PONAR IMAGING AND SAMPLING SYSTEM FOR ASSESSING HABITAT (PISSAH) PHASE IIIA VIDEO ACQUISITION

METADATA

Dataset Originator: *University of Connecticut: Ivar G. Babb*

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Dataset Title: ***PISSAH Phase IIIA Video Acquisition***

Online Linkage:

LDEO Data Repository - http://www.marine-geo.org/portals/lis/

Data_doi=

Data url=

Abstract:

This dataset contains the raw video files obtained by the Ponar Imaging and Sampling System for Assessing Habitat (PISSAH) developed by the Long Island Sound Mapping and Research Collaborative (LISMaRC) to obtain both physical sediment grab samples and ultra-high definition (4K) video using the latest version of GoPro cameras. A four-day survey using the Ponar Imaging and Sampling System for Assessing Habitat (PISSAH) deployed from the Research Vessel Weicker was conducted from June 12-16, 2023 including mobilization and demobilization. The PISSAH was used to acquire both physical sediment grab samples as well as the GoPro video from 60 sites in the Phase III area of the Long Island Sound Cable Fund (LISCF) Seafloor Habitat Mapping Initiative. These two data sources were provided to the team led by Roger Flood from the Stony Brook University to assist with the interpretation of new and existing acoustic backscatter data in the area.

Dataset purpose:

This dataset of the raw video obtained by the GoPro cameras was deemed the most cost-effective means to acquire imagery of the seafloor in the Phase IIIA area designated by the LISCF Seafloor Habitat Mapping Initiative. The videos served as the source of individual frame grabs that were in turn analyzed using ImageJ software to assess the nature of the seafloor taxa and seafloor sediment type. A total of 60 sites were identified in the Phase IIIA area based upon an analysis of existing acoustic backscatter data obtained from multiple surveys by NOAA that exhibited what appeared to be inconsistent gray scale settings. The 60 sites provided not only the sediment grab samples for grain size analyses, but also the video for an additional visual assessment of the nature of the seafloor. These two elements (grain size, image analysis) were to provide up to date ground truth data to assist with the interpretation and integration of new acoustic data with the existing NOAA data to develop a seamless backscatter mosaic by the LISCF partner, Stony Brook University.

Time period of content:

The PISSAH survey was conducted from June 12 to the 16th, which included days to mobilize the system on the RV Weicker. Data was collected on the 12th to the 15th.

Dataset Status: *Complete*

Update Frequency: *None planned*

Theme Keywords:

Connecticut, New York, Long Island Sound, estuary, RV Lowell Weicker, backscatter, multibeam sonar, raw data, GoPro, video, University of Connecticut, UConn, Long Island Sound Mapping and Research Collaborative, LISMaRC, Long Island Sound Cable Fund, LISCF, sediment grab samples, sediment grain size, epifauna, structure forming taxa.

Access Constraints: *None*

Use Constraints:

Point of Contact:

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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 Cable Fund Seafloor Habitat Mapping Initiative 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:

See below for positional accuracy.

Completeness:

Complete - Representative images from each of the 60 sites have been analyzed for attendant taxa and seafloor type and links to the images and data results have been provided to the Stony Brook University team.

Positional accuracy:

Sample Site Positional Accuracy – As mentioned above, the 60 sites were chosen in the Phase III area based upon examination of the existing NOAA backscatter data imported into ESRI's ArcGIS Pro. The determinants for the site selection were for: 1) sites that showed vastly different backscatter values within a small area, hence needed groundtruthing to determine which reading was more accurate and 2) for sites within the two areas selected as reference areas that were the target of the new data acquisition, and would, therefore, provide a better sense of the true nature of the new backscatter data to aid in the interpretation of these data and to assist with normalizing the existing data with the new . The latitude and longitude of the sites were determined from the GIS, based upon the positional accuracy of the imported NOAA GeoTiff file of the backscatter mosaic.

Video File Positional Accuracy – The position of the sampler was assumed to be directly below the stern of the vessel, although there may have been some deviation from this position based upon the unit being pushed by any bottom currents. Given this assumption, a GPS antenna was mounted on the stern rail of the RV Weicker to provide an accurate record of the position of the PISSAH throughout the course of the deployment. The GPS receiver was a GlobalSat BU-353N5 connected via USB to a laptop operating ArcGIS Pro. The GlobalSat web site describes the receiver as: "very high sensitivity chipset (Tracking Sensitivity: -165 dBm), with extremely fast TTFF (Time To First Fix) at low signal level and support of NMEA 0183 data protocol. The USB GPS is WAAS/EGNOS capable, and for units sold in North America through authorized resellers, these units are WAAS/EGNOS enabled unless otherwise stated. Accuracy can be up to 5 meters 3D RMS with WAAS enabled and 10-15 meters 2D RMS WAAS disabled." The 3D RMS was enabled, therefore, the positional accuracy of the PISSAH and therefore the acquired video was assumed to be ~5 meters.

Process Steps:

The PISSAH was deployed off the stern of the RV Weicker and lowered to approximately one meter off from the bottom, however, very low visibility resulted in very poor quality video, even though the primary (down looking) GoPro camera was mounted very near the bottom of the sampler, and therefore as close as possible to the bottom without making contact. The deployment transects averaged between five to ten minutes, depending upon visibility, with lower visibility resulting in shorter deployments. In many of these cases the only useable video was the frame(s) immediately prior to taking the sample when the unit was closest to the seafloor.

The time recorded by the GoPro's was set to GMT/UTC. The GoPro cameras were started prior to deployment and stopped upon retrieval on the deck. At the start of each deployment the site/transect location was noted on a dry erase board placed in the view of the camera as was an IPhone, also set to UTC, showing the time of deployment. The original file naming convention assigned by the GoPro cameras (e.g. GX010061.MP4) was maintained and recorded for each deployment/transect. The files were downloaded from the GoPro cameras to duplicate external hard drives daily for subsequent analysis.

Process Contact: *Christopher Conroy, University of New Haven, cwconroy@newhaven.edu*

Attributes:

Raw Data Files: The GoPro 10 cameras recorded the HEVC video format in the .MP4 wrapper at a resolution of 5312x2998 pixels and data rate of 60 megapixels/second. The frame captures used for the analyses were saved in .tiff format with PackBits compression at 3840x2160 pixels using the RGB color model.

The vessel track was recorded every second into a .csv (comma separated value) file, with the date/time/time_ISO8601 and latitude and longitude in decimal degrees recorded.

Metadata reference: *Ivar G. Babb, University of Connecticut, Department of Marine Sciences, 401-529-4022, ivar.babb@uconn.edu*