

BOEM ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Gulf of Mexico, OCS

Planning Area(s): Central

Title: Testing and Assessment of the Effects of an Oil Spill on Coastal Archaeological Sites (GM-14-04)

Total Cost: \$ 322,321

Period of Performance: FY 2014-FY 2017

Conducting Organization: University of Louisiana at Lafayette

BOEM Contact: Scott Sorset

Description:

Background: As a result of the cultural resources investigations conducted during the Macondo spill, Spill Clean-up Assessment Team (SCAT) archaeologists surveyed more than 5,000 kilometers of shoreline in the states of Louisiana, Mississippi, Alabama, and Florida (HDR, 2011). The investigations identified 32 previously recorded and 45 newly recorded sites that exhibited signs of oiling; 18 of the previously recorded and 31 of the newly recorded sites (61%) are located in Louisiana. Nearly all of the prehistoric sites effected by the Macondo spill are located in Louisiana; mostly in and around the Mississippi Delta and Barataria Bay in Iberia, Plaquemines, Jefferson, Lafourche, St. Bernard, and Terrebonne parishes. The Louisiana State Historic Preservation Office maintains records of all reported archaeological sites discovered during site assessment and clean-up efforts in the wake of the DWH oil spill in 2010. BOEM uses this data in the NEPA documents to estimate the potential effects of coastal oil spills for a specific proposed action. While site monitoring and remediation associated with the DWH spill response has documented the presence of oil at many sites, there has been no systematic attempt to assess the effects on archaeological resources, formation processes, or conservation. Restoration of coastal landscapes and ecosystems will further impact archaeological sites, making these finite cultural resources endangered features of an increasingly-altered environment. Previously, the only data on which to base assumptions regarding the effects of a major oil spill on archaeological resources was derived from the Exxon Valdez spill in Alaska in 1989, which is not an analogous environment to the Gulf Coast. By undertaking this study now, the characteristics of coastal oil spills will serve as a baseline to which future effects can be compared. BOEM would be better able to respond to questions about the effects of oil spills on archaeological resources with this study.

Objectives: The goals of this project are to assess the effects of oil on prehistoric cultural resources on southeastern Louisiana dating from the Late Woodland and Mississippi periods (ca. A.D. 700-1700). Sites to be investigated and assessed will be selected from those previously recorded as potentially eligible for listing on the National Register of Historic Places and impacted by the 2010 oil spill. These sites have produced evidence for Bayou Petre phase Mississippian ceramics, as well as local Coles Creek and Plaquemine material culture. Additional previously unknown sites documented by shoreline assessment teams will be considered for investigation.

Methods: Means should be developed to assess impacts to prehistoric sites from oiling in terms of site preservation, effects to radio-carbon dating, and implications for research costs. Application of archaeometric techniques such as neutron activation analysis and absorbed residue analysis will examine the effects of oil and other contaminants in the archaeological record. In addition, analysis should be conducted to determine if the oil present at the sites can be fingerprinted to a source after the passage of time. In order to address issues of importance to the Louisiana Division of Archaeology, neutron activation analysis and accelerator mass spectrometry will complement ceramic and lithic analyses in providing a more precise chronology of regional culture history and extra-regional interactions. Field methods will consist of systematic surface collection, mechanized and hand-operated coring and augering, and excavation of 1-by-1-meter test units in up to five (5) previously recorded sites to record stratigraphic profiles and obtain well-provenienced archaeological samples. Excavations will further examine the effects of oil on taphonomic and site formation processes, generating recommendations for site remediation, resource management, and archaeological conservation. The study is a cooperative agreement with the University of Louisiana at Lafayette (ULL), a member institution of the Gulf Coast Cooperative Ecosystem Studies Unit (GCCESU). ULL, located in southern Louisiana, provides the necessary regional archaeological expertise to accomplish the goals of the project.

Products: Presentations on Progress and Findings at Professional Conferences; Publication(s) in Peer-Reviewed Journals; Technical Summary; Final Report: including data, images, and analyses; Power Point Presentation; Public Outreach Materials for BOEM Website.

Importance to BOEM: The mission of BOEM's Environmental Studies Program is to provide the information needed to predict, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments as charged to the Secretary of the Interior by the Outer Continental Shelf Lands Act (OCSLA). Section 1346 of OCSLA mandates that the Secretary shall "...plan and carry out such duties in full cooperation with affected states." Thus, section 1346 of OCSLA authorizes the use of cooperative agreements with affected states to meet the requirements of the OCSLA, including the sharing of information and joint utilization of available expertise.

The proposed research will determine both immediate and long-term impacts on Louisiana's prehistoric cultural resources and archaeological sites in the coastal zone from the Deepwater Horizon Spill (DWH). Specifically it will determine if damage might include loss of radiocarbon-dating potential, impacts from cleanup operations, and if any looting took place after the spill. In addition the research will ascertain the possibility of fingerprinting the source of oil found on the site. Nearly all of the prehistoric sites known to have been affected by the DWH spill are located in Louisiana, but the results of these findings are important to the entire Gulf coast.

University of Louisiana at Lafayette (ULL), as a public university of an affected state, is uniquely qualified to carry out the research of this proposed project due to its vested interest in the welfare of the Gulf Coast, expertise in both the local and southeastern archaeological resources, current research activities, excellent laboratory facilities, and a long history of

publications and activity within the local and southeastern archaeology community. In particular, the Chair of the Department of Sociology and Anthropology, Dr. Mark A. Rees has a long history of both working within the region and on the types and periods of sites found within coastal Louisiana making ULL uniquely qualified to document impacts and changes on these coastal sites. With both the experience and connections of the scientists at ULL and BOEM, this project can document key information gaps. In addition, it is important to note that ULL is a member of the Gulf Coast Coastal Cooperative Ecosystem Studies Unit (GCCESU). This Gulf Coast Studies Unit facilitates collaborative research, education and technical assistance pertaining to the human and natural environment, within and beyond the region, among federal and state agencies, universities and non-governmental organizations.

Current Status: Ongoing

Final Report Due: June 30, 2018

Publications: Forthcoming

Affiliated WWW Sites:

<http://soci-anth.louisiana.edu/>

<http://www.crt.state.la.us/archaeology/>

Revised Date: January 2015

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