

# APPLIED COASTAL

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**Project:** Assessing Potential Environmental Impacts of Offshore Sand and Gravel Mining

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The Massachusetts Coastal Zone Management Office (MCZM) identified a need to explore the potential environmental impacts of offshore sand and gravel mining in Massachusetts Bay in response to the rising interest in offshore sand resources for beach nourishment. This project was designed to provide guidance to applicants seeking to implement beach nourishment projects with sand and gravel mined from offshore borrow sites, including site characterization, environmental impact analyses, and the regulatory process. Applied Coastal established a methodology to evaluate the types of information necessary to facilitate the application preparation and subsequent permitting decisions for offshore sand and gravel extraction.

The first goal of this project was to establish the regulatory framework for evaluating offshore sand and gravel extraction activities using the U.S. Army Corps of Engineers Highway Methodology as a model. Once beach nourishment is selected as the most viable shore protection alternative, a feasibility screening of potential borrow sites is performed. The screening process consists of the following steps: 1) select candidate sites; 2) characterize the existing physical, biological, and socioeconomic environment; 3) assess environmental impacts; 4) evaluate the potential for cumulative impacts 5) develop a protocol for mitigating and monitoring of significant environmental impacts 6) address federal and state permitting requirements.

To assist in the future identification of candidate borrow sites, Applied Coastal provided a general description of environmental concerns associated with sand and gravel mining in Massachusetts Bay. A

case study of the New England Offshore Environmental Study (NOMES) sand sites in Massachusetts Bay as a nourishment source for Winthrop Beach was provided to illustrate the borrow site screening process. The case study includes a brief overview of the shore protection alternatives for Winthrop Beach to establish the need for beach nourishment material. An initial screening of potential borrow sites was performed, based on physical properties of known NOMES borrow sites. As stipulated in the established regulatory framework, exclusionary and discretionary screening criteria were developed based on the physical properties of the borrow sites and economic restrictions of material transport. A more detailed evaluation of the NOMES Site I, ranked highest as a potential sand and gravel resource, was used to describe data needed to evaluate the potential impacts associated with the offshore sand and gravel mining for beach nourishment at Winthrop Beach.

