal shear stress at sediment surface in pascals (a pressure of one newton per square meter, or, in SI base units, one kilogram per meter per second squared)*

*Depth_neg:  depth expressed as negative value*

*TRI_Pixel1: Terrain Roughness Index, values closer to 0 indicate flatter terrain (seafloor), higher values indicate increasingly variable or irregular elevation (highs and lows) within a sampled unit of seafloor.*

*PHI_11: Phi 11: colloid;  percent by weight of sediment grain-sizes in this category of the Phi scale (the phi scale is a sediment particle size scale, defined as a logarithmic transformation of the geometric Udden-Wentworth grain size scale, the higher the phi value, the finer the particle size) for details see:*

*https://www.sciencebase.gov/catalog/file/get/5de9be03e4b02caea0eeda45?f=__disk__b1%2Fe4%2F74%2Fb1e47494caa95e6a54c32f270518094926f78286&transform=1&allowOpen=true*

*PHI_10: Phi 10, clay*

*PHI_9: Phi 9, clay*

*PHI_8: Phi 8, silt*

*PHI_7: Phi 7, silt*

*PHI_6: Phi 6, silt*

*PHI_5: Phi 5, silt*

*PHI_4: Phi 4, silt / very fine sand*

*PHI_3: Phi 3, very fine sand / fine sand*

*PHI_2: Phi 2, fine sand / medium sand*

*PHI_1: Phi 1, medium sand/ coarse sand*

*PHI_0: Phi 0, very coarse sand*

*PHI__1: Phi negative 1, very fine gravel*

*PHI__2: Phi negative 2, very fine gravel / fine gravel*

*PHI__3: Phi negative 3, medium gravel*

*PHI__4: Phi negative 4, medium gravel / coarse gravel*

*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)*

*Biotic_Community: Numerically dominant taxa found in the sample*

*Other_Elements: Taxa found in the sample that may have important ecological roles within the community and/or interesting features*

*Acoustic_Patch_Type: Patch types identified from multi-segmentation image analysis of the backscatter mosaic of the Phase II study area*

*Acoustic_Patch_Type_Classification: General sediment type classification of the Acoustic Patches*

*Season: Season in which the sample was collected, fall = late November early December 2017; spring= May 2018*

*S: Taxonomic Richness; the total number of taxa found in the sample*

*N: Total Abundance; the total number of individuals of all taxa found in the sample*

*H_log10: Shannon Diversity H'; calculated using log base 10, higher values indicate higher diversity as a combination of taxonomic richness and relative abundances of the taxa in the sample*

*Comm_Desig: Community Designation; infaunal communities identified in multivariate analyses of the data, see below for general community descriptions*

*ENV_Long_Q: the sample sites divided by quartiles of longitude in Phase II study area*

## DETAILED DESCRIPTIONS:

| Biotic Groups - CMECS Classification | |
|---|---|
| *Clam Bed* | *Sample dominated by bivalves* |
| *Clam Bed / Burrowing Fauna* | *Sample dominated by bivalves and burrowing fauna, generally polychaetes* |
| *Clam Bed / Small Tube Building Fauna* | *Sample dominated by bivalves and small tube builders, generally spionid polychaetes* |
| *Clam Bed / Tube Building and Burrowing Fauna* | *Sample dominated by bivalves with tube building and burrowing polychaetes of varied sizes* |

| | |
|---|---|
| *Faunal Bed* | *No evident dominant taxa* |
| *Large Tube Building Fauna* | *Mostly large tube building fauna such as bamboo worms* |
| *Mollusc Bed* | *Sample dominated by both bivalves and other molluscs* |
| *Mollusc Bed / Burrowing Fauna* | *Sample dominated by both bivalves and other mollucs and burrowing polychaetes* |
| *Mollusc Bed / Burrowing Fauna /Motile Fauna* | *as above but with surface motile taxa* |
| *Mollusc Bed / Tube Building and Burrowing Fauna* | *Sample dominated by bivalves and other molluscs with tube building and burrowing polychaetes of varied sizes* |
| *Mollusc Bed / Tube Building Fauna* | *Sample dominated by bivalves and other molluscs with tube building polychaetes* |
| *Motile Crustaceans* | *Sample dominated by surficial motile crustaceans* |
| *Motile Gastropods and Crustacea* | *Sample dominated by gastropods and crustaceans* |
| *Motile Surface Fauna* | *sample with surface motile fauna but no dominant taxa* |
| *Ophiuroids / Clam Bed* | *Brittle stars and bivalves* |
| *Sand Dollar Bed* | *Sample with large numbers of sand dollars* |
| *Sessile and Mobile Molluscs* | *Sample with gastropods and mix of sessile molluscs* |
| *Small  & Large Tube Building Fauna* | *Sample dominated by large and small builders such as spionids and bamboo worms* |
| *Small Surface-Burrowing Fauna* | *Sample dominated by small polychaetes usually living just below the surface of the sediment* |
| *Small Tube Building Fauna* | *Sample dominated by tube building polychaete such as spionids* |
| *Tube Building Fauna* | *Sample dominated by  a variety of tube building polychaetes* |
| *Tube Building and Burrowing Fauna* | *Sample dominated by a variety of tube building and burrowing fauna* |
| *Tube Building and Burrowing Fauna / Clam Bed* | *Sample dominated by a variety of tube building and burrowing fauna and bivalves* |
| *Tube Building and Burrowing Fauna / Mollusc Bed* | *Sample dominated by a variety of tube building and burrowing fauna and molluscs* |

