

## Environmental Studies Program: Studies Development Plan | FY 2022–2023

Title	Reevaluating BOEM’s Guidelines for Identifying Submerged Pre-Contact Archaeological Sites in the Gulf of Mexico (GM-22-05)
Administered by	Gulf of Mexico Regional Office
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Procurement Type(s)	Cooperative Agreement (potentially through the Gulf Coast CESU)
Conducting Organization(s)	TBD
Total BOEM Cost	TBD
Performance Period	FY 2022–2027
Final Report Due	2027
Date Revised	January 27, 2021
PICOC Summary	
<i><u>Problem</u></i>	Submerged pre-contact sites on the OCS are difficult to identify and confirm using traditional mapping technologies and BOEM’s current survey guidelines. BOEM errs on the side of caution by assigning avoidance mitigations to potential, but unconfirmed, paleolandscapes that may or may not actually contain preserved archaeological features. This results in avoidance of areas that may not actually warrant exclusion from OCS activities across BOEM’s three program areas. Additionally, the identification and preservation of pre-contact cultural resources are frequently cited as priorities by Native American tribes in BOEM’s government-to-government consultations.
<i><u>Intervention</u></i>	Develop updated paleolandscape reconstructions for selected areas of the GOM and test a survey methodology(ies) to better delineate submerged paleolandforms potentially containing preserved archaeological remains.
<i><u>Comparison</u></i>	Conduct geophysical surveys, collect sediment and other appropriate samples, and investigate potential sites to compare and contrast the effectiveness of a revised survey and testing methodology in geologically distinct areas: the Western GOM and Eastern GOM, at a minimum.
<i><u>Outcome</u></i>	Updated paleolandscape reconstructions of selected study areas. A revised methodology(ies) is needed, potentially utilizing modern state-of-the-art technology or innovative use of existing technology, to better identify preserved paleolandscapes and potential archaeological sites for avoidance, update existing survey guidelines, and allow BOEM to design more effective archaeological mitigations to better balance OCS resource development with protection of non-renewable submerged pre-contact cultural resources. Study results will also inform and facilitate meaningful Tribal consultations.
<i><u>Context</u></i>	Western GOM, Central GOM, Eastern GOM

**BOEM Information Need(s):** BOEM is required to consider the potential effects of its activities on cultural resources per the National Historic Preservation Act (NHPA) of 1966, OCS Lands Act of 1953, and National Environmental Policy Act (NEPA) of 1969. For conventional energy development in the GOM,

BOEM currently requires geophysical survey line spacing of 300 m in water depths less than 60 m using traditional Chirp sub-bottom profiling systems to identify potentially preserved submerged paleolandscapes. These tentatively identified paleolandscapes *may* contain preserved landforms and features that could have supported human populations when the OCS was subaerially exposed during the Last Glacial Maximum, but these areas are not required to be investigated to confirm their nature or to determine their spatial extent. As a result of this incomplete information, BOEM archaeologists prescribe avoidances as conditions of permit approval to ensure that no potential archaeological resources will be impacted by the proposed activity. However, these avoidances may be prescribed in areas that do not actually contain preserved paleolandforms or archaeological remains, or were misidentified due to inconsistencies in geophysical data interpretation and paleolandform identification nomenclature (see Heinrich et al. 2020), thereby unnecessarily reducing the area available for industry activities. Updated paleolandscape reconstructions (modeling that integrates past environmental conditions, geological processes, local sea level history, regional human settlement patterns and culture history, and geophysical/geotechnical data) are necessary to identify areas of the GOM more likely to contain preserved submerged landforms. In addition, BOEM requires an assessment of, and suggested revisions to, its existing survey guidelines and prescribed methodologies to better identify submerged paleolandforms that may support preservation of pre-contact archaeological remains. This information will be used to design more effective avoidance mitigations and better delineate potentially preserved landform features and archaeological remains while increasing the availability of OCS lands for conventional and renewable energy development and marine minerals utilization. State-of-the-art advances in sub-bottom acoustic technologies, paleolandscape reconstructions, and survey methodologies have been made in the 16 years since the issuance of NTL 2005-G07. Incorporating these recent advancements into revised and updated survey guidelines will better inform BOEM's archaeological avoidance mitigations and resource management responsibilities, which will further inform BOEM's government-to-government consultation responsibilities with Native American tribes under E.O. 13175, S.O. 3317, and the DOI Policy on Consultation with Indian Tribes. While the study focuses on the GOM, study results, including a revised methodology or methodologies based on empirical data and field testing, will inform all three program areas and the other BOEM regions.

