Environmental Studies Program: Ongoing Study

Field	Study Information
Title	New York Bight Fish, Fisheries, and Sand Features: In the Field (MM-20-01)
Administered by	Marine Minerals Program
BOEM Contact(s)	Deena Hansen (Deena.Hansen@boem.gov)
Procurement Type(s)	Cooperative Agreement
Conducting Organization(s)	Rutgers University
Total BOEM Cost	$1,089,530
Performance Period	FY 2021–2024
Final Report Due	September 2025
Date Revised	August 14, 2023
Problem	The benthic environment in the New York Bight (NYB), both physical and biological features, will be affected by potential dredging activities (expected in the near future); this in turn will affect fishermen if landings are impacted.
Intervention	Characterize the potential impacts to the natural environment and fisheries from habitat alteration that may result from dredging activity.
Comparison	This study includes a before-after-control-impact (BACI) design to compare changes to the environment due to dredging with natural environmental changes.
Outcome	We expect to improve the understanding of the NYB ecosystem, including sand features, benthic infauna, fish composition, and fisheries dependence across seasons and years to improve our National Environmental Policy Act (NEPA) analyses of impacts, as well as consultations that recommend mitigations.
Context	The study area would include potential sand resource areas under the Bureau of Ocean Energy Management's (BOEM's) jurisdiction (*i.e.*, >3 nm from shore) but no more than 50 m deep off of the NYB.

BOEM Information Need(s): Better understanding of demersal and benthic organisms' occurrence in and use of sand habitats in the Mid-Atlantic is important for BOEM's Marine Minerals Program (MMP) to inform and evaluate the use of potential sand borrow areas in federal waters. BOEM anticipates that dredging may occur at multiple sites in federal waters of the New York Bight (NYB; waters off of New Jersey and New York), in part to address the US Army Corps of Engineer's (USACE) projected sand deficiency for completing vital federally-authorized shore protection projects in the next 5 years. Since dredging on the NYB outer continental shelf (OCS) has been infrequent relative to other regions, research on biological activity, biophysical coupling, and geomorphology will complement the geophysical and geotechnical data, and strengthen NEPA analyses that consider the potential effects of dredging as well as inform consultations that recommend dredging mitigations.

Background: Limited information exists on the ecological function and biological significance of sand waves, ridges, swales, shoals, and other OCS features in the NYB, especially as it relates to dredge-

related disruptions. Dredging activities under BOEM's jurisdiction generally occurs from 3 to 9 nautical miles (nm) from shore. The NYB is inhabited by a diverse community of fishes and invertebrates, with both resident and transient species. Many of these species are economically important to commercial, recreational, and charter fishing industries. Additionally, strong seasonal fluctuations in abiotic factors are often linked to changes in biological diversity. Therefore, the potential effects of sand dredging on ecosystem health and fish and invertebrate communities may vary spatially and temporally.

Objectives: BOEM seeks to fill information gaps (see New York Bight: Data Review), particularly related to how ecologically and economically important fishes associate with sand shoals. Objectives also include characterizing disruption to fishes and habitats during a dredge event, and subsequent recovery.

The overarching hypotheses are that:

1. Stakeholder and partner involvement strengthens BOEM's understanding of NYB, as well as the approach to gather additional information.
2. Areas with sand features and relief have strong habitat associations for benthic invertebrate and fish species than flat areas with limited or no sand features.
3. Dredging results in physical and biological changes in the short-term, with faster ecological succession and recovery times with closer proximity to undisturbed areas.

Methods: Details of methodology were informed by results of the New York Bight: Data Review (MM-19-02). Surveys are performed in both spring and fall, including surveys before, during, and after dredging if feasible, covering at least two years. Features to monitor include seafloor morphology and substrate; biological assemblages; and water hydrology and chemistry. Organism distribution should be modeled with physical and chemical variables to identify correlations.

Specific Research Question(s):

- What can BOEM learn about OCS resources from NYB stakeholders and experts?
- How do benthic and demersal organisms occur and use NYB sand resources? How does this distribution, composition, and biomass change temporally? What factors influence this distribution?
- What are the effects (either theoretical or actual) of sand dredging on sand resources and associated?
- What strategies might minimize impacts to fish resources associated with sand resources in NYB?

Current Status: Sidescan sonar has been used at Brigantine Shoals to characterize sand and identify fishes. Trawling has also been used to understand seasonal fish composition.

Publications Completed: None

Affiliated WWW Sites: None

References: None