Dataset Originator: Roger D Flood, School of Marine and Atmospheric Sciences, Endeavour Hall Room 145, Stony Brook University, Stony Brook, NY 11794-5000
Publication Date: January 2025
Dataset Title: LIS4_Backscatter_NAD83_1m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows acoustic backscatter data at 300 kHz derived using multibeam mapping techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam backscatter data.
Dataset purpose: Seafloor acoustic backscatter collected by the 300 kHz multibeam bathymetry sonar system provides important information on the character of the sea floor, particularly sea-floor roughness, sediment type and other characteristics important to understanding benthic habitats. Not to be used for Navigation.
Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, 300 kHz multibeam backscatter, acoustic backscatter, SoMAS, Stony Brook University, PhysEnv, 2022
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."
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Data Quality -- Attribute accuracy:The values of acoustic backscatter reported here depend somewhat on the equipment used and the computer processing that is done in creating the backscatter images. Acoustic Backscatter data recorded can depends on the azimuth of the sonar track so the final images tried to keep acoustic data collected in a similar orientation. Although no quantitative analysis was done, the backscatter data reported during this project is qualitatively similar to that reported by NOAA for adjacent surveys when those backscatter values are appropriately stretched. The dataset shows the conditions at the time of the survey in August, September or December 2022 since the full multibeam bathymetry and backscatter datasets combines the results of three different surveys.
Data Quality -- Completeness: The is one element of a dataset that shows the seafloor conditions at the time of the SoMAS surveys done in August, September or December 2022 and the data from the three surveys have been combined into one grid.
Data Quality -- Positional accuracy: Horizontal positions are accurate to about 1 m
Process Steps: The 300 kHz multibeam backscatter data was collected using a Kongsberg EM 2040P MKII multibeam system and the backscatter data was processed using the CARIS HIPS and SIPS program version 11.4. Processing the backscatter data occurs after the multibeam bathymetry data is processed. Backscatter processing steps include creating a beam pattern file which allows for correction of across-track variations in acoustic backscatter and the backscatter data is gridded using the WMA-AVG (weighted moving average (WMA) with angular-varying gain (AVG)) options which corrects the backscatter based on the beam pattern file and also does an averaging of the backscatter values to reduce instrumental artifacts. The backscatter values for each survey are exported as a 32-bit backscatter grid with the backscatter intensities reported in decibels (dB). The backscatter values calculated for the August and September 2022 surveys agreed well where the surveys overlapped but the backscatter values collected in December 2022 were offset by up to 10 dB different. Slightly different multibeam settings were used during the December 2022 survey (256 depths

per swath rather than 400 depths per swath)
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Grid properties: image width (pixels): 26204 image height (pixels): 25827 pixel size: 1 (m)
Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

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Grid properties: image width (pixels): 13102 image height (pixels): 12914 pixel size: 2 (m)
Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

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Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513
Grid properties: image width (pixels): 5241 image height (pixels): 5166 pixel size: 5 (m)
Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

