Bureau of Ocean Energy Management | Environmental Studies Program

Quarterly Report FY 2017 Fourth Quarter

Latest Reports and Study Profiles Posted to the Environmental Studies Program Information System (ESPIS)

BOEM
Bureau of Ocean Energy Management

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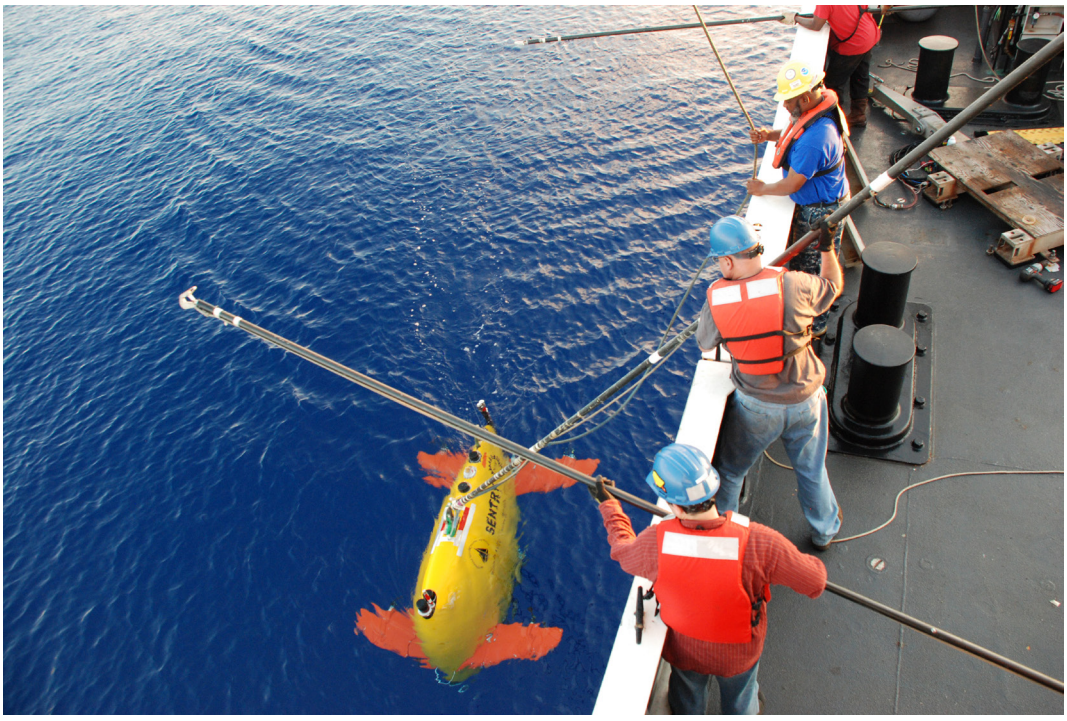
Contents

During the fourth quarter of fiscal year (FY) 2017, BOEM posted new findings from three studies to the Environmental Studies Program Information System (ESPIS). Below are report titles, summaries of the findings, links to documents, and related peer-reviewed journal articles.

Visit ESPIS at https://marinecadastre.gov/espis/#/.



During the first expedition for the DEEP SEARCH study in September 2017, members of the *Sentry* engineering team and the *Pisces* deck crew work together to hook the crane line to the *Sentry* and begin lifting the vehicle back onto the deck.
Image courtesy of DEEP SEARCH 2017, NOAA-OER/BOEM/USGS

Remote Sensing Assessment of Surface Oil Transport and Fate During Spills in the Gulf of Mexico

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/100036
Conducted by: Florida State University, University of South Florida, and the Norwegian Technical and Industrial Research Institute, 2012–2017
National Studies List: GM-12-02

Purpose: To help fill gaps in BOEM's understanding of the mechanisms controlling surface oil movement during spills, particularly at small spatial scales.

