Investigate Geology of Connecticut

SUMMARY:

Beacuse of the enormous surrounding population, Long Island Sound is stressed by anthropogenic wastes and contaminants that flow into the estuary. However, understanding the benthic environmental problems requires detailed maps of the sediments and sedimentary environments. Presently, our regional interpretations of sedimentary processes in Long Island Sound are based solely on regional reconnaissance (spaced-line) and scattered detailed ("postage-stamp"-sized) sidescan sonar surveys. However, continuous-coverage imagery is critical to: (1) defining the geological variability of the sea floor, which is one of the primary controls of benthic habitat diversity; (2) improving our understanding of the processes that control the distribution and transport of bottom sediments and the distribution of benthic habitats and associated infaunal community structures; and (3) providing a detailed framework for future research, monitoring, and management activities.

INVESTIGATORS:

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DESCRIPTION:

This project, which responds to the Director's call for interdisciplinary partnerships with NOAA, is partially funded through the Connecticut/USGS Cooperative, a long-standing agreement to map the sea floor and to investigate the geological framework and surficial processes of Long Island Sound. Although since 1996 NOAA has completed extensive sidescan and multibeam bathymetric surveys throughout the Sound, until recently these data were extensively filtered to produce navigation charts and not processed into formats suitable for continuous-coverage imagery and a GIS. We propose to closely cooperate with NOAA personnel on the acquisition, processing, and geological interpretation of the NOAA backscatter and bathymetric data, and to incorporate the basic data and interpretations into GIS data layers, greatly enhancing and expanding the existing coverages within the Sound. These coverages will also directly support a hard-mineral assessment planned as part of the Marine Aggregate Resources and Processes Project, and ongoing collaborative benthic habitat studies in the eastern Sound (Zajac and others, 2000; Zajac and others, 2003).

START DATE OF PROJECT:

July 1, 2001

END DATE OF PROJECT:

June 30, 2010

TOPIC:

Coastal and Marine Geology

APPROACH:

During FY2003 existing raw and partially processed sidescan sonar data from central and western Long Island Long Island Sound were acquired from NOAA, and relationships were set up to acquire additional data sets as they become available. These data have been appraised and processing procedures necessary to incorporate the imagery into GIS data layers (e.g. tonal manipulation, reprojection,..etc) are being established. During FY2004, the data from the central and western Sound will be interpreted and published. We will initiate collaborative acquisition, processing, and interpretation of new NOAA imagery data from the eastern Sound. The acquisition phase will involve cruise participation aboard the NOAA Ship Littlehales. Existing samples and bottom photography, previously collected through the Connecticut/USGS cooperative (Poppe and Polloni, 1998), will be used to ground-truth the images and produce geological interpretations. Resultant data layers will be incorporated into the Woods Hole Field Center's Long Island Sound Project website and into the Center's ArcIMS.

IMPACT/RESULTS:

After processing and interpretation, the backscatter and bathymetric data will be cooperatively disseminated by the USGS and NOAA and posted on the website of the USGS Woods Hole Field Center. Specific outreach activities related to this data set will include: 1) informal discussions concerning its availability with various organizations, agencies, and corporate and university groups in the Long Island Sound community, 2) answering inquiries concerning the presented information, 3) incorporating the sidescan sonar data into the Connecticut DEP's Long Island Sound Resource Center GIS and posting GIS data layers on the Coastal and Marine Geology Program's interactive mapserver, and 4) publicizing its availability via newsletters (e.g. Long Island Sound Study), a Connecticut Department of Environmental Protection Fact Sheet, and conference presentations (e.g. Long Island Sound Research Conference).

PUBLICATIONS:

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- Poppe, L.J., Lewis, R.S., Denny, J.F., DiGiacomo-Cohen, M.L., and Parolski, K.F., 1999 Sidescan sonar image, surficial geologic interpretation, and bathymetry of the Long Island Sound sea floor around Falkner Island, Connecticut: U.S. Geological Survey Geologic Investigations Map I-2671, 2 sheets, scale 1:10,000.
- Poppe, L.J., Lewis, R.S., Denny, J.F., Parolski, K.F., and DiGiacomo-Cohen, M.L., 1998, Sidescan sonar image, surficial geologic intrepretation and bathymetry of Fishers Island Sound, Connecticut, New York, and Rhode Island: U.S. Geological Survey Geologic Investigations Map I-2640, 2 sheets, scale 1:12,500.
- Poppe, L.J., Lewis, R.S., Denny, J.F., Parolski, M.L., DiGiacomo-Cohen, M.L., and Tolderlund, D.S., 1998, Sidescan sonar image, surficial geologic interpretation, and bathymetry of the Long Island Sound sea floor in Niantic Bay, Connecticut: U.S. Geological Survey Geologic Investigations Map I-2625, 2 sheets, scale 1:11,750.
- Poppe, L.J., Lewis, R.S., Knebel, H.J., Haase, E.A., Parolski, K.F., and DiGiacomo-Cohen, M.L., 2001, Sidescan sonar images, surficial geologic interpretations, and bathymetry of New Haven Harbor, Connecticut, and the New Haven Dumping Ground, north-central Long Island Sound: U.S Geological Survey Geologic Investigations Series Map I-2736, 2 sheets, pamphlet, 8 p.
- Poppe, L.J., Lewis, R.S., Quarrier, S., and Zajac, R., 1994, Map showing the distribution of surficial sediments in Fishers Island Sound, New York, Connecticut, and Rhode Island: U.S. Geological Survey Miscellaneous Investigations Series Map I-2456, 1 sheet.
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- Poppe, L.J. and Polloni, C., editors, 1998, Long Island Sound Environmental Studies: U.S. Geological Survey Open-File Report 98-502, CD-ROM.
- Poppe, L.J., Knebel, H.J., Lewis, R.S., and DiGiacomo-Cohen, M.L., 2002, Processes controlling the remobilization of surficial sediments and formation of sedimentary furrows in north- central Long Island Sound: Journal of Coastal Research, v. 18, 741-750.
- Poppe, L.J., Knebel, H.J., Mlodzinska, Z.J., Hastings, M.E., and Seekins, B.A., 2000, The distribution of surficial sediment in Long Island Sound and adjacent waters: texture and total organic carbon: Journal of Coastal Research, v. 16, no. 3, p. 567-574.
- Poppe, L.J., Lewis, R.S., and Moffett, A.M., 1992, Texture of surficial sediments in northeastern Long Island Sound: U.S. Geological Survey Open-File Report 92-550, 13 p.
- Poppe, L.J., Paskevich, V.F., Lewis, R.S., and DiGiacomo-Cohen, M.L., 2002, Geological framework data from Long Island Sound, 1981-1990: a digital data release: U.S. Geological Survey Open-File Report 02-002, DVD-ROM.