

DEPOSITIONAL HISTORY OF THE PAST 20,000 YEARS IN WESTERN LONG ISLAND SOUND, NEW YORK

Vadim Acosta and Cecilia McHugh, Earth and Environmental Sciences, Queens College, City University of New York

Wanda Vargas, Environmental, Geographic, and Geological Sciences, Lehman College, City University of New York

Marie-Helene Cormier, Department of Geological Sciences, University of Missouri at Columbia, Missouri

One of the major scientific objectives was to study the deglaciation of the Laurentide Ice Sheet and Holocene transgression of sea level in western Long Island Sound to document age, sedimentation processes, and climate from high-resolution geophysics and sediment cores. Our initial results show four seismic units that we interpret as glacial moraines or bedrock, glacial lake sediments, transgressive marine and initiation of estuarine conditions, and recent sedimentation. The data was collected during a one-week survey of western Long Island Sound in June 2006 from the R/V *HUGH SHARP*. Multibeam bathymetry, chirp subbottom profiling, side-scan sonar imagery, and sediment samples (25 gravity cores, 11 multicores, and 10 grabs) were collected.

Subbottom penetration reached in some instances 40 m, but is limited to less than 5 m where sediments are gas-charged. Four seismic sequences are imaged on the chirp records that we interpret to span the Last Glacial Maximum to Present: strong irregular erosional surfaces beneath parallel seismic reflectors are interpreted as glacial erosional surface and/or moraines, and as glacial lake sediments ~25 m thick, respectively. A thin veneer (<1 m) of acoustically transparent sediment is interpreted as recent deposits by dating the sediments with short-lived radioisotope and correlating the core data to the acoustic images. Recent sediments overlay a roughly 15 m thick unit interpreted as Holocene transgressive marine. Glacial Lake Connecticut has been well documented to the east of the study area by Lewis and DiGiacomo-Cohen (2000) and others. Bockunewicz proposed that there was another, smaller glacial lake to the west. Our data suggests that the lake imaged in western Long Island Sound was the smaller glacial lake proposed by Bockunewicz and that this lake that was separated from Glacial Lake Connecticut by bedrock.

Acknowledgments: We thank the Captain, officers, crew and scientific party of the R/V Hugh Sharp for their efforts during the collection of the data.