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Abstract: This bathymetry data set was collected using multibeam techniques by SoMAS, Stony Brook University at the beginning of the Phase 4 project (termed Phase 4A) of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). This particular data set combines the results of three field efforts in an area of Long Island Sound south of New Haven, CT. Our surveys were conducted in an area that was previously surveyed by NOAA for charting purposes but which did not have the 100% multibeam data needed for the benthic habitat study.
Dataset purpose: Seafloor bathymetry provides important information on water depth and on the character of features on the sea floor. This kind of data is important for understanding benthic habitat and sedimentary processes. Not to be used for Navigation.
Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, bathymetry, multibeam bathymetry, SoMAS, Stony Brook University, PhysEnv, 2022
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and CTD sensors to make vertical profiles of sound velocity and water properties. Kongsberg SIS5 and Seapath software manage the multibeam, navigation system and motion sensors, and a Dell Rugged 5424 laptop computer runs the software and records the survey data. Survey data is copied to disk drives or RAID arrays at frequent intervals during the survey for backup and for offline processing. A monitor on the bridge displays the vessels position with respect to the desired vessel track to assist the helmsman in following the desired track.
Satellite fixes reported by the Seapath system, our primary horizontal navigation system, are with respect to the ITRF 2014 reference frame while fixes reported by the Trimble BX982 system are with respect to the NAD83 reference frame. Vertical control for these surveys was based on the vertical component of GNSS satellite fixes for both the Seapath and Trimble systems, for both realtime and post-processed fixes, and from water-level measurements made at NOAA Station 8465705 at New Haven, CT. Vertical heights were converted to NAVD88 for all data sources using the NOAA program VDatum. Based on the comparison of these records the NOAA water-level record at New Haven was selected as the primary vertical height record for all three surveys except that the R/V Connecticut survey vertical record also included a time-varying height correction for fuel usage.
Offsets between the different instrument locations (i.e., transducer, motion sensor, GNSS receivers and waterline) were determined after the system installation and offsets were refined based on calibration tests done during the survey. Data processing was done using the revised instrument locations.
Bathymetry data was processed using CARIS HIPS and SIPS (version 11.4). Data were edited to remove spurious bed elevations and sound-velocity refraction corrections were applied. Data were gridded at 1 m resolution using the CUBE gridding algorithm for each survey. The three surveys were combined into one grid in ArcGIS Pro with a horizontal reference frame of ITRF 2014 UTM Zone 18N and a vertical reference frame of NAVD88. Our project required that the final maps be projected in the NAD83 (2011) reference frame so the grid was shifted south by 0.987 m and east by 0.313 m to convert the UTM Zone 18N grid from ITRF 2014 to NAD83 (2011). The entire data set gridded at 1 m is quite large (26204 by 25827 pixels) so versions of the data set gridded at 2 m and at 5 m where also created using the Aggregate command. The 32-bit geotiff bathymetry grids are projected in NAD_1983_2011_UTM_Zone_18N and seafloor elevations are reported in meters relative to NAVD-88.
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Access Constraints:none
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Point of Contact: Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu
Dataset Credit: Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu. T
Data Quality -- Attribute accuracy:Vertical elevations are accurate to about 0.1 to 0.2 m and horizontal positions are accurate to about 1 m. Elevations can be less accurate at the outer edges of the swath where refraction artifacts can occur. The dataset shows the conditions at the time of the surveys in August to December, 2022. The full multibeam bathymetry and backscatter dataset combines the results of three different surveys. The depths determined during this survey agree well (to better than +/- 0.1 m) with adjacent NOAA multibeam bathymetry surveys.
Data Quality -- Completeness: The is one element of a dataset that shows the seafloor conditions at the time of the SoMAS surveys done in August, September or December 2022 and the data from the three surveys have been combined into one grid.
Data Quality -- Positional accuracy: Horizontal positions are accurate to about 1 m
Process Steps: Bathymetric data was collected using a multibeam echosounder system during field programs on the UCONN Research Vessel R/V Connecticut (August 2022) and on the SoMAS Research Vessel Seawolf (September and December 2022) and our techniques followed the guidelines of the Office of Coast Survey publications "Hydrographic Survey Specifications and Deliverables" and "Field Procedures Manual". We used an EM 2040P MKII multibeam echosounder (portable processing unit version), a Seapath 130-5+ GNSS (GPS)/navigation unit and a motion sensor (MRU) in a submersible housing. GNSS (GPS) corrections for the Seapath system were obtained from a geosynchronous satellite using a Fugro receiver. We also use a Trimble BX982 GNSS receiver which can utilize RTN corrections transmitted by land stations, if cellular network signals are available, for high-resolution fixes as a backup for the Seapath position data. The states of New York and Connecticut both operate networks of land-based CORS/RTN stations (NYSNet is operated by NYSDOT and ACORN is operated by UCONN) which provide the needed GPS corrections over cellular networks. Other system components include an AML-3 sound velocity profiler with depth, SV

