

The Geologic History of Rockaway Barrier Beach, New York

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The evolution of Rockaway barrier beach and the influence of storm energy on the sediment budget for both the natural shore and the engineered shore is investigated. Bathymetric maps of the eastern end of Rockaway dated 1866, 1874, 1902, 1910, 1937, 1948, 1965 and 1975 are redrawn and computerized. Departure maps are generated depicting the spatial distribution of erosion and deposition from which the sediment budget is calculated. The Rockaway barrier was a compound recurved spit, in which the onshore and offshore morphology evolved naturally prior to the 1933 jetty construction. The barrier prograded westward by accretion of hooks in the spit area, transported in the littoral drift system and initially building the spit platform as submerged terminal beach ridge sand tongues. The westward migrating Rockaway Inlet Channel is associated with trailing shoals on the ocean side of the spit, erosion of the tidal inlet shoals and channel margin linear bars on the western bank of the channel, deposition on the eastern bank forming the spit platform, and deposition along the bay shore, broadening the peninsula while filling in the interdigital bays of the spit. From the time of the Rockaway inlet construction until the end of the 1900s, the Rockaway's western offshore and inlet channel became increasingly stabilized while extensive deposition occurred adjacent to the jetty. Prior to coastal engineering, the net changes in the sediment budget is a function of storm energy. After coastal erosion, the amount of average annual net change in the sediment budget becomes a function of time. The jetty trap basin is now filled, closing the window of jetty stabilization.