BOEM
Bureau of Ocean Energy Management

OSC Scientific Committee Meeting
May 2013

Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations

Michael Miner and Geoffrey Wikel

BOEM
Bureau of Ocean Energy Management

Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations

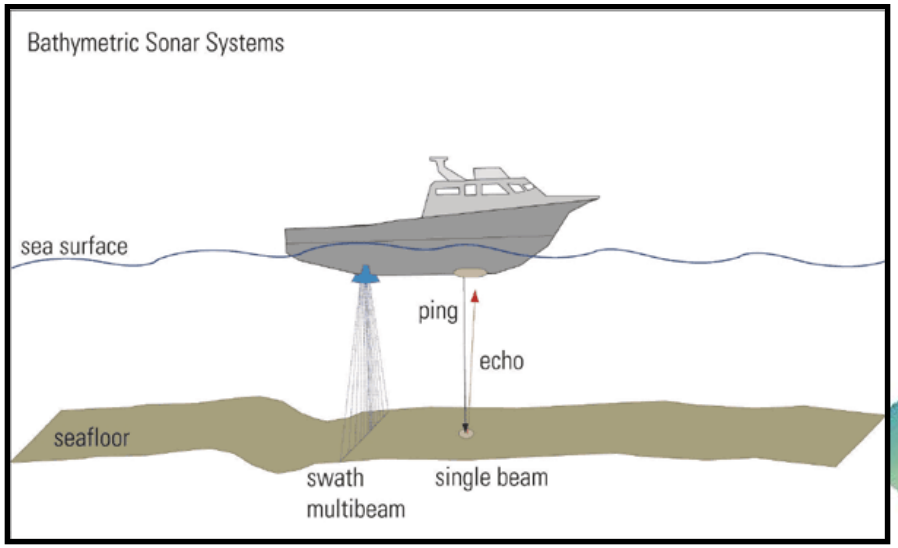
Page #	Break-out	Title	Rank
27		Topical and Functional Expansion of EcoSpatial Information Database	1
Paper		Evaluating the effectiveness of BOEM-imposed adaptive management of biological mitigation and monitoring requirements	
33		Developing BOEM's Access to Protected Species Occurrence Data for Impact Analyses and Rule-making	4
37		Variability in Ecosystem Service, Resiliency, and Post-Dredging Recovery of Ridge-Swale Habitat and Biological Communities in the Mid- and South-Atlantic Bight	6
41		**Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations**	**8**
43		Monitoring Dredging Intensity Using Variable Grid Analysis of Dredge Quality Management Data	9
45		Support for the Development of an Improved Biostatistical Method to Analyze and Interpret Observations from Marine Mammal Behavioral Response Studies	10

PO = Physical Oceanography FE = Fate & Effect BIO = Biology
PS = Protected Species SE = Social & Economic OT = Other