### Community Designation

| Community Type | Taxa making up ~ 70% of the total distinctness of the community (see Final Report for details; see Phase II Infauna Master.xlsx for full taxonomic identifications) |
|---|---|
| a | *Mulinia lateralis, Nucula proxima, Asychis elongatus, Anadara transversa* |
| b | *Astarte spp., Anadara transversa* |
| c | *Astarte spp., Glycera capitata, Echinarachnius parma, Paraonis fulgens, Astarte castaneum* |
| d | *Marenzallaria viridis, Nephtys picta, Corophium spp., Spiophanes bombyx, Mediomastus ambiseta, Protohaustorius wigleyi, Praxillella praetermissa, Sabellaria vulgaris, Magelona papilliformis, Tellina agilis, Chiridotea tuftsii* |
| e | *Crepidula fornicata, Pista cristata, Arabella irricolor, Astyris lunant, Diastylis ratheki* |
| f | *Corophium spp., Crepidula fornicata, Nicomache lumbricalis, Praxillella praetermissa. Ceriantheopsis americanus, Cirratulus cirratus* |
| g | *Crepidula fornicata, Astyris lunata, Crepidula plana, Corophium spp., Anadara transversa, Astarte spp., Pyramidellidae Family, Lepidonotus squamatus, Pagurus longicarpus* |
| h | *Astarte spp., Corophium spp., Mytilus edulis, Praxillella praetermissa, Spiophanes bombyx, Ampharete arctica, Pagurus longicarpus, Lepidonotus squamatus, Nicomache lumbricalis* |
| i | *Corophium spp., Astarte spp., Mediomastus ambiseta, Pagurus longicarpus, Arabella iricolor, Tharyx acutus, Lyonsia hyalina, Nucula spp, Scalibregma inflatum, Anadara transversa, Asychis elongatus, Spiochaetopterus costarum oculatus, Nephtys picta, Astarte undata, Amphipholis squamata, Nicomache lumbricalis, Spiophanes bombyx, Syllidae, Amphipholis abditis* |
| j | *Astarte spp., Ampharete arctica, Harmothoe imbricata, Corophium spp., Glycera capitata, Spiophanes bombyx, Pagurus longicarpus, Anadara transversa, Nicomache lumbricalis, Mediomastus ambiseta, Cirratulus cirratus, Marenzallaria viridis, Marphysa sanguinea, Praxillella praetermissa, Paraonis fulgens, Glycera dibranchiata, Mytilus edulis, Mulinia lateralis, Astarte undata* |
| k | *Astarte spp., Corophium spp., Glycera capitata, Mediomastus ambiseta, Spiophanes bombyx, Paraonis fulgens, Tharyx acutus, Anadara transversa, Syllidae, Astyris lunata, Cirratulus cirratus, Praxillella praetermissa, Crepidula fornicata, Ampelisca vadorum, Pagurus longicarpus* |

| l | *Ampelisca vadorum, Praxillella praetermissa, Spiophanes bombyx, Pagurus longicarpus, Corophium spp., Arabella iricolor, Spiochaetopterus costarum oculatus, Nephtys incisa, Nicomache lumbricalis, Mediomastus ambiseta, Scalibregma inflatum, Clymenella torquata, Nephtys picta* |
|---|---|
| m | *Phoxocephalus holbolli, Nephtys picta, Pagurus longicarpus, Tellina agilis, Paraonis fulgens, Glycera capitata, Ilyanassa trivittata* |

**Metadata reference**:  *Roman N. Zajac, University of New Haven, [rzajac@newhaven.edu](mailto:rzajac@newhaven.edu)*

**Infaunal Community Database for the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound**

**METADATA**

**Dataset Originator**: *University of New Haven; Roman N. Zajac*

**Publication Date**:  *6/30/2021*

**Dataset Title:** *Community composition and abundance at infaunal sample sites in eastern Long Island Sound.*

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

**Abstract:** *This Excel file contains data for taxa and their abundance at for each infaunal sample site in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound. The data were collected using the USGS SEABOSS system on the Research Vessel Connecticut (University of Connecticut) in November/December 2017 and May 2018.*

