Environmental Studies Program: Ongoing Study

Title	Assessing Temporal and Spatial Variability in Community and Parish Level Responses to Oil Spills and Other Events in Coastal Louisiana (GM-16-03)
Administered by	GOM OCS Region
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Procurement Type(s)	Cooperative Agreement
Conducting Organization(s)	The Water Institute of the Gulf Bureau of Applied Research in Anthropology, University of Arizona
Total BOEM Cost	$550,000
Performance Period	FY 2016–2021
Final Report Due	August 30, 2021
Date Revised	August 10, 2021
PICOC Summary	
Problem	BOEM needs a better understanding of the cumulative socioeconomic impacts of hazardous events and trends in the in the Gulf coast region
Intervention	A multidisciplinary study combining quantitative and qualitative methods and statistical analyses.
Comparison	N/A
Outcome	A multidisciplinary study combining quantitative and qualitative methods and statistical analyses.
Context	Coastal and near-coastal parishes and communities in Louisiana.

BOEM Information Need(s): This study addresses three information needs. First is the question of the cumulative socioeconomic effects of outer continental shelf (OCS) activities in the Gulf of Mexico Region (GOMR). The Council on Environmental Quality (CEQ) has issued guidance for considering cumulative effects of particular actions on human communities under the National Environmental Policy Act (NEPA). According to CEQ, a cumulative analysis must take into account those activities that occur prior to the initiation of any proposed action as well as those that occur after the proposed action is completed. Such guidance has proven particularly difficult to implement in the GOMR given the scale and complexity of the OCS-related industry, which includes a diverse array of upstream and downstream support industries and infrastructure. A determination of the cumulative effects of OCS activities must also account for distinctive variations in the physical, economic, and social geography of the region, as well as historical trends in population migration, to effectively determine the influence of the industry on human communities. Coastal and near-coastal Louisiana is the core area for the socioeconomic consequences of OCS development. This research effort will establish, for this core area, a broad range of socioeconomic trends and their interactions as envisioned by CEQ guidance. In so doing, it will develop a methodology that could be applied across the coast. Second, by addressing cumulative effects, this study will also update Gulf information used to support GOMR baseline socioeconomic assessments. Third, the analysis of oil spill impacts, in particular the Deepwater Horizon oil spill, will support GOMR oil spill and “worst case” assessments.

Background: Social change is often the result of constant, incremental adjustments to technological, societal, economic, and environmental stressors, but it often happens rapidly after man-made (e.g., oil spills) and natural (e.g., hurricanes, floods) shocks. The general theories relating to human adaptation to disruptive events suggest that single factor explanations of human responses tend to exaggerate existing social-economic trends, and that the analysis of multiple, combined factors, is necessary to explain social responses. Such complexity is a major finding of the BOEM 2014 socioeconomic study of the Deepwater Horizon oil spill (BOEM 2014-614/615). Even when quantitative analysis finds similar patterns in the data for several communities or finds that similar communities have been able to recover from the same exogenous shock, this quantitative analysis does not necessarily show that the same processes are causing the same observed outcomes. More than one process can create the same pattern just as multiple interacting processes can do the same. Further, spurious relationships with no causative explanation may exist between an observed pattern and various unrelated processes. Thus, one observation is often wrong; a simultaneous analysis of multiple sources is more empirically grounded.

Objectives: The overarching objective is to assess cumulative and acute socioeconomic impacts of events and trends on Louisiana's coastal and near coastal communities and parishes. To accomplish this, the following objectives will be addressed:

- Enhance understandings of the socioeconomic effects of major disruptive events (e.g., oil spills, hurricanes, floods and droughts) on communities in the short- and long-term and to understand the cumulative effects of such events on communities.
- Evaluate the descriptive and predictive utility of selected sets of socioeconomic and environmental indicators used to identify demographic and socioeconomic change at varying spatial and temporal scales, and the utility of selected sets of measures to aggregate communities (parishes) into larger units.
- Enhance understanding of the spatial and temporal trends that characterize the cumulative socioeconomic impacts of the OCS industry.
- Enhance BOEM's educational outreach capabilities particularly as related to social and environmental change in coastal Louisiana.