Findings

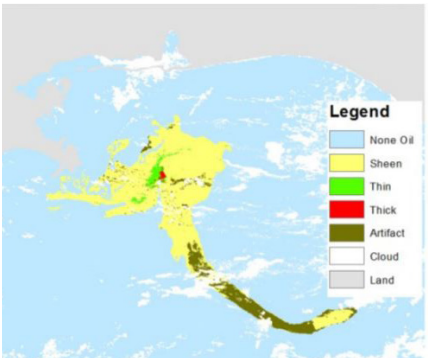
- The study developed improved remote sensing methods for detecting floating oil and understanding of the influences of environmental factors, such as wind and currents, that spread and dissipate surface slicks.
- Structure of the near-surface velocity profile and the related dynamics remain a fundamental knowledge gap for simulating surface oil transport.
- It was not clear how the fate of the oil released during the Deepwater Horizon spill would have been different had the event happened during the winter with colder temperatures and less shortwave (solar) radiation.
- The study recommended using two-way coupled ocean-wave-atmosphere models to examine the importance of this coupling in assessing flow transport. Preliminary work suggests that this coupling has non-negligible impacts.

Study Products

MacDonald I.R., D. Dukhovskoy, M. Bourassa, S. Morey, O. Garcia-Pineda, Daneshgar Asl, S. C. Hu, M. Reed, and J. Skancke. 2017. Remote Sensing Assessment of Surface Oil Transport and Fate During Spills in the Gulf of Mexico. US Dept. of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico Region, New Orleans, LA. OCS Study BOEM 2017-030. 129 p.

More than 20 peer-reviewed papers published or submitted, and used in more than 25 presentations at professional meetings

Gulf of Mexico surface oil classes: sheen, thin, and thick (May 10, 2010)



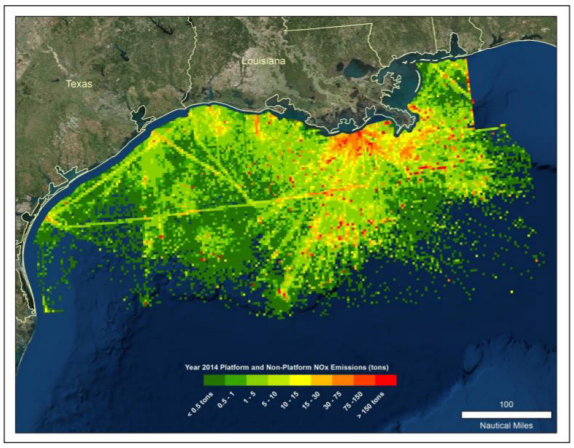
How BOEM Will Use This Information

- Improve oil spill risk analysis
- Fill gaps in understanding of the mechanisms controlling surface oil movement during oil spills in the Gulf of Mexico
- Use the results of weathering and advection models to track oil spills and to investigate natural seeps in the Gulf of Mexico
- Continue research on potential ecological impact and numerical assessment of oceanographic forcing factors that affect the advection of surface oil, defined as the horizontal movement of a mass of fluid

Year 2014 Gulfwide Emissions Inventory Study

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/100209
Conducted by: Eastern Research Group (ERG), 2014
National Studies List: GM-13-02

2014 platform and non-platform NOx emissions



Purpose:

- To calculate a calendar year 2014 emissions inventory for oil and gas exploration, development, and production sources in the Eastern, Central, and Western Planning Areas of the Gulf of Mexico on the Outer Continental Shelf (OCS)
- To inventory the following pollutants: carbon monoxide (CO), lead (Pb), nitrogen oxides (NOx), sulfur dioxide (SO_2), particulate matter-10 (PM_{10}), particulate matter-2.5 ($PM_{2.5}$), ammonia (NH_3), volatile organic compounds (VOCs), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and appropriate hazardous air pollutants (HAPs)

Findings

- OCS oil and gas sources accounted for the following emissions in the 2014 inventory: 99% of total CH_4, 72% of CO, 56% of VOCs, 36% of NOx, 30% of PM, and 12% of SO_2.
- OCS oil and gas sources showed a decrease in all emission estimates between 2011 and 2014: 73% decrease in SO_2, 68% decrease in PM, 60% decrease in NOx, and 17% decrease in CH_4 emissions in 2014, mainly due to the use of the automatic identification system to calculate vessel emissions.
- A detailed emission trends analysis of BOEM inventories prepared for calendar years 2000 through 2014 suggested that emissions are largely affected by three factors: activity and production levels, changes in inventory methodologies, and improvements in available emission factors.