and CTD sensors to make vertical profiles of sound velocity and water properties. Kongsberg SIS5 and Seapath software manage the multibeam, navigation system and motion sensors, and a Dell Rugged 5424 laptop computer runs the software and records the survey data. Survey data is copied to disk drives or RAID arrays at frequent intervals during the survey for backup and for offline processing. A monitor on the bridge displays the vessels position with respect to the desired vessel track to assist the helmsman in following the desired track.
Satellite fixes reported by the Seapath system, our primary horizontal navigation system, are with respect to the ITRF 2014 reference frame while fixes reported by the Trimble BX982 system are with respect to the NAD83 reference frame. Vertical control for these surveys was based on the vertical component of GNSS satellite fixes for both the Seapath and Trimble systems, for both realtime and post-processed fixes, and from water-level measurements made at NOAA Station 8465705 at New Haven, CT. Vertical heights were converted to NAVD88 for all data sources using the NOAA program VDatum. Based on the comparison of these records the NOAA water-level record at New Haven was selected as the primary vertical height record for all three surveys except that the R/V Connecticut survey vertical record also included a time-varying height correction for fuel usage.
Offsets between the different instrument locations (i.e., transducer, motion sensor, GNSS receivers and waterline) were determined after the system installation and offsets were refined based on calibration tests done during the survey. Data processing was done using the revised instrument locations.
Bathymetry data was processed using CARIS HIPS and SIPS (version 11.4). Data were edited to remove spurious bed elevations and sound-velocity refraction corrections were applied. Data were gridded at 1 m resolution using the CUBE gridding algorithm for each survey. The three surveys were combined into one grid in ArcGIS Pro with a horizontal reference frame of ITRF 2014 UTM Zone 18N and a vertical reference frame of NAVD88. Our project required that the final maps be projected in the NAD83 (2011) reference frame so the grid was shifted south by 0.987 m and east by 0.313 m to convert the UTM Zone 18N grid from ITRF 2014 to NAD83 (2011). The entire data set gridded at 1 m is quite large (26204 by 25827 pixels) so versions of the data set gridded at 2 m and at 5 m where also created using the Aggregate command. The 32-bit geotiff bathymetry grids are projected in NAD_1983_2011_UTM_Zone_18N and seafloor elevations are reported in meters relative to NAVD-88.
Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513
Grid properties: image width (pixels): 5241 image height (pixels): 5166 pixel size: 5 (m)
Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

Dataset Originator: Roger D Flood, School of Marine and Atmospheric Sciences, Endeavour Hall Room 145, Stony Brook University, Stony Brook, NY 11794-5000
Publication Date: January 2025
Dataset Title: LIS4_NE-Hillshade_NAD83_1m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows bathymetric data that has been shaded by a synthetic sun (hillshade) in the northeast (NE) corner of the image. Bathymetric data was collected using multibeam techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam data. Hillshade images illuminated from the northwest (NW) were also generated because topography illuminated from different directions can highlight different elements of the seabed morphology.
Dataset purpose: Seafloor bathymetry provides important information on water depth and on the character of features on the sea floor. This kind of data is important for understanding benthic habitat. Hillshade images (bathymetry illuminated by a synthetic sun) show smaller-scale features that are often not recognized in the bathymetric data, and images illuminated from different directions can reveal different features. This images is illuminated from the northwest (NE). Not to be used for Navigation.
Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, bathymetry, multibeam bathymetry, hillshade bathymetry, SoMAS, Stony Brook University, PhysEnv, 2022
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Data Quality -- Completeness: The is one element of a dataset that shows the seafloor conditions at the time of the SoMAS surveys done in August, September or December 2022 and the data from the three surveys have been combined into one grid.
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Process Steps: Bathymetric data was collected using a multibeam echosounder system during field programs on the UCONN Research Vessel R/V Connecticut (August 2022) and on the SoMAS Research Vessel Seawolf (September and December 2022).
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Satellite fixes reported by the Seapath system, our primary horizontal navigation system, are with respect to the ITRF 2014 reference frame while fixes reported by the Trimble BX982 system are with respect to the NAD83 reference frame. Vertical control for these surveys was based on the vertical component of GNSS satellite fixes for both the Seapath and Trimble systems, for both realtime and post-processed fixes, and from water-level measurements made at NOAA Station 8465705 at New Haven, CT. Vertical heights were converted to NAVD88 for all data sources using the NOAA program VDatum. Based on the comparison of these records the NOAA water-level record at New Haven was selected as the primary vertical height record for all three surveys except that the R/V Connecticut survey vertical record also included a time-varying height correction for fuel usage.

Offsets between the different instrument locations (i.e., transducer, motion sensor, GNSS receivers and waterline) were determined after the system installation and offsets were refined based on calibration tests done during the survey. Data processing was done using the revised instrument locations.

Bathymetry data was processed using CARIS HIPS and SIPS (version 11.4). Data were edited to remove spurious bed elevations and sound-velocity refraction corrections were applied. Data were gridded at 1 m resolution using the CUBE gridding algorithm for each survey. The three surveys were combined into one grid in ArcGIS Pro with a horizontal reference frame of ITRF 2014 UTM Zone 18N and a vertical reference frame of NAVD88. Our project required that the final maps be projected in the NAD83 (2011) reference frame so the grid was shifted south by 0.987 m and east by 0.313 m to convert the UTM Zone 18N grid from ITRF 2014 to NAD83 (2011). The entire data set gridded at 1 m is quite large (26204 by 25827 pixels) so versions of the data set gridded at 2 m and at 5 m where also created using the Aggregate command. Hillshade images were created in CARIS HIPS and SIPS by shading the depth tile from the direction 045 degrees (NE) using a vertical exaggeration of 20 and a light-gray palette. The 8-bit hillshade images were exported as a GeoTiff image and the final 8-bit geotiff bathymetry grids are projected in NAD_1983_2011_UTM_Zone_18N.

Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513

Grid properties: image width (pixels): 26204 image height (pixels): 25827 pixel size: 1 (m)

Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

Dataset Originator: Roger D Flood, School of Marine and Atmospheric Sciences, Endeavour Hall Room 145, Stony Brook University, Stony Brook, NY 11794-5000
Publication Date: January 2025
Dataset Title: LIS4_NE-Hillshade_NAD83_2m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows bathymetric data that has been shaded by a synthetic sun (hillshade) in the northeast (NE) corner of the image. Bathymetric data was collected using multibeam techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam data. Hillshade images illuminated from the northwest (NW) were also generated because topography illuminated from different directions can highlight different elements of the seabed morphology.
Dataset purpose: Seafloor bathymetry provides important information on water depth and on the character of features on the sea floor. This kind of data is important for understanding benthic habitat. Hillshade images (bathymetry illuminated by a synthetic sun) show smaller-scale features that are often not recognized in the bathymetric data, and images illuminated from different directions can reveal different features. This images is illuminated from the northwest (NE). Not to be used for Navigation.
Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, bathymetry, multibeam bathymetry, hillshade bathymetry, SoMAS, Stony Brook University, PhysEnv, 2022
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."
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Data Quality -- Completeness: The is one element of a dataset that shows the seafloor conditions at the time of the SoMAS surveys done in August, September or December 2022 and the data from the three surveys have been combined into one grid.
Data Quality -- Positional accuracy: Horizontal positions are accurate to about 1 m
Process Steps: Bathymetric data was collected using a multibeam echosounder system during field programs on the UCONN Research Vessel R/V Connecticut (August 2022) and on the SoMAS Research Vessel Seawolf (September and December 2022).
We used an EM 2040P MKII multibeam echosounder (portable processing unit version), a Seapath 130-5+ GNSS (GPS)/navigation unit and a motion sensor (MRU) in a submersible housing. GNSS (GPS) corrections for the Seapath system were obtained from a geosynchronous satellite using a Fugro receiver. We also use a Trimble BX982 GNSS receiver which can utilize RTN corrections transmitted by land stations, if cellular network signals are available, for

high-resolution fixes as a backup for the Seapath position data. The states of New York and Connecticut both operate networks of land-based CORS/RTN stations (NYSNet is operated by NYSDOT and ACORN is operated by UCONN) which provide the needed GPS corrections over cellular networks. Other system components include an AML-3 sound velocity profiler with depth, SV and CTD sensors to make vertical profiles of sound velocity and water properties. Kongsberg SIS5 and Seapath software manage the multibeam, navigation system and motion sensors, and a Dell Rugged 5424 laptop computer runs the software and records the survey data. Survey data is copied to disk drives or RAID arrays at frequent intervals during the survey for backup and for offline processing. A monitor on the bridge displays the vessels position with respect to the desired vessel track to assist the helmsman in following the desired track.

Satellite fixes reported by the Seapath system, our primary horizontal navigation system, are with respect to the ITRF 2014 reference frame while fixes reported by the Trimble BX982 system are with respect to the NAD83 reference frame. Vertical control for these surveys was based on the vertical component of GNSS satellite fixes for both the Seapath and Trimble systems, for both realtime and post-processed fixes, and from water-level measurements made at NOAA Station 8465705 at New Haven, CT. Vertical heights were converted to NAVD88 for all data sources using the NOAA program VDatum. Based on the comparison of these records the NOAA water-level record at New Haven was selected as the primary vertical height record for all three surveys except that the R/V Connecticut survey vertical record also included a time-varying height correction for fuel usage.

Offsets between the different instrument locations (i.e., transducer, motion sensor, GNSS receivers and waterline) were determined after the system installation and offsets were refined based on calibration tests done during the survey. Data processing was done using the revised instrument locations.