*Dataset purpose: This dataset provides the data for the composition and abundance of all infaunal taxa in the Phase II study area which formed the basis of analyzing infaunal community characteristics relative to environmental features and the distribution of patch types in the Phase II study area   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 over a 10-day spans in November / December 2017 and May 2018*

**Dataset Status**: *Complete*

**Update Frequency**: *None Planned*

**Theme Keywords**:  *Benthic ecology, Infauna, Sea floor communities, Coastal and Marine Ecological Classification Standard, CMECS, Connecticut, New York, Long Island Sound, Fishers Island Sound, estuary, Long Island Sound Mapping and Research Collaborative, LISMaRC*

**Access Constraints**: *none*

**Use Constraints**:

*Data and metadata are licensed under a* [Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License](). *Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.*

*Data are provided with the express understanding that they will not be sold to third parties or included in commercial databases.*

*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**: *Roman N. Zajac, University of New Haven, rzajac@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 infaunal communities is complete*

**Positional accuracy**: Doeas not appy but positions of all samples can be obtained in the associated shapefiles

**Process Steps:** *Sediment samples were obtained using the USGS SEABOSS system were washed on a 1 mm sieve using filtered seawater and preserved in 70% ethanol. Samples were sorted using a dissecting microscope and all individuals identified to the lowest taxonomic level possible. All taxonomy was verified using the World Register of Marine Species (WoRMS) http://www.marinespecies.org/index.php )*

 **Attributes:**

Top Row: Provides sampling station identifiers for sampling stations in columns

Subsequent rows: Provide the number of individuals of any specific taxon found in the sample; sample area was 0.1 m$^2$

First four columns provide the name of the taxon, and its Phylum, Class, and Family

**Metadata reference**: *Roman N. Zajac, University of New Haven, rzajac@newhaven.edu*

**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

**Publication Date**:  6/30/2021

**Dataset Title:** 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)

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

**Use Constraints**: Data and metadata are licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to

their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.

Data are provided with the express understanding that they will not be sold to third parties or included in commercial databases.

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 0.5m$^2$ 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

**LISMaRC Phase II Epifauna Sample Image Locations, Environmental Characteristics, Taxa and Biogenic Feature Cover, and Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2017)**

**METADATA**

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

**Publication Date**:  6/30/2021

**Dataset Title:** LISMaRC Phase II Epifauna Sample Image Locations, Environmental Characteristics, Taxa and Biogenic Feature Cover, and Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2017)

Filename: *LISMaRC_BenthicEcology_2017_EpifaunaSeaBossImages_EcolCharacterization.xlsx*

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

**Abstract:** The XLS file includes record of analyzed images collected during USGS SEABed Observation and Sampling System (SEABOSS) operations in November and December 2017. Data includes image file names, sample location, date and time, habitat characteristics, identified taxa and biogenic features, taxon and biogenic feature abundance, 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 November and December 2018.

**Dataset Status**: Complete

**Update Frequency**: None Planned

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

**Access Constraints**: none

**Use Constraints**: Data and metadata are licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org). Where citation information has been provided to us by scientists it is included with the relevant

database entries, and should be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.

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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**:

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.

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 (n=602) were using the United States Geological Survey's (USGS) Seabed Observation and Sampling System (SEABOSS;

Valentine et al. 2000) collected between November 28 and December 3, 2017 on the RV Connecticut.

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. Within-image measures of diversity and richness of taxa and biogenic features were determined per image.

Additional abiotic factors included in the dataset are depth (from multibeam bathymetry), topographic roughness index (TRI; derived from variation in bathymetry based on a moving window of surrounding each cell), tau max (value from the model of seafloor stress), and longitude and the corresponding quartiles for each of these factors.

**Attributes:**

IMAGE:  Unique identifier of orthogonal image; formatted as *LISMaRC_Fall2017_DSC_IrfColCor_[Image File Name Assigned by Camera]*.

YEAR:  Year of image capture; formatted as integer value [2017].

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_AREA:  Sample block or site of image capture location.

ECOG_PATCH:  ECognition patch at location of image capture.

DEPTH_m:  Approximate depth of water in meters at the location of image capture derived from an unpublished composite bathymetry dataset used by the Long Island Sound Mapping and Research Collaborative project; measured in m.

DEPTH_Q4:  Depth quartile at the location of image capture; depth increases with increasing quartile.

TRI_4m:  Topographic roughness index (TRI) derived from depth.

TRI4m_Q4:  TRI quartile at the location of image capture; TRI increases with increasing quartile.

TAU_MX:  Maximum tidal shear stress at sediment surface in pascals (a pressure of one newton per square meter, or, in SI base units, one kilogram per meter per second squared).

TAUMX_Q4:  Maximum tau quartile at the location of image capture; maximum tau increases with increasing quartile.

LONG_Q4:  Longitude quartile at the location of image capture; longitude decreases with increasing quartile.

BACKSCATTER:  Backscatter intensity at the location of image capture derived from an unpublished composite backscatter dataset used by the Long Island Sound Mapping and Research Collaborative project.

