

Environmental Studies Program: Ongoing Study

Title	Oil Spill Occurrence Estimators for Onshore and Offshore Crude and Refined Oil Spills on the Alaska North Slope and Cook Inlet, Alaska (AK-18-x12)
Administered by	Alaska Regional Office
BOEM Contact(s)	Dr. Heather Crowley, heather.crowley@boem.gov
Conducting Organizations(s)	Nuka Research and Planning Group, LLC
Total BOEM Cost	\$224,658
Performance Period	FY 2019–2021
Final Report Due	October 2020
Date Revised	January 22, 2021
PICOC Summary	
<i><u>Problem</u></i>	Petroleum hydrocarbon spill data for analyses, including the number, volume, and likelihood of such petroleum hydrocarbon spills, is needed to support the assessment of potential impacts under the National Environmental Policy Act (NEPA).
<i><u>Intervention</u></i>	Disparate petroleum hydrocarbon spill data will be collected into a systematic collation of data for mathematical analyses.
<i><u>Comparison</u></i>	A suite of objective methodologies will provide estimates of petroleum hydrocarbon spills needed for NEPA analyses.
<i><u>Outcome</u></i>	This project will deliver regionally specific estimates of the occurrence of small oil spills for the Beaufort and Chukchi Seas and Cook Inlet.
<i><u>Context</u></i>	Beaufort Sea, Chukchi Sea, Cook Inlet

BOEM Information Need(s): The oil-spill risk analysis is a cornerstone to BOEM Environmental Impact Statements (EISs), environmental assessments (EAs), and oil-spill-contingency planning. Oil-spill issues constitute a substantial portion of public comments submitted on lease sale or development and production EISes and exploration plan (EP) or geophysical and geological EAs in the Alaska Office. Oil spill occurrence rates specific to Alaska derived from this study will be used by Alaska Office staff to estimate small oil spill occurrence (<1,000 barrels [bbl]) in preparing NEPA documents for future Beaufort Sea, Chukchi Sea, or Cook Inlet lease sales, Exploration Plans (EPs), Development and Production Plans, and in reviewing oil-spill-contingency plans for Outer Continental Shelf (OCS) and coastal facilities.

Background: The Bureau of Ocean Energy Management (BOEM), Alaska Office uses various datasets and models to estimate the number, volume and likelihood of large ($\geq 1,000$ bbl) and small (<1,000 bbl) spills occurring. These estimates are used to evaluate potential oil spills from a proposed OCS action and derive an impact determination for NEPA analyses. The OCS spill occurrence rates used in non-Arctic BOEM NEPA analyses are based on historical Gulf of Mexico and Pacific OCS platform, pipeline, or worldwide tanker crude oil-spill rates (ABS Consulting Inc., 2016). Since

2000, the Alaska Office has incorporated Alaska North Slope spills (Robertson et al., 2013) in the analyses.

Objectives:

- Develop relative spill occurrence estimator(s) suitable for use for onshore and offshore small oil spills on the Alaska North Slope using an appropriate exposure variable.
- Develop relative spill occurrence estimator(s) suitable for use for onshore and offshore small and large oil spills in and adjacent to Cook Inlet using an appropriate exposure variable.

Methods: Investigators will conduct a preliminary meeting to discuss acceptable statistical methods in consideration of historical statistical approaches, BOEM rationales for estimating oil spill occurrence rates, and possible sources of variance. The discussion will include: methods for deriving historical spill frequencies from Alaska North Slope and Cook Inlet spill records; exposure variables for spill frequency such as pipeline miles, volume of throughput, age, and well years; implications for using different exposure variables; limitations of the spill records; and recommended standard data format for exposure variables and accident data.

The investigators will update oil spill occurrence estimates previously calculated for the North Slope (Robertson et al., 2013). They will collect, examine, and reconcile crude and refined oil spill records and cleanup reports for the North Slope for spills ≥ 1 bbl from industry, U.S. Coast Guard (USCG), Environmental Protection Agency (EPA), U.S. Department of the Interior (DOI), Bureau of Land Management (BLM), BOEM, Bureau of Safety & Environmental Enforcement (BSEE), U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (USDOT, PHMSA), and Alaska Department of Environmental Conservation (ADEC) datasets through 2019. Exposure data for Alaska North Slope will be collected and the number of wells, flow, and pipeline miles by year provided when available. The investigators will also calculate accident frequencies for small spills and perform appropriate statistical analyses, including trend analysis. Results will be collated into an electronic database in a standard format.

Similarly, the investigators will collect, examine, and reconcile crude and refined oil spill records and cleanup reports for the onshore and offshore Cook Inlet region for spills ≥ 1 bbl from industry, USCG, EPA, DOI, BLM, BOEM, BSEE, U.S. Fish & Wildlife Service, USDOT PHMSA, and ADEC data sets through 2019. Exposure data for Cook Inlet region will be collected and the number of wells, flow, and pipeline miles by year provided when available. The investigators will also calculate accident frequencies for small spills and perform appropriate statistical analyses, including trend analysis. Results will be collated into an electronic database in a standard format.

Specific Research Question(s): What are the respective frequencies of oil spills on the Alaska North Slope and Cook Inlet?

Current Status: Completed

Publications Completed: None

Affiliated WWW Sites: <http://www.boem.gov/akstudies/>

<https://marinecadastre.gov/espis/#/search/study/100240>

References:

ABS Consulting Inc., 2016. 2016 Update of Occurrence Rates for Offshore Oil Spills. Arlington VA: Prepared by ABS Consulting Inc. for USDOJ, BOEM/BSEE. 95 pp.

Robertson, T. L., Campbell, L. K., Pearson, L., and Higman, B., 2013. Oil spill occurrence rates for Alaska North Slope crude and refined oil spills. Report to Bureau of Ocean and Energy Management. OCS Study BOEM 2013-205.