

# APPLIED COASTAL

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**Project:** Winthrop Shores Reservation  
Restoration - Boston Harbor  
Beaches Program, Winthrop, MA

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Applied Coastal personnel are in the process of designing a beach nourishment project for shore protection of Winthrop Shore Drive and evaluating borrow sources for potential nourishment material. Preliminary analysis of existing conditions includes historical shoreline change, evaluation of coastal structures, and initial assessment of available data. The existing conditions report, completed in 1999, concluded that the groin field along the shoreline would require reconstruction and revision; however, the offshore breakwaters (known as the “Five Sisters”) were in relatively good condition. Subsequent analyses indicated that the primary area requiring beach nourishment as shore protection was immediately north of the “Five Sisters”, and two additional areas were identified.

The beach nourishment design effort includes numerical analyses of waves (using a wave refraction/diffraction model) and longshore sediment transport (using an Army Corps model called GENESIS). Various engineering alternatives and their effect on longshore sediment transport will be evaluated in this study. This evaluation will require modeling to determine the effect and longevity of the beach nourishment as well as the effect on adjacent shoreline areas.

The model will be utilized to predict the evolution of the beach fill and evaluate its design life based on wave conditions. The impact of the existing structures (e.g., the groins at Winthrop Shores) and other unique physical features (e.g., the tombolo (spit of sand) extending offshore to the “Five Sisters”) will be evaluated within the context of the model. Due to the existence of the groin field, beach nourishment design will consider modifications to the various structures to enhance the beach fill design life. In addition, an offshore borrow site analysis will be performed during the Spring/Summer 2000. This effort will focus on a NOMES sand and gravel resource site, approximately eight miles offshore of Winthrop.