BACKSCAT_FOCALMN:  Mean backscatter intensity of a 9-pixel square centered at the location of image capture.

BACKSCAT_FOCALCV:  Coefficient of variation (CV) of backscatter intensity of a 9-pixel square centered at the location of image capture.

S_TAXA_FEAT:  Combined taxa and biogenic feature richness (S).

J_TAXA_FEAT:  Combined taxa and biogenic feature evenness (J').

Hlog10_TAXA_FEAT:  Combined taxa and biogenic feature Shannon-Weiner diversity index (H' $\log_{10}$).

S_TAXA:  Taxa richness (S).

J_TAXA:  Taxa evenness (J').

Hlog10_TAXA:  Taxa Shannon-Weiner diversity index (H' $\log_{10}$).

S_FEAT:  Biogenic feature richness (S).

Identified Taxa and Biogenic Features (individually listed in dataset):  Organisms identified to lowest possible taxonomic level and biogenic features; grid cells containing each taxa and features in each SEABOSS image were summed and reported as number of grid cells [0-216] formatted as integer values.

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

**LISMaRC Phase II Epifauna Sample Image Locations, Environmental Characteristics, Taxa and Biogenic Feature Abundances, and Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound during SEABOSS and ROV Operations (2018)**

**METADATA**

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

**Publication Date**:  6/30/2021

**Dataset Title:** LISMaRC Phase II Epifauna Sample Image Locations, Environmental Characteristics, Taxa and Biogenic Feature Abundances, and Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound during SEABOSS and ROV Operations (2018)

Filename: LISMaRC_BenthicEcology_2018_EpifaunaSEABOSSROVImages_EcolCharacterization.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 seafloor 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

**Use Constraints**: Data and metadata are licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org).

Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.

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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.

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.

Additional abiotic factors included in the dataset are depth (from multibeam bathymetry), topographic roughness index (TRI; derived from variation in bathymetry based on a moving window of surrounding each cell), tau max (value from the model of seafloor stress), and longitude and the corresponding quartiles for each of these factors.

**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.

DEPTH_m: Approximate depth of water in meters at the location of image capture derived from an unpublished composite bathymetry dataset used by the Long Island Sound Mapping and Research Collaborative project; measured in m.

DEPTH_Q4: Depth quartile at the location of image capture; depth increases with increasing quartile.

TRI_4m: Topographic roughness index (TRI) derived from depth.

TRI4m_Q4: TRI quartile at the location of image capture; TRI increases with increasing quartile.

TAU_MX: Maximum tidal shear stress at sediment surface in pascals (a pressure of one newton per square meter, or, in SI base units, one kilogram per meter per second squared).

TAUMX_Q4: Maximum tau quartile at the location of image capture; maximum tau increases with increasing quartile.

LONG_Q4: Longitude quartile at the location of image capture; longitude decreases with increasing quartile.

BACKSCATTER: Backscatter intensity at the location of image capture derived from an unpublished composite backscatter dataset used by the Long Island Sound Mapping and Research Collaborative project.

BACKSCAT_FOCALMN: Mean backscatter intensity of a 9-pixel square centered at the location of image capture.

BACKSCAT_FOCALCV: Coefficient of variation (CV) of backscatter intensity of a 9-pixel square centered at the location of image capture.

S_TAXA_FEAT: Combined taxa and biogenic feature richness (S).

J_TAXA_FEAT:  Combined taxa and biogenic feature evenness (J').

Hlog10_TAXA_FEAT:  Combined taxa and biogenic feature Shannon-Weiner diversity index (H' $\log_{10}$).

S_TAXA:  Taxa richness (S).

J_TAXA:  Taxa evenness (J').

Hlog10_TAXA:  Taxa Shannon-Weiner diversity index (H' $\log_{10}$).

S_FEAT:  Biogenic feature richness (S).

Identified Taxa and Biogenic Features (individually listed in dataset):  Organisms identified to lowest possible taxonomic level and biogenic features; grid cells containing each taxa and features in each SEABOSS image were summed and reported as number of grid cells [0-216] formatted as integer values; taxa and features in each K2 image were reported as present [1] or absent [2] formatted as integer values.

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

**LISMaRC Phase II Epifauna Shallow Sample Image Locations, Environmental Characteristics, and Taxa and Biogenic Feature Cover in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during Wet Diving Operations (2017-18)**

**METADATA**

**Dataset Originator**:  LISMaRC

**Publication Date**:  6/30/2021

**Dataset Title:** LISMaRC Phase II Epifauna Shallow Sample Image Locations, Environmental Characteristics, and Taxa and Biogenic Feature Cover in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during Wet Diving Operations (2017-18)

**Filename:**  Filename:
*LISMaRC_BenthicEcology_2017_18_EpifaunaWetDivingImages_EcolCharacterization.xlsx*

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

**Abstract:** The XLS file includes record of analyzed suction samples collected during wet diving operations during 2017 and 2018. Data includes sample location, date, taxa and abundance of collected organisms, and file names of the orthogonal images associated with the specific samples. These are the complete records of each analyzed suction sample.