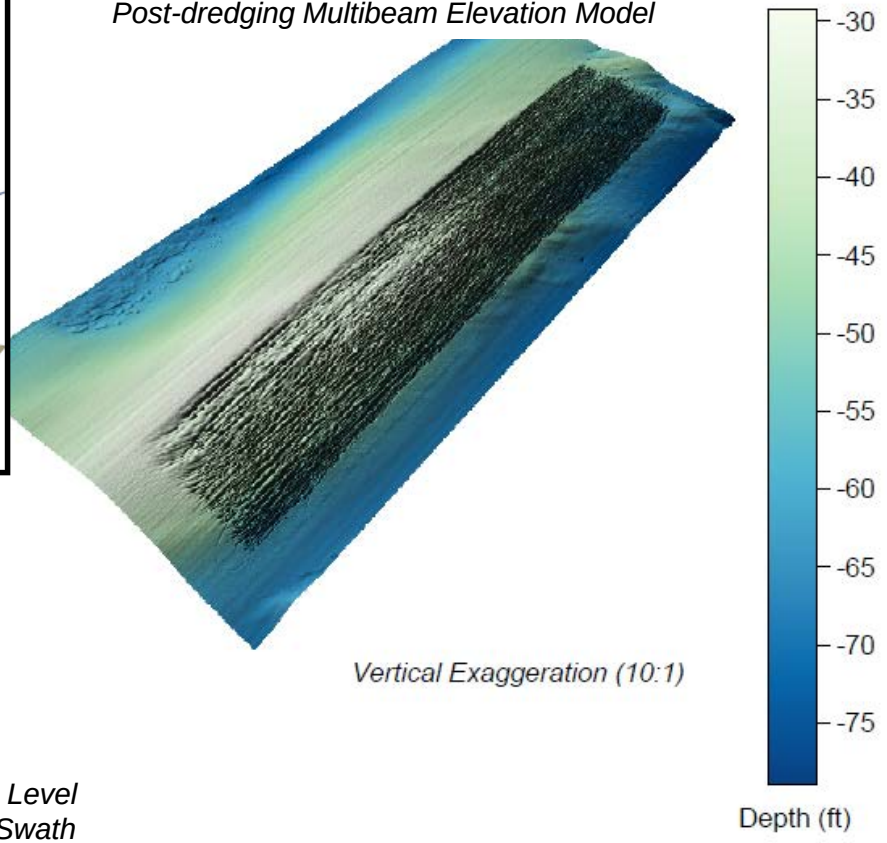
Headquarters

BOEM
Bureau of Ocean Energy Management

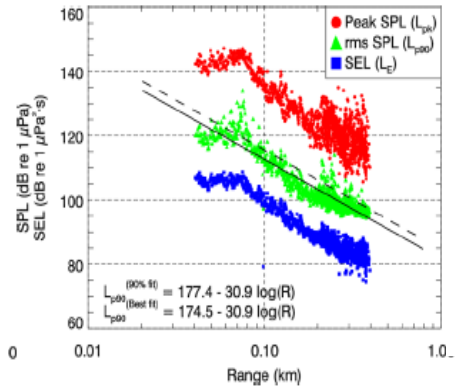
Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations



Post-dredging Multibeam Elevation Model



Vertical Exaggeration (10:1)



Sound Pressure Level
Interferometric Swath

Headquarters

Tentative Ranking: 8

BOEM
Bureau of Ocean Energy Management

Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations

BOEM Information Need:

1. What are the differences in environmental effects associated with echosounding sources, vessel platforms, deployment methods, and acquisition protocols?

2. What are the cost differences in mobilization, vessel support, acquisition and vertical control/motion/tide correction, post-processing, and data management for single beam, swath, and multi-beam data?

Date Information is Required:

Ongoing need for current and future projects

Headquarters **Tentative Ranking: 8**

BOEM
Bureau of Ocean Energy Management

Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations

Background:

A) Relationship with Previous Work/Efforts

Integrate with Atlantic G&G PEIS modeling results.

Integrate with existing sound source monitoring and other modeling results.

B) Relationship with Concurrent/Future Efforts

Integrate with GOM G&G PEIS modeling results.

Integrate with proposed sound source monitoring and validation studies.

Headquarters **Tentative Ranking: 8**

BOEM
Bureau of Ocean Energy Management

Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations

Study's Objectives:

1. Identify the principal differences in environmental effects associated with the use of different sources and survey methods.

2. Ascertain the differences in acquisition, correction, and processing cost.

Headquarters

Tentative Ranking: 8

BOEM
Bureau of Ocean Energy Management

Environmental Effects and Cost Comparison of Single Beam, Swath, and Multibeam Bathymetric Surveys Before and After Dredging Operations

Study's Methods:

1. Review literature, modeling results, monitoring data, and manufacturer data for different equipment types and deployment configurations.

2. Perform quantitative modeling of source level, peak frequency, received levels and area of ensonification, transmission loss. Sensitivity testing and validation.

3. Conduct structured surveys of equipment manufacturer.

4. Perform cost and/or cost effectiveness analyses.

Headquarters **Tentative Ranking: 8**