

Mapping the Sea Floor Geology Offshore of The New York-New Jersey Metropolitan Area Using Sidescan-Sonar: Preliminary Report

by

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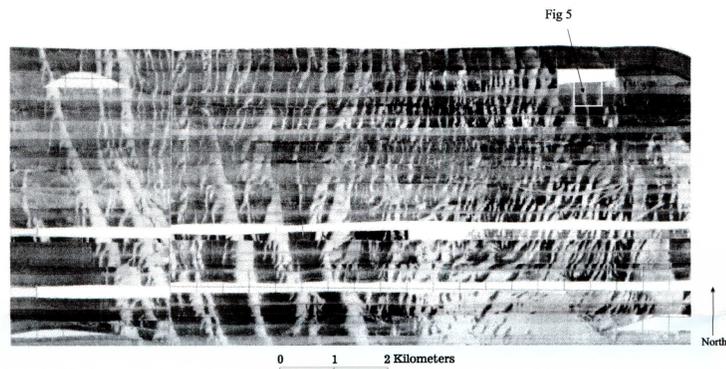


Figure 4. Sidescan-sonar image of the nearshore region off Long Beach, Long Island (see Figure 3 for location), showing high-backscatter depressions with rippled floors that extend from the shoreward edge of the study area to 9 km offshore. These features are thought to be erosional in origin and indicative of storm-induced cross-shelf sediment transport from the shoreface to the inner shelf.

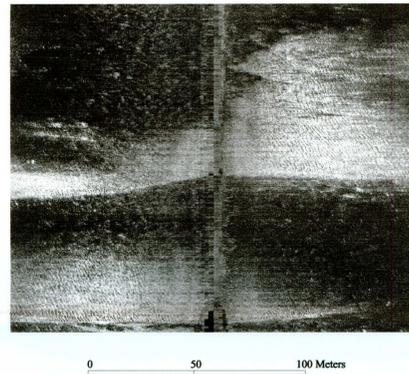


Figure 5. Enlarged image of two rippled scour depressions showing the long-crested ripples which floor the depressions (see Figure 4 for location).

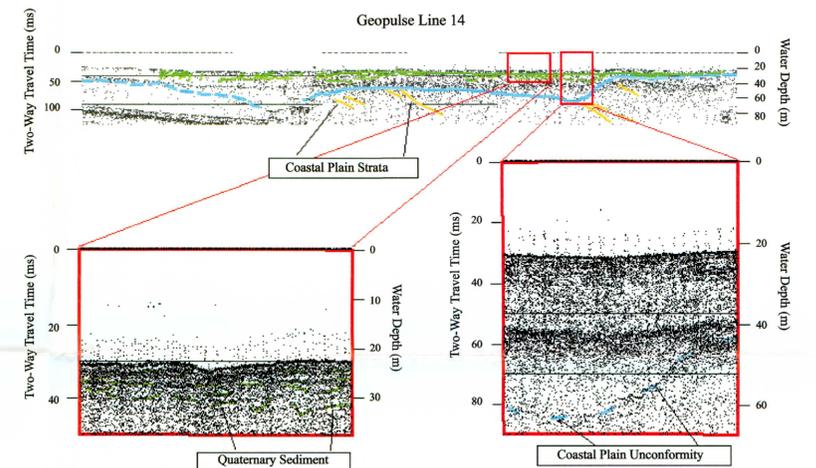


Figure 6. Representative Geopulse profile off the south shore of Long Island and interpretive sketch (see Figure 3 for location) showing major features in the northern segment of the study area as described in the text.

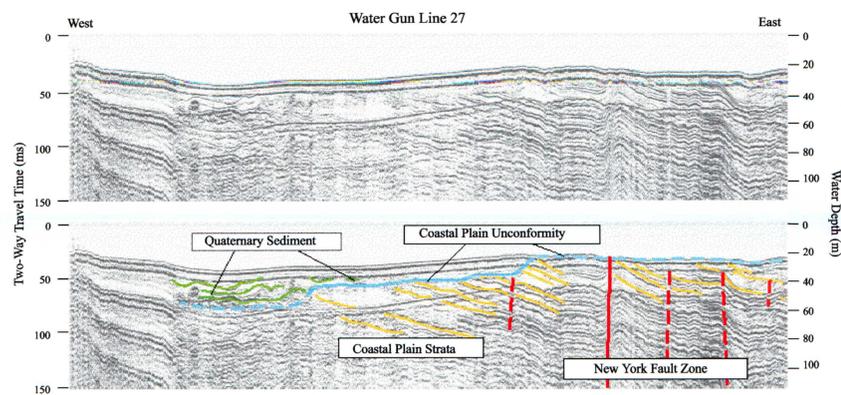


Figure 7. Representative 15 cubic-inch watergun profile in the northern segment of the study area (see Figure 3 for location) showing the major features as described in the text. Faults are shown as red lines (dashed where uncertain).



Figure 8. Sidescan-sonar image in the northeast segment of the study area where Coastal Plain deposits crop out or are near the sea floor (see Figure 3 for location). High backscatter areas are areas of outcropping Coastal Plain strata or gravelly sediment (thought to be a lag deposit resulting from erosion of the Coastal Plain strata) while moderate to low backscatter areas are areas of medium- to fine-grained surface sediments. The linear areas of high backscatter that trend approximately north-south (labeled A) may result from bedload transport to the south, a transport direction consistent with the dominant transport during northeast storms (Butman and others, 1979).