**Dataset purpose:** This data was used to assess the efficacy of using orthogonal imagery to characterize benthic emergent and epifauna.

**Time period of content:** Samples were collected between August 2017 and August 2018 during 1-day trips to wet diving sample locations. RV Osprey and RV Zostera were used during these sample trips.

**Dataset Status**: complete

**Update Frequency**: none planned

**Theme Keywords**:  Eastern Long Island Sound, Phase II Area, wet diving, suction samples, epifauna, emergent fauna, algae, seafloor habitat, University of Connecticut, UConn

**Access Constraints**: none

**Use Constraints**:  Data and metadata are is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link **must** be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org) and/or the Long Island Sound Habitat Mapping website (https://lismap.uconn.edu). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may

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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**:  Data reports cover as number of grid cells (out of 216 total) of organisms collected from the surface of a 0.5 m$^2$ area of seafloor. Collected samples were analyzed in full and accurately represent the organisms at that location.

**Completeness**: Each sample record reports the complete results of analysis, sample location, sample date, and orthogonal images associated with the suction samples.

**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:**  Orthogonal images in depths < 22m were captured during wet diving operations using a quadrat-mounted camera and artificial light, ensuring standardized 0.5m$^2$ 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.

Additional abiotic factors included in the dataset are depth (from multibeam bathymetry), topographic roughness index (TRI; derived from variation in bathymetry based on a moving window of surrounding each cell), tau max (value from the model of seafloor stress), and longitude and the corresponding quartiles for each of these factors.

**Attributes:**

IMAGE:  Unique identifier of orthogonal image; formatted as *UCONN_IrfColCor_[Research Vessel]Date (ISO 8601)]_[Sample Site ID]_[Camera Model]_[Sequential Image Number; unique to dive]_[Image File Name Assigned by Camera]*.

YEAR:  Year of image capture; formatted as integer value [2017-2018].

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

LONGITUDE:  Longitude of sample site; formatted in decimal degrees; World Geodetic System 1984 datum.

LATITUDE:  Latitude of sample site; formatted in decimal degrees; World Geodetic System 1984 datum.

SAMPLE_AREA:  Sample block or site of image capture location.

NEAR_SAMPLE_AREA: Sample blocks or sites nearest image capture location.

DIVE_SITE_ID:  Unique Identifier of image capture location [SD01-SD12].

DIVE_SITE:  Text identifier of image capture location.

ECOG_PATCH:  ECognition patch at location of image capture.

DEPTH_m:  Approximate depth of water in meters at the location of image capture derived from an unpublished composite bathymetry dataset used by the Long Island Sound Mapping and Research Collaborative project; measured in m.

DEPTH_Q4:  Depth quartile at the location of image capture; depth increases with increasing quartile.

TRI_4m:  Topographic roughness index (TRI) derived from depth.

TRI4m_Q4:  TRI quartile at the location of image capture; TRI increases with increasing quartile.

TAU_MX:  Maximum tidal shear stress at sediment surface in pascals (a pressure of one newton per square meter, or, in SI base units, one kilogram per meter per second squared).

TAUMX_Q4:  Maximum tau quartile at the location of image capture; maximum tau increases with increasing quartile.

LONG_Q4:  Longitude quartile at the location of image capture; longitude decreases with increasing quartile.

Identified Taxa and Biogenic Features (individually listed in dataset):  Organisms identified to lowest possible taxonomic level and biogenic features; grid cells containing each taxa and features in each image were summed and reported as number of grid cells [0-216] formatted as integer values.

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

**LISMaRC Phase II Epifauna Shallow Suction Sample Locations and Taxa and Biogenic Feature Abundance in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during Wet Diving Operations (2017-18)**

**METADATA**

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

**Publication Date**:  September 2019

**Dataset Title:** LISMaRC Phase II Epifauna Shallow Suction Sample Locations and Taxa and Biogenic Feature Abundance in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during Wet Diving Operations (2017-18)

Filename: *LISMaRC_BenthicEcology_2017_18_EpifaunaWetDivingSuctionSamples_EcolCharacterization .xlsx*

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

**Abstract:** The XLS file includes record of analyzed suction samples collected during wet diving operations during 2017 and 2018. Data includes sample location, date, taxa, and abundance of collected organisms, and file names of the orthogonal images associated with the specific samples. These are the complete records of each analyzed suction sample.

**Dataset purpose:** This data was used to assess the efficacy of using orthogonal imagery to characterize benthic emergent and epifauna.

**Time period of content:** *{cruise or sampling dates/ranges with month & year}* Samples were collected between August 2017 and August 2018 during 1-day trips to wet diving sample locations. RV Osprey and RV Zostera were used during these sample trips.