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Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513

Grid properties: image width (pixels): 13102 image height (pixels): 12914 pixel size: 2 (m)

Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

Dataset Originator: Roger D Flood, School of Marine and Atmospheric Sciences, Endeavour Hall Room 145, Stony Brook University, Stony Brook, NY 11794-5000
Publication Date: January 2025
Dataset Title: LIS4_NE-Hillshade_NAD83_5m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows bathymetric data that has been shaded by a synthetic sun (hillshade) in the northeast (NE) corner of the image. Bathymetric data was collected using multibeam techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam data. Hillshade images illuminated from the northwest (NW) were also generated because topography illuminated from different directions can highlight different elements of the seabed morphology.
Dataset purpose: Seafloor bathymetry provides important information on water depth and on the character of features on the sea floor. This kind of data is important for understanding benthic habitat. Hillshade images (bathymetry illuminated by a synthetic sun) show smaller-scale features that are often not recognized in the bathymetric data, and images illuminated from different directions can reveal different features. This images is illuminated from the northwest (NE). Not to be used for Navigation.
Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, bathymetry, multibeam bathymetry, hillshade bathymetry, SoMAS, Stony Brook University, PhysEnv, 2022
Access Constraints:none
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Grid properties: image width (pixels): 5241 image height (pixels): 5166 pixel size: 5 (m)

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Publication Date: January 2025
Dataset Title: LIS4_NW-Hillshade_NAD83_1m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows bathymetric data that has been shaded by a synthetic sun (hillshade) in the northwest corner (NW) of the image. Bathymetric data was collected using multibeam techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam data. Hillshade images illuminated from the northeast (NE) were also generated because topography illuminated from different directions can highlight different elements of the seabed morphology.
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Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, bathymetry, multibeam bathymetry, hillshade bathymetry, SoMAS, Stony Brook University, PhysEnv, 2022
Access Constraints:none
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Point of Contact: Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu
Dataset Credit: Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu. T
Data Quality -- Attribute accuracy:The hillshade bathymetry shows smaller-scale features including any artifacts in the bathymetry due to uncorrected ship motion or refraction errors. Features on the hillshade images on the outer edges of the bathymetry swath may be refraction artifacts and features that cross the swath may be motion artifacts. Persistent along-track lineations are also present in some survey areas due to very small depth difference between beams. The dataset shows the conditions at the time of the survey in 2022. The full multibeam bathymetry and backscatter dataset combines the results of three different surveys.
Data Quality -- Completeness: The is one element of a dataset that shows the seafloor conditions at the time of the SoMAS surveys done in August, September or December 2022 and the data from the three surveys have been combined into one grid.
Data Quality -- Positional accuracy: Horizontal positions are accurate to about 1 m
Process Steps: Bathymetric data was collected using a multibeam echosounder system during field programs on the UCONN Research Vessel R/V Connecticut (August 2022) and on the SoMAS Research Vessel Seawolf (September and December 2022)
We used an EM 2040P MKII multibeam echosounder (portable processing unit version), a Seapath 130-5+ GNSS (GPS)/navigation unit and a motion sensor (MRU) in a submersible housing. GNSS (GPS) corrections for the Seapath system were obtained from a geosynchronous satellite using a Fugro receiver. We also use a Trimble BX982 GNSS receiver which can utilize RTN corrections transmitted by land stations, if cellular network signals are available, for

high-resolution fixes as a backup for the Seapath position data. The states of New York and Connecticut both operate networks of land-based CORS/RTN stations (NYSNet is operated by NYSDOT and ACORN is operated by UCONN) which provide the needed GPS corrections over cellular networks. Other system components include an AML-3 sound velocity profiler with depth, SV and CTD sensors to make vertical profiles of sound velocity and water properties. Kongsberg SIS5 and Seapath software manage the multibeam, navigation system and motion sensors, and a Dell Rugged 5424 laptop computer runs the software and records the survey data. Survey data is copied to disk drives or RAID arrays at frequent intervals during the survey for backup and for offline processing. A monitor on the bridge displays the vessels position with respect to the desired vessel track to assist the helmsman in following the desired track.

Satellite fixes reported by the Seapath system, our primary horizontal navigation system, are with respect to the ITRF 2014 reference frame while fixes reported by the Trimble BX982 system are with respect to the NAD83 reference frame. Vertical control for these surveys was based on the vertical component of GNSS satellite fixes for both the Seapath and Trimble systems, for both realtime and post-processed fixes, and from water-level measurements made at NOAA Station 8465705 at New Haven, CT. Vertical heights were converted to NAVD88 for all data sources using the NOAA program VDatum. Based on the comparison of these records the NOAA water-level record at New Haven was selected as the primary vertical height record for all three surveys except that the R/V Connecticut survey vertical record also included a time-varying height correction for fuel usage.

