

TECHNICAL SUMMARY

Study Title: Critical Technical Review and Evaluation of MMS Site-Specific Studies Techniques

Report Title: Critical Technical Review and Evaluation of Site-Specific Studies Techniques for the MMS Marine Minerals Program

Contract Number: 01-06RQ39799

Sponsoring OCS Region: Headquarters– Marine Minerals Program

Applicable Planning Areas: East Coast, Gulf of Mexico, and Pacific Coast

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Costs: FY 2007: \$100,000

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Key Words: offshore sand and gravel, environmental studies, review, methodologies

Background: The Minerals Management Service (MMS) Marine Minerals Program is charged with environmentally responsible management of Federal Outer Continental Shelf (OCS) sand and gravel resources. MMS has a long history of conducting scientific assessments and studies that improve their understanding of the likely effects of offshore dredging and support decision making about how to best manage these resources. The primary purpose of MMS-funded site-specific environmental studies has been to address concerns raised by the potential for adverse environmental impacts on marine life as a consequence of dredging sand on the OCS. The study methods have not changed much in the last ten years.

Objectives: The project objectives were to review and evaluate the appropriateness of the MMS marine minerals site-specific studies conducted to date and determine if the current study designs and methods should be modified to yield information that may be more scientifically appropriate or provide a greater cost/benefit relative to the assessment of environmental impacts of offshore dredging operations on the biological and physical environments.

Description: In total, 22 studies and reports were reviewed by a scientific team consisting of experts in numerical modeling and coastal sediment transport, offshore dredging technology, benthic ecology, fisheries biology, and physical oceanography. Recommendations for new approaches to future studies were divided into general guidelines that would improve the study products and suggestions for the types of studies to be conducted in the future. General guidelines include:

- Improve the Scope of Work specified in the Request for Proposals to include key study questions whose answers will lead to an ability to minimize negative impacts of dredging, determine allowable actions, and improve predictions of impacts.
- Require better multi-disciplinary integration and collaboration during all phases of the study.
- Follow adaptive management principles as studies evolve, to reflect the current understanding or knowledge base. The goal is to limit the need for some routine types of monitoring of future projects.

- Require biophysical habitat mapping that will guide the design of any future physical or biological sampling, and development of environmentally and economically acceptable long-term dredging plans. Such biophysical mapping should be aimed at placing the site to be dredged in the context of the surroundings to ascertain if there are any unique aspects to the borrow site. If not, then the site-specific surveys may be performed at greatly reduced scope and cost since any loss can be quantified as a percentage of the surrounding area.
- Require recommendations for mitigation measures to test some of the hypotheses that have been proposed to minimize impacts on the benthos in the short- and long-term.
- Improve the understanding of the current patterns and morphologic response of dredged areas to provide input conditions for evaluation of geomorphic recovery processes (including rate and manner of infilling).

Future studies of offshore sand borrow sites should fall into three types, in order of priority:

- Characterization studies at all new sites to provide the baseline data needed to support environmental assessment for leasing. These studies would include biophysical habitat mapping, modeling of physical processes, limited biological sampling, and analysis of the results to support linking of biophysical relationship, development of recommended dredge plans and site-specific mitigation measures, and an understanding of the benthic recovery mechanisms for different dredging scenarios.
- Focused model studies at selected sites that are designed to answer key questions such as how the borrow sites respond to dredging events, what are acceptable levels of shoreline change, how ecologically unique or special are sand shoals as habitats for valuable benthic and fish resources, and how are bioenergetics changed after dredging events? These focused studies should use appropriate study methods and technologies to generate the data needed to provide definitive answers to these key questions.
- Long-term monitoring studies at selected sites to determine the long-term effectiveness of different mitigation measures and for assessment of cumulative impacts. Only through long-term monitoring will MMS be able to achieve its goal of environmentally sound management of these sand resources. MMS should be an active partner in Regional Coastal Ocean Observing Systems, sharing in the design, implementation, and costs of these multi-agency efforts to collect and distribute physical and biological data for coastal ecosystems.

Although the recommendations in this report have been developed for the MMS Marine Minerals Program, it is noted that most of these principles and approaches are directly applicable to other marine assessment studies. In particular, the MMS has new responsibilities over offshore renewable energy and related uses under the Energy Policy Act of 2005. MMS will have to conduct scientific assessments and studies to improve their understanding of the likely effects of offshore alternative energy projects and to support decision making for best management of resources. The recommendations made here should also assist MMS in the proper design and implementation of a research program to support alternative energy uses in the OCS.

Study Products: Michel, J., Nairn, R., Peterson, C.H., Ross, S.W., Weisberg, R. and Randall, R. 2007. Critical Technical Review and Evaluation of Site-Specific Studies Techniques for the MMS Marine Minerals Program. Minerals Management Service, MMS OCS Report 2007-047. 47 pp. + appendices.