**Dataset Status**: complete

**Update Frequency**: planned

**Theme Keywords**:  Eastern Long Island Sound, Phase II Area, wet diving, suction samples, epifauna, emergent fauna, algae, seafloor habitat, University of Connecticut, UConn

**Access Constraints**: none

**Use Constraints**:  Data and metadata are is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link **must** be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org) and/or the Long Island Sound Habitat Mapping website (https://lismap.uconn.edu). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may

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**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**:  Data reports presence or abundance of organisms collected from the surface of a 0.5 $m^2$ area of seafloor. Collected samples were analyzed in full and accurately represent the organisms at that location.

**Completeness**:  Each sample record reports the complete results of analysis, sample location, sample date, and orthogonal images associated with the suction sample.

**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.

**Process Steps:**  Samples were collected via suction sampling. Suction sampling consisted of collecting epifauna within a 0.5$m^2$ quadrat area using a compressed air suction sampler. Samples were collected in sealable 0.5mm mesh bags connected to the suction sampler then transferred to storage containers and preserved in 70% EtOH for later processing. The 0.5m2 area selected for suction sampling was imaged prior to and following collection. Samples were sorted and collected organisms were identified to the lowest possible taxa. When possible, taxa abundance was determined; when this was not possible, taxa presence was reported.

**Attributes:**

SAMPLE_ID:  Unique identifier of suction sample; formatted as [*Date (ISO 8601)]_[Sample Site ID]_S_[Sample Container Identifier].*

IMAGES_ASSOCIATED:  Unique identifier of images of the 0.5m$^2$ area sampled.

YEAR:  Year of image capture; formatted as integer value [2017-2018].

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

LONGITUDE:  Longitude of sample site; formatted in decimal degrees; World Geodetic System 1984 datum.

LATITUDE:  Latitude of sample site; formatted in decimal degrees; World Geodetic System 1984 datum.

SAMPLE_AREA:  Sample block or site of wet diving sample location.

NEAR_SAMPLE_AREA: Sample blocks or sites nearest wet diving sample location.

DIVE_SITE_ID:  Unique Identifier of image capture location [SD01-SD12].

DIVE_SITE:  Text identifier of image capture location.

Identified Taxa and Biogenic Features (individually listed in dataset):  Organisms identified to lowest possible taxonomic level and biogenic features; abundance of taxa were reported formatted as integer values; presence of taxa were reported as present ["present"] or absent [0] formatted as text.

**Metadata reference**:  *{minimally: Name, org, phone/email}*  Ivar G. Babb, Department of Marine Sciences, University of Connecticut, 860-405-9123, babb@uconn.edu

**LISMaRC Phase II Epifauna Sample Block and Site Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2017)**

**METADATA**

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

**Publication Date**:  *6/30/2021*

**Dataset Title:** *LISMaRC Phase II Epifauna Sample Block and Site Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2017)*

*Filename: LISMaRC_BenthicEcology_2017_EpifaunaSeaBossBlockSite_Diversity.shp*

**Online Linkage***:*  [*http://www.marine-geo.org/portals/lis/*](http://www.marine-geo.org/portals/lis/)

**Abstract:** *The shapefile includes mean sample block- (SB) and site-specific (NB) diversity measures determined using analyzed images collected during USGS SEABed Observation and Sampling System (SEABOSS) operations in November and December 2017. Shapefile data includes block and site ID and diversity measures taxonomic and feature richness (S'), evenness (J), and Shannon-Weiner diversity ($H_{log10}$). These are the complete records of block- and site-level diversity.*

**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 November and December 2017.*

**Dataset Status**: *Complete*

**Update Frequency**: *None Planned*

**Theme Keywords**:  *Benthic ecology, Epifauna, diversity, habitat, seafloor imaging, SEABOSS, 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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*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**: *Shapefile object locations correspond to sample sites (NB) and the centroids of sample blocks (SB). Block and site locations were selected with the overall objective to sample as many of the different seafloor habitats that were evident in the side scan mosaic that had been previously developed for the study area.*

**Process Steps**: *Diversity indices were summarized as block- and site-specific mean values of taxonomic and feature richness (S'), evenness (J), and Shannon-Weiner diversity ($H_{log10}$) calculated at the scale of each analyzed image (n=602). Images were captured using the United States Geological Survey's (USGS) Seabed Observation and Sampling System (SEABOSS; Valentine et al. 2000) between November 28 and December 3, 2017 on the RV Connecticut.*

*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. Within-image measures of diversity and richness of taxa and biogenic features were determined per image.*

