Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Documenting Historic Deep and Shallow Drill Splay: Improving Resource Guidance (GM-22-04)
Administered by	Gulf of America Regional Office
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Procurement Type(s)	Contract
Conducting Organization(s)	BOEM
Total BOEM Cost	$683,814.72
Performance Period	FY 2023–2026
Final Report Due	April 2026
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Problem	The spatial extent of oil and gas drilling impacts in the Gulf of Mexico is characterized by the analysis of three wells at similar water depths (CSA 2006). BOEM bases its avoidance mitigations for the protection of many benthic resources on this single study.
Intervention	Geophysical characterization of the seabed within the Area of Potential Effect associated with well drilling activities. Geological and geochemical analysis of the post-drilling sediment splay.
Comparison	Comparative analysis of drill splay characteristics in variable water depth, geophysical regimes, and ages.
Outcome	Development of a more accurate and precise representation of drilling impacts from sediment splay over time that will improve impact analysis and the application of appropriate mitigation strategies.
Context	Drilling sites in shallow (<300 m) and deepwater (>300 m) applicable to future forecasted Gulf of Mexico drilling locations.

BOEM Information Need(s): Understanding the impacts of OCS activity on benthic resources is paramount to environmentally responsible development of oil and gas. This study will examine seabed disturbance from drilling activities which may cause impacts to biological resources (e.g., coral, benthic fish species, chemosynthetic communities, and other benthic habitats), cultural resources (e.g., shipwrecks) and protected and regulated resources (e.g., endangered species and Essential Fish Habitat). BOEM has relied on limited and dated studies (CSA 2006; NRC 1983; Neff 2005; Enright et al., 2006) to determine the current minimum distance(s) necessary to avoid impacts to biologically sensitive areas and archaeological resources.

BOEM is responsible for documenting routine impacts as part of its environmental compliance practices under the National Environmental Policy Act (NEPA), Magnuson-Stevens Act, and OCS Lands Act. This study will examine multiple impact-producing factors (e.g., drilling muds and cuttings, produced water contaminants in sediment, seabed disturbance) and their potential impact on biological and cultural

resources, and how this impact may evolve over time. The result will satisfy information needs on drilling disturbance for NEPA analysis and inform an evaluation on current avoidance buffers for post-lease activity.

Background: Bottom-disturbing operations can damage benthic biological and archaeological resources on or near the seabed. Biologically sensitive communities may be smothered or exposed to toxins and archaeological resources may be damaged. BOEM provides guidance to operators for the avoidance and protection of biologically sensitive features and archaeological resources. Lease stipulations and other appropriate mitigations to avoid and protect such habitats have been made a part of OCS oil and gas leasing since 1973. BOEM's experience with offshore development, supplemented by independent studies such as CSA (2006), Austin et al. (2004), and DeBlois et al. (2014), serve as a basis for current benthic impact mitigations as described in guidance provided in Notices to Lessees & Operators. However, the efficacy of BOEM's mitigations regarding bottom impacts has not been rigorously evaluated in the Gulf of Mexico since 2006 (CSA 2006). A universal analysis of the potential seafloor impacts from drilling is needed to ensure environmentally responsible development of the OCS.

Objectives: The primary objectives of this study are the following:

1. Assess the spatial extent of impact from drilling
2. Compare the impact distance of drilling at sites of differing water depth and seafloor characteristics
3. Compare the potential variation in seafloor impacts as drilling splays age
4. Evaluate current stipulations and mitigations and provide recommendations to management on best practices regarding bottom-disturbing activities

Methods: CSA (2006) sampled drilling sites in 1,000 to 1,125 m water depth. This study will target completed drilled well sites, including those plugged and abandoned, of differing ages (~2, ~5, and ~10 years) in shallow, shelf water (<200 m), and deep (<300 m) water for up to 10 wells. Wells for which minimal activities have occurred within the sediment splay (platform/pipeline installation, anchoring, etc.) will be prioritized.

Selected well sites will be surveyed and comparison of geophysical seabed data (multibeam bathymetry, side scan sonar, sub-bottom profiler) will allow BOEM to determine the vertical and horizontal extent of drill splay compared to the surrounding sediments. Current meters will be deployed during survey operations.

Gravity cores will be collected within the drill splay to provide an assessment of vertical accumulation and to characterize the deposited muds and cuttings. Coring locations will be determined using results of the geophysical survey. Four cores will be collected along a single transect along the radius of the maximum drill splay starting at 1,000' minimum distance from the drill site. A fifth, 'control' core will be taken outside of the splay at the edge of the survey area. Potential target analyses on the sediment cores include sediment type, grain size, heavy metals, trace metals, hydrocarbon compounds, and TENORMS.

Specific Research Question(s):

1. How do seafloor impacts from drill splay vary with distance from drills sites and water depth?

2. How do seafloor impacts from drill splay vary with time at the drill sites at different water depths?
3. Are BOEM's current avoidance guidelines for well site surface locations sufficient to mitigate impacts to biological and archaeological resources? How should avoidance guidelines be revised to take into account water depth, hydrological regime, etc.

Current Status: All field work (i.e., research cruise) has been completed. Subsequent geophysical data processing and sediment chemistry analyses have also been completed. The final study report is being drafted.

Publications Completed: None

Affiliated WWW Sites: None

References:

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