**Background:** Several confirmed and more than a dozen potential submerged pre-contact sites have been identified by archaeologists off the northeastern Gulf coast of Florida since the 1980s, yet none have been positively identified in the northwestern GOM to date (Faught 2004, Evans 2012). In 2016, the preserved remains of a freshwater pond containing 8,000-year-old human burials was discovered eroding from the seafloor in state waters off the coast of Manasota Key (MKO), southwest Florida (Florida DOS 2020). The site is currently being investigated by the State of Florida and BOEM to determine why it exhibits such remarkable preservation in the marine environment and survived marine transgression during sea level rise. Under BOEM's existing survey guidelines for identifying potential submerged pre-contact sites—300-m survey line spacing—the site likely would not have been detected. In addition, a geophysical survey conducted after the site was discovered using a traditional Chirp sub-bottom profiler did *not* sufficiently resolve the intact strata containing the burials or independently provide evidence that archaeological features were present. The ongoing study at MKO (M19AC00014) conducted a new survey in 2019 utilizing a parametric sub-bottom profiling system to collect high-resolution acoustic data at 1-m line spacing. Using that dataset, data from various survey line increments (e.g., every 10-m, 20-m, 30-m, etc.) are being reanalyzed to determine the widest line spacing at which the known site and its preserved intact (e.g., undisturbed) strata can be sufficiently resolved for a BOEM archaeologist to recommend avoidance. Results from the MKO study will inform this proposed follow-up BOEM study to determine if revisions to BOEM's current prescribed survey

methodologies can better identify and delineate submerged paleolandscapes with a high probability to support preserved archaeological remains in other areas of the GOM.

**Objectives:**

1. Develop updated/refined regional paleolandscape reconstructions to identify areas with a higher preservation potential for pre-contact archaeological remains.
2. Design, test the efficacy of, and compare results from a revised survey methodology(ies) conducted in geologically distinct areas of the GOM to recommend best practices to better detect and delineate preserved paleolandforms and assess their likelihood of containing archaeological materials.
3. Recommend a more effective methodology(ies) and revisions to BOEM's current survey guidelines for submerged paleolandscapes in the Gulf of Mexico Region.

**Methods:**

- Assess the currently available data and known/potential site locations for submerged pre-contact sites in the GOM and compile a geospatial database including preservation potential (and lack of potential), estimated age of landforms, depth of burial, and other pertinent information.
- Conduct geophysical surveys and investigations of identified potential submerged archaeological features in geologically and environmentally distinct areas in the northern GOM for a comparative analysis of methodologies: at a minimum, areas in the Eastern GOM and Western GOM.
- Ground-truth high-potential targets to determine their age, nature, and extent.
- Collect sediment samples and conduct appropriate analyses for paleoenvironmental reconstructions.

**Specific Research Question(s):**

1. What revisions to BOEM's current survey guidelines and recommended methodologies will better detect and delineate preserved paleolandforms likely to contain archaeological materials?
2. Which areas of the GOM are more likely to contain preserved paleolandforms with the potential for archaeological features/materials?

**Current Status:** N/A

**Publications Completed:** N/A

**Affiliated WWW Sites:** N/A

**References:**

Evans A. 2012. Out of Site but Not Out of Mind: Submerged Prehistoric Landscapes on the Northwestern Gulf of Mexico Outer Continental Shelf. PhD Dissertation. Louisiana State University, Baton Rouge, LA.

Faught M. 2004. The Underwater Archaeology of Paleolandscapes, Apalachee Bay, Florida. *American Antiquity* 69(2):275–289.

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Heinrich PV, Miner M, Paulsell R, McCulloh RP. 2020. Response of Late Quarternary Valley Systems to Holocene Sea Level Rise on Continental Shelf Offshore Louisiana: Preservation Potential of Paleolandscapes. Louisiana State University. Baton Rouge, LA. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, OCS Study BOEM 2020-004.  
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