**Attributes:**

*Name:  Sample block or site.*

*S_taxa:  Taxa richness (S).*

*J_taxa:  Taxa evenness (J').*

*Hlg10_t:  Taxa Shannon-Weiner diversity index (H' $\log_{10}$).*

*S_feat:  Biogenic feature richness (S).*

*S_tx_ft:  Combined taxa and biogenic feature richness (S).*

*J_tx_ft:  Combined taxa and biogenic feature evenness (J').*

*Hlg10_tx_f:  Combined taxa and biogenic feature Shannon-Weiner diversity index (H' $\log_{10}$).*

*sm_2017:  Sample blocks and sites sampled in November or December 2017.*

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

**LISMaRC Phase II Epifauna Sample Block and Site Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2018)**

**METADATA**

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

**Publication Date**: *6/30/2021*

**Dataset Title:** *LISMaRC Phase II Epifauna Sample Block and Site Diversity Measures in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2018)*

*Filename: LISMaRC_BenthicEcology_2018_EpifaunaSeaBossBlockSite_Diversity.shp*

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

**Abstract:** *The shapefile includes mean sample block- (SB) and site-specific (NB) diversity measures determined using analyzed images collected during USGS SEABed Observation and Sampling System (SEABOSS) operations in May 2018. Shapefile data includes block and site ID and diversity measures taxonomic and feature richness (S'), evenness (J), and Shannon-Weiner diversity ($H_{log10}$). These are the complete records of block- and site-level diversity.*

**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, Connecticut, New York, Long Island Sound, Fishers Island Sound, estuary, Long Island Sound Mapping and Research Collaborative, LISMaRC*

**Access Constraints**: *none*

**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**: *Shapefile object locations correspond to sample sites (NB) and the centroids of sample blocks (SB). Block and site locations were selected with the overall objective to sample as many of the different seafloor habitats that were evident in the side scan mosaic that had been previously developed for the study area.*

**Process Steps**: *Diversity indices were summarized as block- and site-specific mean values of taxonomic and feature richness (S'), evenness (J), and Shannon-Weiner diversity ($H_{log10}$) calculated at the scale of each analyzed image (n=595). Images were captured using the United States Geological Survey's (USGS) Seabed Observation and Sampling System (SEABOSS; Valentine et al. 2000) between May 8 and 15, 2018 on the RV Connecticut.*

*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. Within-image measures of diversity and richness of taxa and biogenic features were determined per image.*

**Attributes:**

*Name:  Sample block or site.*

*S_taxa:  Taxa richness (S).*

*J_taxa:  Taxa evenness (J').*

*Hlg10_t:  Taxa Shannon-Weiner diversity index (H' $\log_{10}$).*

*S_feat:  Biogenic feature richness (S).*

*S_tx_ft:  Combined taxa and biogenic feature richness (S).*

*J_tx_ft:  Combined taxa and biogenic feature evenness (J').*

*Hlg10_tx_f:  Combined taxa and biogenic feature Shannon-Weiner diversity index (H' $\log_{10}$).*

*sm_2018:  Sample blocks and sites sampled in May 2018.*

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

**LISMaRC Phase II Select Biogenic Feature Abundance in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound during SEABOSS Operations (2017-2018)**

**METADATA**

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

**Publication Date**:  *6/30/2021*

**Dataset Title:** *LISMaRC Phase II Select Biogenic Feature Abundance in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound during SEABOSS Operations (2017-2018)*

*Filename: LISMaRC_BenthicEcology_2017_18_EpifaunaSeaBossBlockSite_SelectFeature.shp*

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

**Abstract:** *The shapefile includes sample block- (SB) and site-specific (NB) percent cover of select biogenic features. Feature percent cover were assessed for images collected during USGS SEABed Observation and Sampling System (SEABOSS) in November and December 2017 and May 2018. These are the complete records of block- and site-level feature abundance.*

**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, 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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**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**: *Shapefile object locations correspond to sample sites (NB) and the centroids of sample blocks (SB). Block and site locations were selected with the overall objective to sample as many of the different seafloor habitats that were evident in the side scan mosaic that had been previously developed for the study area.*

**Process Steps**: *Abundance was summarized as block- and site-specific mean percent cover of select biogenic features was determined in images each analyzed image (n=1197). Images were captured using the United States Geological Survey's (USGS) Seabed Observation and Sampling System (SEABOSS; Valentine et al. 2000) between November 28 and December 3, 2017 (n = 602) May 8 and 15, 2018 (n = 595) on the RV Connecticut.*

*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.*

**Attributes:**

*Name:  Sample block or site.*

*trrst___:  Mean percent cover of terrestrial vegetation.*

*Und_S__:  Mean percent cover of whole shell and shell pieces.*

*Zstr_s_: Mean percent cover of drift Zostera marina.*

*smpld_: Sample blocks and sites sampled.*

**Metadata reference**: *Christian W. Conroy, University of New Haven,* [cwconroy@newhaven.edu](mailto:cwconroy@newhaven.edu)

**LISMaRC Phase II Epifauna Sample Block and Site Simper Cluster, Distribution of Communities, and Geographic Regions in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2017-2018)**