How BOEM Will Use This Information

- To assess OCS oil and gas activities impacts to the states as mandated by OCSLA
- To comply with the Congressional mandate to coordinate air pollution control regulations between OCS and states' onshore sources

Study Products

Wilson D., R. Billings, R. Chang, S. Enoch, B. Do, H. Perez, and J. Sellers. 2017. Year 2014 Gulfwide Emissions Inventory Study. US Dept. of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2017-044. 275 p.

Wilson D. and B. Boyer. 2014. User's Guide for the 2014 Gulfwide Offshore Activities Data System (GOADS-2014). U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2014-606.

Maritime Cultural Resources Site Assessment in the Main Hawaiian Islands

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/26971
Conducted by: National Oceanic and Atmospheric Administration, 2013–2017
National Studies List: PC-13-01

Purpose:

- To develop an in-house geo-referenced database of known, reported, and potential submerged cultural resources on the OCS of the Main Hawaiian Islands, emphasizing the use of primary sources
- To identify significant Native Hawaiian cultural viewsheds between selected properties on the islands, and other important traditional cultural properties
- To identify best practices for working with Native Hawaiian communities

Findings:

- *The Unseen Landscape: Inventory and Assessment of Submerged Cultural Resources in Hawai`i* provides a thorough cultural, environmental, and historical context to the inventory of known, reported, and potential submerged resources.
- *A 'Ikena I Kai (Seaward Viewsheds): Inventory of Terrestrial Properties for Assessment of Marine Viewsheds on the Main Eight Hawaiian Islands* offers a new paradigm to understand the marine viewsheds of 190 historic sites and a new baseline to assess potential visual impacts from renewable energy projects.
- *A Guidance Document for Characterizing Native Hawaiian Culture Landscapes* offers guidance that Native Hawaiian communities can use to recognize and record areas of cultural importance and to identify significant areas that need to be proactively considered during the offshore wind planning processes.

A traditional Hawaiian sailing canoe (Source: Honolulu Star Bulletin)

How BOEM Will Use This Information

- Use the database as a resource management tool
- Apply the National Register Criteria from the National Historic Preservation Act to properties that may be affected by a federal undertaking
- Support reviews under the National Historic Preservation Act, the National Environmental Policy Act, and other federal laws

Study Products

NOAA Maritime Heritage Program. 2017. The Unseen Landscape: Inventory and Assessment of Submerged Cultural Resources in Hawai`i. US Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, Camarillo, CA. OCS Study BOEM 2017-021. 240 p., with appendices.

Watson TK, Hoomanawanui K, Thurman R, Thao B, Boyne K. 2017. Na 'Ikena I Kai (Seaward Viewsheds): Inventory of Terrestrial Properties for Assessment of Marine Viewsheds on the Eight Main Hawaiian Islands. US Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, Camarillo, CA. OCS Study BOEM 2017-022. 137 p., with appendices.

Van Tilburg H, Watson TK, Faria K, Hoomanawanui K, Ho-Lastiama I, Ritte W, Maly K, Nahoopii M, Horcajo K, Kaupiko K, Ball D. 2017. A Guidance Document for Characterizing Native Hawaiian Cultural Landscapes. U.S. Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, Camarillo, CA. OCS Study BOEM 2017-023. 208 p., with appendices.