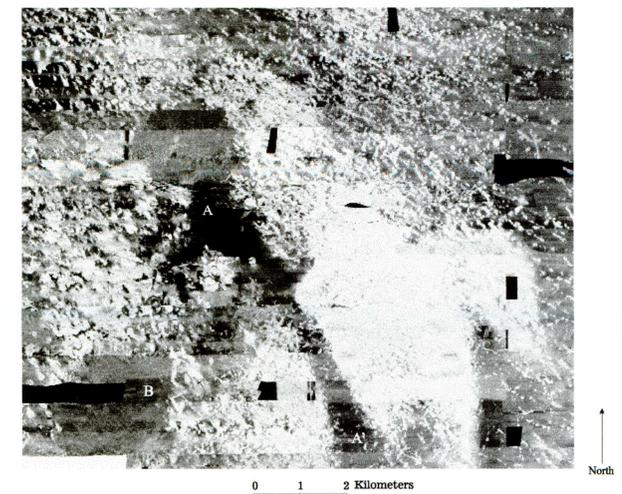


Figure 9. Sidescan-sonar image in the area of the present Mud Dumpsite (see Figure 2 for bathymetry and Figure 3 for location). The area is marked by numerous small high-backscatter "dots" which are interpreted as individual dumps of dredged and other material disposed of in this region since the late 1800's. A shallow valley (relief of a few meters) less than 0.5-km wide with a low-backscatter floor that trends northwestward from the head of the Hudson Shelf Valley through the southern portion of the Mud Dumpsite (A - A'), is possibly a sink and/or conduit to the Hudson Shelf Valley for fine-grained material winnowed from the Mud Dumpsite. A roughly circular, moderate backscatter area in the southern end of the present Mud Dumpsite (B) is the location of a dump of dioxin-contaminated material disposed of in the late 1980's and latter capped with coarse sand.

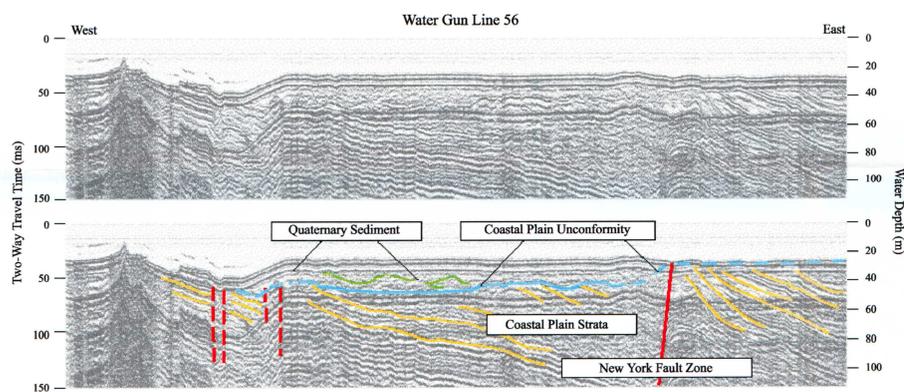


Figure 10. Representative 15 cubic-inch watergun subbottom profile (see Figure 3 for location) showing major features in the central segment of the study area as described in the text. Faults are shown as red lines (dashed where uncertain).

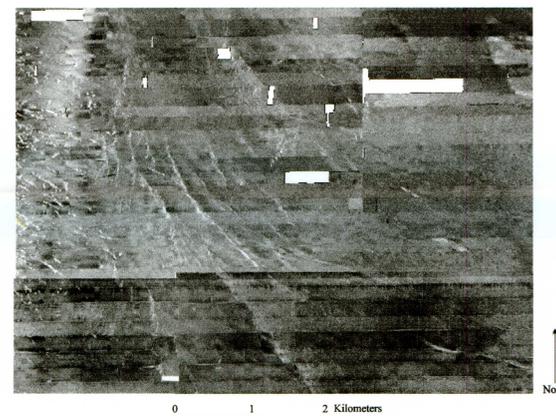


Figure 11. Sidescan-sonar image showing bands of moderate and low backscatter, interpreted to be large sand waves oriented subparallel to the thalweg of the Hudson Shelf Valley, suggesting some active sediment transport in an area of relatively uniform moderate-low backscatter (medium- to fine-grained sand) in the Sewage Disposal Site (see Figure 3 for location).

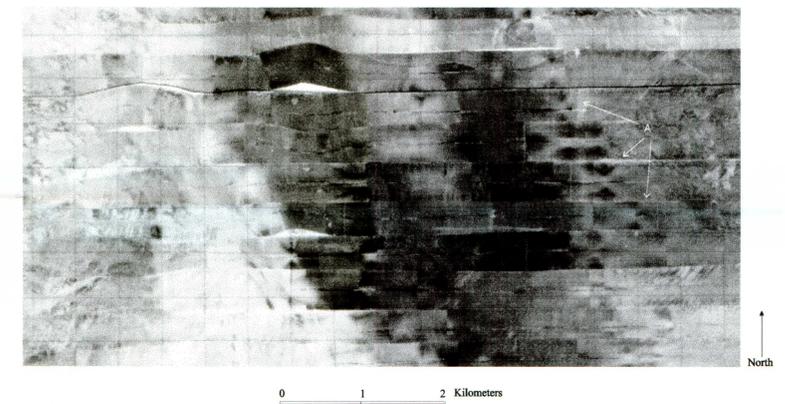


Figure 12. Sidescan-sonar image showing the low-backscatter Hudson Shelf Valley and adjacent moderate- and high-backscatter shelf areas (see Figure 3 for location). The difference in backscatter intensity in the adjacent shelf areas suggests that the Hudson Shelf Valley traps fine sand and mud transported along the shelf from the northeast. The trend of circular features of low backscatter (A) along the eastern flank of the Hudson Shelf Valley correlates to a possible offset (fault) of underlying Coastal Plain strata (Figure 13).

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