**METADATA**

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

**Publication Date**:  *6/30/2021*

**Dataset Title:** *LISMaRC Phase II Epifauna Sample Block and Site Simper Cluster, Distribution of Communities, and Geographic Regions in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound Collected during SEABOSS Operations (2017-2018)*

*Filename: LISMaRC_BenthicEcology_2017_18_EpifaunaSeaBossBlockSite_Clusters.shp*

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

**Abstract:** *The shapefile includes sample block- (SB) and site-specific (NB) epifaunal community types determined using SIMPROF hierarchical clustering and broader geographic regions defined using community types and their spatial distribution. Taxon and biogenic feature abundance (SEABOSS images only) were assessed for images collected during USGS SEABed Observation and Sampling System (SEABOSS) in November and December 2017 and May 2018. These are the complete records of block- and site-level multivariate community analyses.*

**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 November and December 2017 and May 2018.*

**Dataset Status**: *Complete*

**Update Frequency**: *None Planned*

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

**Access Constraints**: *none*

**Use Constraints**: *Data and metadata are licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org).*

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**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**: *Shapefile object locations correspond to sample sites (NB) and the centroids of sample blocks (SB). Block and site locations were selected with the overall objective to sample as many of the different seafloor habitats that were evident in the side scan mosaic that had been previously developed for the study area.*

**Process Steps**: *Image data from all SEABOSS surveys were aggregated to block and site designations and mean values calculated to identify large scale variation in community structure (i.e., images within sites treated as replicates versus samples). Multivariate analyses were implemented with live taxa and biogenic features as well as live taxa only. SIMPROF was used to identify similarities between sites at the 1% threshold level for hierarchical cluster analyses.*

*A qualitative hierarchical approach for aggregating sites as implemented based on geographic proximity and similarity of ecological features. The most parsimonious was a set of four groupings representing coastal, west, central, and east regions within the map area.*

*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. Within-image measures of diversity and richness of taxa and biogenic features were determined per image.*

**Attributes:**

*Name:  Sample block or site.*

*Geo_Region:  Qualitative geographic regions based on the spatial distribution of community type.*

*Simp_Clust:  Sample block- or site-specific community type determined using SIMPROF hierarchical clustering.*

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

**LISMaRC Phase II Select Epifauna Taxa Abundance in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound during SEABOSS Operations (2017-2018)**

**METADATA**

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

**Publication Date**:  *6/30/2021*

**Dataset Title:** *LISMaRC Phase II Select Epifauna Taxa Abundance in the Long Island Sound Cable Fund Initiative Phase II area of eastern Long Island Sound during SEABOSS Operations (2017-2018)*

*Filename: LISMaRC_BenthicEcology_2017_18_EpifaunaSeaBossBlockSite_SelectTaxa.shp*

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

**Abstract:** *The shapefile includes sample block- (SB) and site-specific (NB) percent cover of select taxa. Taxon percent cover were assessed for images collected during USGS SEABed Observation and Sampling System (SEABOSS) in November and December 2017 and May 2018. These are the complete records of block- and site-level taxa abundance.*

**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, ROV, Connecticut, New York, Long Island Sound, Fishers Island Sound, estuary, Long Island Sound Mapping and Research Collaborative, LISMaRC*

**Access Constraints**: None

**Use Constraints**: *Data and metadata are licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. Appropriate acknowledgment with a byline/credit/link must be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.*

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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**: *Shapefile object locations correspond to sample sites (NB) and the centroids of sample blocks (SB). Block and site locations were selected with the overall objective to sample as many of the different seafloor habitats that were evident in the side scan mosaic that had been previously developed for the study area.*

***Process Steps****: Abundance was summarized as block- and site-specific mean percent cover of select epifaunal taxa as determined in images each analyzed image (n=1197). Images were captured using the United States Geological Survey's (USGS) Seabed Observation and Sampling System (SEABOSS; Valentine et al. 2000) between November 28 and December 3, 2017 (n = 602) May 8 and 15, 2018 (n = 595) on the RV Connecticut.*

*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.*

**Attributes:**

*Name:  Sample block or site.*

*Astrng_:  Mean percent cover of Astrangia poculata.*

*Cln_sp_:  Mean percent cover of Cliona spp.*

*Crymrp_:  Mean percent cover of Corymorpha pendula.*

*Crpdl_f:  Mean percent cover of Crepidula fornicata.*

*Ddmn_lc:  Mean percent cover of Diadumene leucolena.*

*Ddmnm_v:  Mean percent cover of Didemnum vexillum.*

*Hydrz__:  Mean percent cover of hydrozoan and bryozoan turfs.*

*Laminrc:  Mean percent cover of Laminariaceae.*

*Mytls_d:  Mean percent cover of Mytilus edulis.*

*Rhdphyt:  Mean percent cover of Rhodophyta.*

*smpld_:  Sample blocks and sites sampled.*

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