Offsets between the different instrument locations (i.e., transducer, motion sensor, GNSS receivers and waterline) were determined after the system installation and offsets were refined based on calibration tests done during the survey. Data processing was done using the revised instrument locations.

Bathymetry data was processed using CARIS HIPS and SIPS (version 11.4). Data were edited to remove spurious bed elevations and sound-velocity refraction corrections were applied. Data were gridded at 1 m resolution using the CUBE gridding algorithm for each survey. The three surveys were combined into one grid in ArcGIS Pro with a horizontal reference frame of ITRF 2014 UTM Zone 18N and a vertical reference frame of NAVD88. Our project required that the final maps be projected in the NAD83 (2011) reference frame so the grid was shifted south by 0.987 m and east by 0.313 m to convert the UTM Zone 18N grid from ITRF 2014 to NAD83 (2011). The entire data set gridded at 1 m is quite large (26204 by 25827 pixels) so versions of the data set gridded at 2 m and at 5 m where also created using the Aggregate command. Hillshade images were created in CARIS HIPS and SIPS by shading the depth tile from the direction 315 degrees (NW) using a vertical exaggeration of 20 and a light-gray palette. The 8-bit hillshade images were exported as a GeoTiff image and the final 8-bit geotiff bathymetry grids are projected in NAD_1983_2011_UTM_Zone_18N.

Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513

Grid properties: image width (pixels): 26204 image height (pixels): 25827 pixel size: 1 (m)

Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

Dataset Originator: Roger D Flood, School of Marine and Atmospheric Sciences, Endeavour Hall Room 145, Stony Brook University, Stony Brook, NY 11794-5000
Publication Date: January 2025
Dataset Title: LIS4_NW-Hillshade_NAD83_2m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows bathymetric data that has been shaded by a synthetic sun (hillshade) in the northwest corner (NW) of the image. Bathymetric data was collected using multibeam techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam data. Hillshade images illuminated from the northeast (NE) were also generated because topography illuminated from different directions can highlight different elements of the seabed morphology.
Dataset purpose: Seafloor bathymetry provides important information on water depth and on the character of features on the sea floor. This kind of data is important for understanding benthic habitat. Hillshade images (bathymetry illuminated by a synthetic sun) show smaller-scale features that are often not recognized in the bathymetric data, and images illuminated from different directions can reveal different features. This images is illuminated from the northwest (NW). Not to be used for Navigation.
Time period of content: August 2022 to December 2022
Dataset Status:complete
Update Frequency: none planned
Theme Keywords: Long Island Sound, Cable Fund, benthic habitat, Phase 4, Phase 4A, LISS Enhancement, bathymetry, multibeam bathymetry, hillshade bathymetry, SoMAS, Stony Brook University, PhysEnv, 2022
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Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513

Grid properties: image width (pixels): 13102 image height (pixels): 12914 pixel size: 2 (m)

Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.

Dataset Originator: Roger D Flood, School of Marine and Atmospheric Sciences, Endeavour Hall Room 145, Stony Brook University, Stony Brook, NY 11794-5000
Publication Date: January 2025
Dataset Title: LIS4_NW-Hillshade_NAD83_5m.tif
Online linkage: http://www.marine-geo.org/portals/lis/
Abstract: This map shows bathymetric data that has been shaded by a synthetic sun (hillshade) in the northwest corner (NW) of the image. Bathymetric data was collected using multibeam techniques by SoMAS, Stony Brook University, during Phase 4A of the Long Island Sound Cable Fund Benthic Habitat Mapping Initiative (LISS Enhancement). The survey block is south of New Haven and is an area that was previously surveyed by NOAA for charting purposes but where there was not 100% multibeam data. Hillshade images illuminated from the northeast (NE) were also generated because topography illuminated from different directions can highlight different elements of the seabed morphology.
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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."
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Bounding box:left: 660443.950 top: 4567549.513 right: 686647.950 bottom: 4541722.513

Grid properties: image width (pixels): 5241 image height (pixels): 5166 pixel size: 5 (m)

Metadata reference:Roger D Flood, SoMAS, Stony Brook University, 631-632-6971/631-632-8700, roger.flood@stonybrook.edu, Project final report: Multibeam Mapping in Long Island Sound -- LISS Enhancement, SoMAS Stony Brook University, June 6, 2025. These data files and the raw multibeam data are being prepared for submission to NOAA NCEI for accessibility and archiving.