Methods: The study will address socioeconomic changes in 39 coastal shoreline and coastal watershed Louisiana parishes (as identified by the National Oceanic & Atmospheric Administration [NOAA]) and the communities contained within these parishes, from 1950–2015, emphasizing the period from 1970 and beyond because of the availability of high quality quantitative and qualitative data for this time. As noted, a multi-method analysis is necessary to provide causative explanations for observed patterns in the data. The proposed approach can be likened to a police investigation. The research team consists of three groups: secondary data collection and analysis (forensics), field data collection and analysis (detectives), and oversight (police chief). BOEM serves in the last capacity since no study effort can follow all possible leads. The research team will collaboratively conduct an extensive literature review within the first year and utilize a science- traditional ecological knowledge (Sci-TEK) analysis framework to synthesize the historical data and field data within a geographic information system (GIS) environment during the second year. The third year is for writing and report review.

Geo-statistical data analysis will identify temporal and spatial clusters of socioeconomic change and will build on an already assembled wide range of socioeconomic (e.g., demographic, social, health, economic, physical/infrastructural) and environmental (e.g., oil spills, floods, droughts, land loss) data

that characterize coastal and near coastal communities and parishes from 1950 t0 2015. Additional data will be collected from a variety of sources, such as the U.S. Census of Population and Housing, the U.S. Census of Agriculture, NOAA Regional Climate Centers weather records, and the U.S. Coast Guard National Response Center oil spill records. Additional data on the development of oil and gas infrastructure in coastal Louisiana, will be collected through permit records kept by the U.S. Environmental Protection Agency, state permitting agencies, and archival records, as well as reports located in government repositories and state archives.

Additional data analysis will look at the interactive effects of multiple events and individual events within the context of preexisting trends to avoid overstating the effects of single events on observed social changes. The investigators will use a geo-statistical approach in GIS and will employ both linear and non-linear data analyses that exist over time and space. Primary data collected from field investigations will be used to ground truth the results of the geo-statistical analysis.

The primary data collected and analyzed by the field scientists will also provide context and direction for the overall study. For example, data from field research will inform the development of hypotheses early in the study. As the research progresses the field analysis will provide 1) general information necessary to interpret data (e.g., supplementing published community information); 2) additional detail on subjects identified by the secondary data analysis; and 3) possibly important subjects not identified by data analysis. For example, the group will work with community partners, members of populations under discussion (e.g., shrimpers), and/or local experts (e.g., local unofficial historians) to identify additional information and confirm findings. Qualitative data gathered will also be used to modify and weight the quantitative data models.

In addition to producing a final report, GIS database, and maps, the study deliverables will culminate in a public display, hopefully permanent, in a museum, that includes visual exhibits of the changes in land use and social use over the last several decades.

Specific Research Question(s): For Louisiana's coastal and near-coastal parishes, what are the cumulative socioeconomic impacts of hazardous events (e.g., oil spills, flooding, and hurricanes, etc.) and trends (e.g., economic, demographic, etc.)?

Current Status: Completion of final deliverables are in process.

Publications Completed: N/A

Affiliated WWW Sites: https://marinecadastre.gov/espis/#/search/study/100160

References:

Austin, Diane; Marks, B.; McClain, K., McGuire, T., McMahan, B., Phaneuf, V., Prakash, P., Rogers, B., Ware, C., Whalen, J. 2014. Offshore oil and Deepwater Horizon: Social Effects on Gulf Coast Communities, Volume I. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2014-617. 266 pp.

Austin, Diane; Dosemagen, S., Marks, B.; McGuire, T., Prakash, P., Rogers, B. 2014. Offshore oil and Deepwater Horizon: Social Effects on Gulf Coast Communities, Volume II. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2014-618. 205 pp.