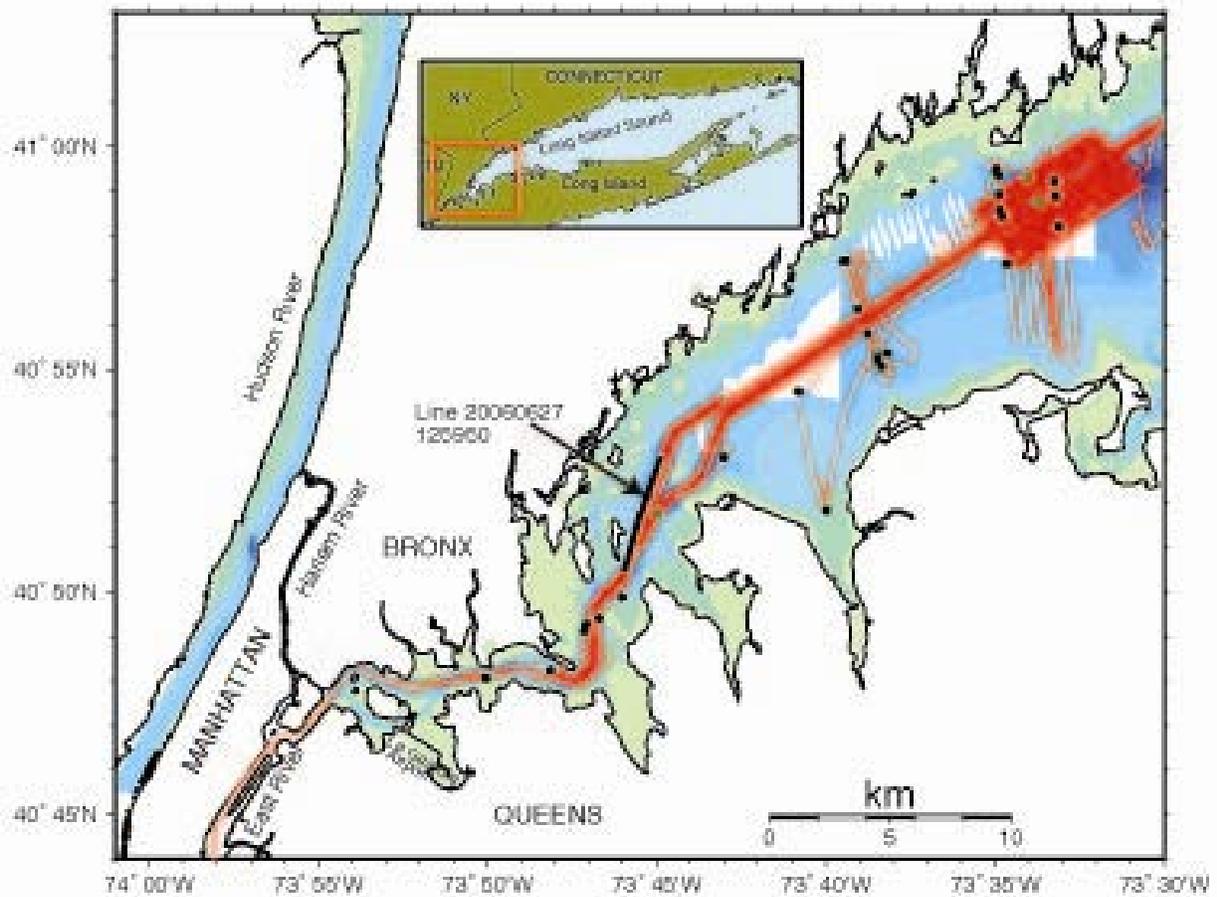


Fig. 1. Location of study area in western Long Island Sound. Red lines mark the location of the navigation tracks. Black dots show the sampling stations. Green line marks the location of the subbottom seismic profile.

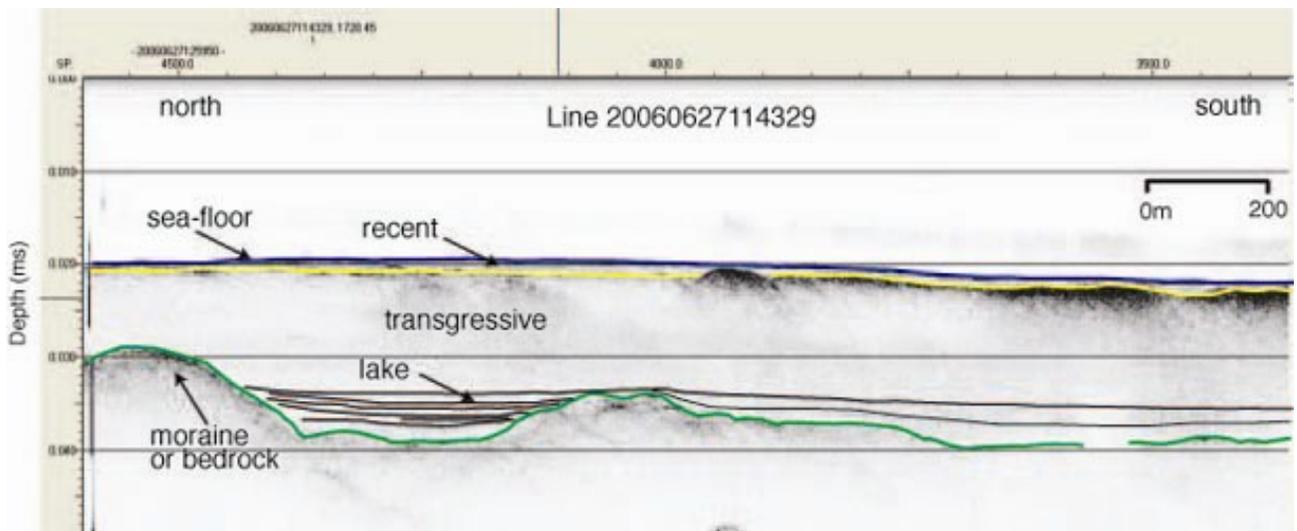


Fig. 2. High-resolution subbottom profile image showing the seismic units: moraine or bedrock; lake sediments, marine transgressive, and recent sedimentation.

References:

Lewis, R.S., and DiGiacomo-Cohen, M. 2000. A Review of the Geologic Framework of the Long Island Sound Basin, With Some Observations Relating to Postglacial Sedimentation. *Journal of Coastal Research*, v. 16. No. 3, p. 522-533

Bockunewicz. H., SUNY, Stony Brook: Paleomap Project, Nassau County, NY.