In-house databases and GIS maps

Recent New Starts Through September 2017

Deepwater Atlantic Habitats II: Continued Atlantic Research and Exploration in Deepwater Ecosystems With Focus on Coral, Canyon, and Seep Communities

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/100208
National Studies List: AT-17-06
Conducted by: TDI Brooks, International, Inc.
Estimated Period of Performance: October 2017–September 2022

This study will focus on deep-sea coral, canyon, and gas seep ecosystems in the mid- and south Atlantic Ocean. The research is sponsored by the National Oceanographic Partnership Program (NOPP), with TDI-Brooks International, Inc., as the prime contractor for BOEM, and scientists from USGS and seven academic institutions participating. NOAA is providing ship and submergence facilities, data management, public outreach through the mission website, and a wide range of related educational materials and activities. The study will improve our understanding of the distribution, ecology, and underlying geological foundation of sensitive deep-sea environments within this region, and yield insights into potential marine natural hazards such as landslides and tsunamis. The project will provide baseline information needed by BOEM, USGS, and NOAA, including new scientific data to inform environmental reviews and offshore energy decisions, and new scientific understanding of the region's physical and biological resources.

Seabird and Marine Mammal Surveys Near Potential Renewable Energy Sites Offshore Central and Southern California

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/100180
National Studies List: PC-17-01
Conducted by: U.S. Geological Survey
Estimated Period of Performance: June 2017–June 2021

With recent interest from the renewable energy industry in leasing areas for wind and wave energy development offshore central and southern California, this study will provide up-to-date information on species composition, distribution, abundance, and seasonal variation of seabirds from the southern limit of the Monterey Bay National Marine Sanctuary to the U.S.-Mexico border. In addition, researchers will collect data on marine mammals that are observed opportunistically during the surveys. Data generated will be used for environmental review of conventional and renewable energy projects proposed in this area, including those under the National Environmental Policy Act and Endangered Species Act. The project will relate this new information to that collected by other surveys on this portion of the Pacific OCS over the last 40 years.

Pacific Marine Assessment Partnership for Protected Species (PacMAPPS)

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/100179
National Studies List: PC-17-04
Conducted by: National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Estimated Period of Performance: May 2017–June 2020

This study supports a multi-agency Pacific-wide strategic plan for coordinated assessment surveys of protected species (e.g., marine mammals, seabirds), including site-specific analyses relevant to BOEM areas of interest for offshore oil and gas production and proposed renewable energy facilities. Waters offshore the U.S. West Coast (California Current Ecosystem) and Hawaiian Archipelago will be surveyed to answer questions such as: Where do protected species live in the Pacific? Why do they live there and what are they doing? And what factors are important for predicting distribution and abundance of protected species?

Regional Essential Fish Habitat Geospatial Assessment and Framework of Offshore Sand Features

ESPIS Link: https://marinecadastre.gov/espis/#/search/study/100184
National Studies List: NT-16- 09
Conducted by: National Oceanic and Atmospheric Administration, National Centers for Coastal Ocean Science
Estimated Period of Performance: October 2017– September 2019

This study will address the need for regional Essential Fish Habitat (EFH) planning methodologies by developing a geospatial tool that includes regional classification of offshore sand features and associated EFH. Historically, EFH assessments have been developed on a project-by-project basis using species and habitat information specific to a borrow area. By defining and organizing spatial relationships of OCS sand resource areas and sand features important to fish habitat, BOEM will be able to improve EFH consultations and coordination with other federal agencies, such as the National Marine Fisheries Service and the US Army Corps of Engineers.

BOEM's Environmental Studies Program

develops, funds, and manages rigorous scientific research specifically to inform policy decisions on the development of energy and mineral resources on the Outer Continental Shelf (OCS).

Research covers physical oceanography, atmospheric sciences, biology, protected species, social sciences (such as economics and submerged cultural resources) and environmental fates and effects of oil and gas in the sea. Mandated by Section 20 of the Outer Continental Shelf Lands Act, the Environmental Studies Program is an indispensable requirement informing BOEM's decisions on offshore oil and gas, offshore renewable energy, and the marine minerals program for coastal restoration.

The ESP has provided over $1 billion for research to this end since 1973.

Visit our webpage @ www.boem.gov/studies/

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